

# POWER MODULES



## FEATURED PRODUCTS

- Standard Recovery Diode Modules
- Fast Recovery Diode Modules
- Schottky Modules
- Ultrafast Modules
- Thyristor Modules
- Bridge Modules
- MOSFET Modules
- IGBT Modules

## RESOURCES

- For technical support, contact [Modules@vishay.com](mailto:Modules@vishay.com)
- For further information, visit <http://www.vishay.com> and click on Modules
- Material categorization: For definitions of compliance, please see <http://www.vishay.com/doc?99912>



**RoHS**  
COMPLIANT





# POWER MODULES

## Standard Diode and Thyristor Modules

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# POWER MODULES

## Standard Diode and Thyristor Modules

Versatile and high-efficiency power diode and SCR modules from Vishay Intertechnology feature industry-standard outlines with a choice of diode and thyristor rectifiers. Offering single-rectifying/switch component, half-bridge, and center-tapped configurations, these modules are the ideal choice for input rectification applications at either low or high voltages.

Vishay modules fulfill a single or composite function within a single package that offers a thermally conductive, but electrically isolated, path to the outside circuit. This electrical isolation between the baseplate and the active semiconductors provides a key advantage over discrete components. The modules are RoHS-compliant and meet industry standards for safety, including UL approval.

State-of-the-art compression bonding (for current ratings higher than 250 A) and ultrasonic aluminum wire bonding technologies allow the modules to achieve outstanding performance. Vishay’s high-power modules are recognized throughout the world for their ruggedness, high reliability, and consistency of mechanical specifications and electrical characteristics.

### Features

- Wide range of industry-standard package styles
- Direct mounting on heatsink
- Choice of rectifier and thyristor technologies
- Optimized high-voltage diode and SCR
- Fast recovery diode modules available
- High isolation voltage (2500 V)
- RoHS-compliant
- Low thermal resistance
- Low- / high-temperature performance (-40 °C to +175 °C)
- UL approved

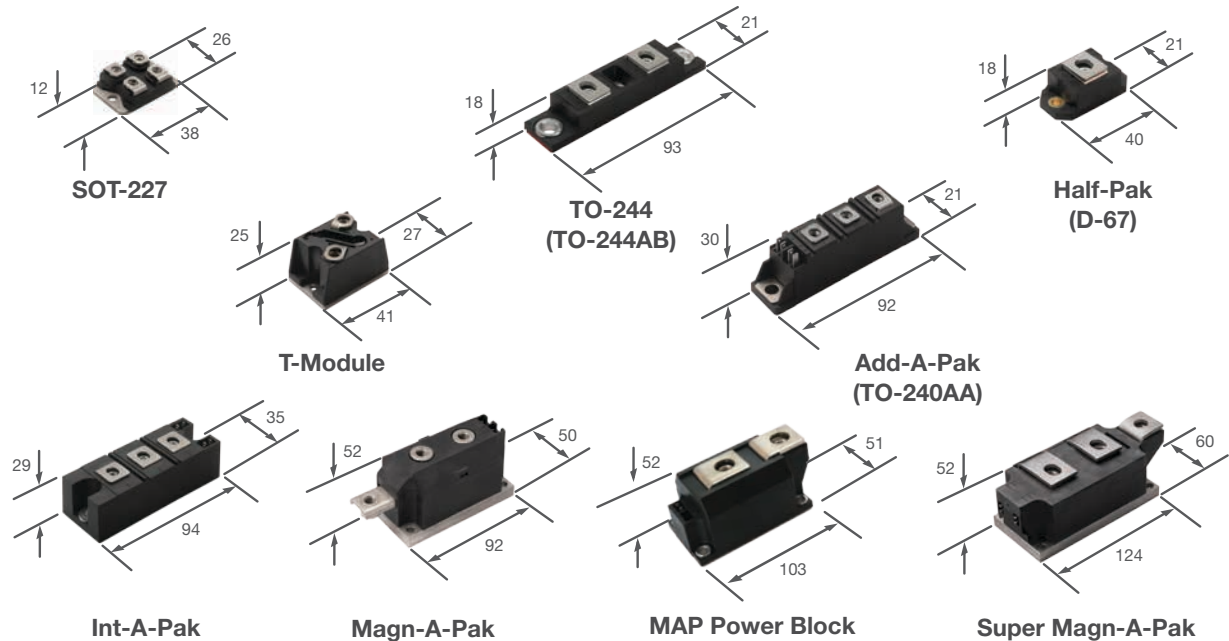
### Options

- Customizable for specific application needs
- Gate and auxiliary cathode accessories available upon request

### Applications

- Single- and three-phase input rectification
- Industrial welding
- Switch mode power supplies
- Motor drives
- UPS
- Anti-parallel thyristors (AC switches)

### Dimensions in Millimeters

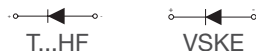




# POWER MODULES

## Standard Diode and Thyristor Modules

### Standard Recovery Diode Modules - Single



	Device <sup>(6)</sup>	Package	Pin Out	$V_{RRM}$ Range (V)	$I_{F(AV)}$ at $T_C$		Max $V_F$ at $I_F$		$I_{FSM}$ <sup>(4)</sup> (A)
					(A)	(°C)	(V)	(A)	
	<a href="#">VS-T20HF220</a>	T-Module <sup>(1)</sup>	Screwable	2200	20	72	1.3	60	380
	<a href="#">VS-T40HF10 to VS-T40HF120</a>	T-Module <sup>(1)</sup>	Screwable	100 to 1200	40	85	1.3	126	570
	<a href="#">VS-T70HF10 to VS-T70HF120</a>	T-Module <sup>(1)</sup>	Screwable	100 to 1200	70	85	1.35	220	1200
	<a href="#">VS-T85HF10 to VS-T85HF120</a>	T-Module <sup>(1)</sup>	Screwable	100 to 1200	85	85	1.27	267	1700
	<a href="#">VS-T110HF10 to VS-T110HF120</a>	T-Module <sup>(1)</sup>	Screwable	100 to 1200	110	85	1.35	345	2000
	<a href="#">VS-VSKE56/04 to VS-VSKE56/16</a>	Add-A-Pak <sup>(1)</sup> (TO-240AA)	Screwable	400 to 1600	60	114	1.6	188	1300
	<a href="#">VS-VSKE71/04 to VS-VSKE71/16</a>	Add-A-Pak <sup>(1)</sup> (TO-240AA)	Screwable	400 to 1600	80	110	1.6	251	1500
	<a href="#">VS-VSKE91/04 to VS-VSKE91/16</a>	Add-A-Pak <sup>(1)</sup> (TO-240AA)	Screwable	400 to 1600	100	112	1.55	314	2000
	<a href="#">VS-VSKE166/04PBF to VS-VSKE166/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	165	100	1.43	518	4000
	<a href="#">VS-VSKE196/04PBF to VS-VSKE196/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	195	100	1.38	612	4750
	<a href="#">VS-VSKE236/04PBF to VS-VSKE236/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	230	100	1.46	722	5500
	<a href="#">VS-VSKE250-04PBF to VS-VSKE250-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	250	100	1.29	785	7015
	<a href="#">VS-VSKE270-04PBF to VS-VSKE270-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	270	100	1.48	848	8920
	<a href="#">VS-VSKE320-04PBF to VS-VSKE320-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	320	100	1.28	1005	10110

Note:

- B. Bold indicates new product
1. Isolated package
  2. Not isolated package
  3. x = Circuit configuration. Replace "x" with any of the following letters to determine part number for each circuit configuration

D = Two diodes double circuit  
 C = Two diodes common cathode  
 J = Two diodes common anode  
 Some configurations might not be available for some packages. Contact Vishay for more information and feasibilities

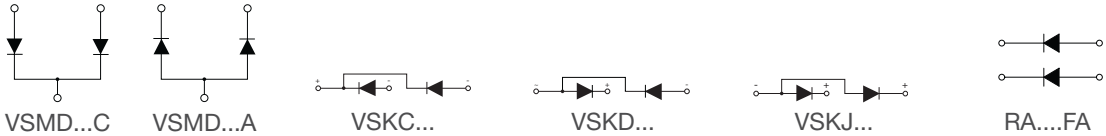
4.  $t = 10$  ms, no voltage reapplied, sinusoidal half-wave, initial  $T_j = T_j$  max



# POWER MODULES

## Standard Diode and Thyristor Modules

### Standard Recovery Diode Modules - Dual



	Device <sup>(3)</sup>	Package	Pin Out	V <sub>RRM</sub> Range (V)	I <sub>F(AV)</sub> at T <sub>C</sub>		Max V <sub>F</sub> at I <sub>F</sub>		I <sub>FSM</sub> <sup>(4)</sup> (A)
					(A)	(°C)	(V)	(A)	
	<a href="#">VS-RA160FA120</a>	SOT-227	Screwable	1200	160	101	1.27	100	940
	<a href="#">VS-RA220FA120</a>	SOT-227	Screwable	1200	220	90	1.31	110	1170
	<a href="#">VS-VSKx56/04 to VS-VSKx56/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Screwable	400 to 1600	60	114	1.6	188	1300
	<a href="#">VS-VSKx71/04 to VS-VSKx71/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Screwable	400 to 1600	80	110	1.6	251	1500
	<a href="#">VS-VSKx91/04 to VS-VSKx91/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Screwable	400 to 1600	100	112	1.55	314	2000
	<a href="#">VSMD400AW60</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Screwable	600	200	133	1.31	200	2500
	<a href="#">VSMD400CW60</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Screwable	600	200	133	1.31	200	2500
	<a href="#">VS-VSKx166/04PBF to VS-VSKx166/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	165	100	1.43	518	4000
	<a href="#">VS-VSKx196/04PBF to VS-VSKx196/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	195	100	1.38	612	4750
	<a href="#">VS-VSKx236/04PBF to VS-VSKx236/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Screwable	400 to 1600	230	100	1.46	722	5500
	<a href="#">VS-VSKx250-04PBF to VS-VSKx250-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	250	100	1.29	785	7015
	<a href="#">VS-VSKx270-04PBF to VS-VSKx270-30PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 3000	270	100	1.48	848	8920
	<a href="#">VS-VSKx320-04PBF to VS-VSKx320-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	320	100	1.28	1005	10 110
	<a href="#">VS-VSKD600-04PBF to VS-VSKD600-20PBF</a>	Super Magn-A-Pak <sup>(1)</sup>	Screwable	400 to 2000	600	100	1.45	1800	19 000

Note:  
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 2. Not isolated package  
 3. x = Circuit configuration. Replace "x" with any of the following letters to determine part number for each circuit configuration  
 D = Two diodes double circuit  
 C = Two diodes common cathode  
 J = Two diodes common anode  
 Some configurations might not be available for some packages. Contact Vishay for more information and feasibilities  
 4. t = 10 mS, no voltage reapplied, sinusoidal half-wave, initial T<sub>j</sub> = T<sub>j</sub> max



# POWER MODULES

## Standard Diode and Thyristor Modules

### Fast Recovery Diode Modules



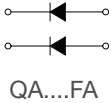
	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> Range (V)	I <sub>F(AV)</sub> at T <sub>C</sub>		Max V <sub>F</sub> at I <sub>F</sub>		Typ. t <sub>rr</sub> at 25 °C		Typ. Q <sub>rr</sub> at 125 °C
						(A)	(°C)	(V)	(A)	(ns)	setup (I <sub>F</sub> , di <sub>F</sub> / dt, V <sub>R</sub> )	(nC)
	<a href="#">VS-T40HFL20S02 to VS-T40HFL60S02</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	200 to 600	40	70	1.60	126	200	126 A, 25 A/μs, 30 V	550
	<a href="#">VS-T40HFL20S05 to VS-T40HFL100S05</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	200 to 1000	40	70	1.60	126	500	126 A, 25 A/μs, 30 V	2000
	<a href="#">VS-T70HFL20S02 to VS-T70HFL60S02</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	200 to 600	70	70	1.73	220	200	220 A, 25 A/μs, 30 V	600
	<a href="#">VS-T70HFL10S05 to VS-T70HFL100S05</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	100 to 1000	70	70	1.73	220	500	220 A, 25 A/μs, 30 V	2100
	<a href="#">VS-T85HFL10S02 to VS-T85HFL60S02</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	200 to 600	85	70	1.55	267	200	267 A, 25 A/μs, 30 V	800
	<a href="#">VS-T85HFL20S05 to VS-T85HFL100S05</a>	T-Module <sup>(1)</sup>	Fast Soft Recovery	Screwable	200 to 1000	85	70	1.55	267	500	267 A, 25 A/μs, 30 V	3500



# POWER MODULES

## Schottky Diode Modules

### Schottky TMBS® Diode Modules - Dual (Isolated)



	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
						(A)	(°C)	(V)	(A)	
	<a href="#">VS-QA250FA20</a>	SOT-227	Two Separated Diodes, Parallel Pin Out	Screwable	200	250	106	1.2	200	900
	<a href="#">VS-QA300FA17</a>	SOT-227	<b>Two Separated Diodes, Parallel Pin Out</b>	<b>Screwable</b>	<b>170</b>	<b>300</b>	<b>132</b>	<b>0.98</b>	<b>200</b>	<b>1575</b>

### Schottky Diode Modules - Single (Not Isolated)



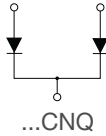
	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
						(A)	(°C)	(V)	(A)	
	<a href="#">VS-125NQ015PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	15	120	74	0.43	120	1700
	<a href="#">VS-122NQ030PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	30	120	115	0.57	120	2000
	<a href="#">VS-120NQ045PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	45	120	105	0.63	120	1550
	<a href="#">VS-121NQ045PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	45	120	137	0.65	120	2000
	<a href="#">VS-123NQ100PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	100	120	133	0.91	120	1800
	<a href="#">VS-182NQ030PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	30	180	108	0.59	180	2500
	<a href="#">VS-180NQ045PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	45	180	105	0.60	180	2400
	<a href="#">VS-183NQ100PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	100	240	128	0.91	180	2500
	<a href="#">VS-245NQ015PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	15	240	73	0.52	240	3000
	<a href="#">VS-242NQ030PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	30	240	118	0.54	240	3000
	<a href="#">VS-240NQ045PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	45	240	104	0.72	240	3400
	<a href="#">VS-241NQ045PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	45	240	144	0.8	240	3450
	<a href="#">VS-243NQ100PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	100	240	132	0.95	240	3300
<a href="#">VS-249NQ150PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	150	240	121	1.21	240	2300	

Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package  
 3. Per module  
 4. T<sub>J</sub> = 25 °C  
 5. 10 ms sine pulse, no voltage reapplied

# POWER MODULES

## Schottky Diode Modules

### Schottky Diode Modules - Dual (Not Isolated)



Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
					(A)	(°C)	(V)	(A)	
<a href="#">VS-220CNQ030PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	30	220	122	0.59	220	1950
<a href="#">VS-200CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	200	116	0.73	200	1550
<a href="#">VS-201CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	200	146	0.81	200	2000
<a href="#">VS-203CNQ100PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	100	200	142	1.03	200	1700
<a href="#">VS-209CNQ135PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	135	200	131	1.33	200	1200
<a href="#">VS-209CNQ150PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	150	200	131	1.33	200	1200
<a href="#">VS-300CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	300	111	0.77	300	2400
<a href="#">VS-301CNQ040PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	40	300	132	0.9	300	3200
<a href="#">VS-301CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	300	132	0.9	300	3200
<a href="#">VS-303CNQ100PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	100	300	138	1.09	300	2500
<a href="#">VS-401CNQ040PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	40	400	114	0.73	400	3400
<a href="#">VS-400CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	400	114	0.73	400	3400
<a href="#">VS-401CNQ045PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	45	400	147	0.78	400	3450
<a href="#">VS-403CNQ100PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	100	400	141	1.07	400	3300
<a href="#">VS-409CNQ135PBF</a>	T0-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	135	400	129	1.46	400	2300

Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package

3. Per module  
 4. T<sub>j</sub> = 25 °C  
 5. 10 ms sine pulse, no voltage reapplied






# POWER MODULES

## Schottky Diode Modules

Schottky Diode Modules - Dual (Not Isolated), continued

	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
						(A)	(°C)	(V)	(A)	
	<a href="#">VS-409CNQ150PBF</a>	T0-244 (T0-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	150	400	129	1.46	400	2300
	<a href="#">VS-440CNQ030PBF</a>	T0-244 (T0-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	30	440	125	0.63	440	3000

Note:

B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package

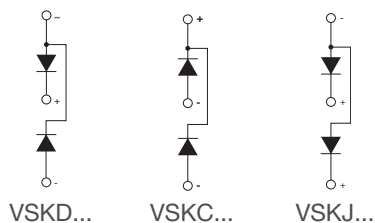
3. Per module  
 4. T<sub>j</sub> = 25 °C  
 5. 10 ms sine pulse, no voltage reapplied



# POWER MODULES

## Schottky Diode Modules

### Schottky Diode Modules - Dual (Isolated)



Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
					(A)	(°C)	(V)	(A)	
<a href="#">VS-VSKDS201/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	45	200	123	1.04	200	1850
<a href="#">VS-VSKCS201/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	45	200	123	1.04	200	1850
<a href="#">VS-VSKDS203/100</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	100	200	121	1.34	200	1700
<a href="#">VS-VSKCS203/100</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	100	200	121	1.34	200	1700
<a href="#">VS-VSKJS203/100</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Anode)	Screwable	100	200	121	1.34	200	1700
<a href="#">VS-VSKDS209/150</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	150	200	113	1.35	200	1600
<a href="#">VS-VSKCS209/150</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	150	200	113	1.35	200	1600
<a href="#">VS-VSKJS209/150</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Anode)	Screwable	150	200	113	1.35	200	1600
<a href="#">VS-VSKDS220/030</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	30	220	110	0.78	220	2000
<a href="#">VS-VSKCS220/030</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	30	220	110	0.78	220	2000
<a href="#">VS-VSKDS400/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	45	400	91	0.92	400	3400
<a href="#">VS-VSKCS400/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	45	400	91	0.92	400	3400
<a href="#">VS-VSKDS401/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	45	400	120	0.98	400	3450
<a href="#">VS-VSKCS401/045</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	45	400	120	0.98	400	3450

Note:

B. Bold indicates new product

1. Isolated package

2. Not isolated package

3. Per module

4. T<sub>J</sub> = 25 °C


5. 10 ms sine pulse, no voltage reapplied



# POWER MODULES

## Schottky Diode Modules

Schottky Diode Modules - Dual (Isolated), continued

	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup>
						(A)	(°C)	(V)	(A)	(A)
	<a href="#">VS-VSKDS408/060</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	60	400	102	1.09	400	3300
	<a href="#">VS-VSKCS408/060</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	60	400	102	1.09	400	3300
	<a href="#">VS-VSKDS403/100</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	100	400	111	1.3	400	3300
	<a href="#">VS-VSKCS403/100</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	100	400	111	1.30	400	3300
	<a href="#">VS-VSKDS409/150</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	150	400	105	1.33	400	2300
	<a href="#">VS-VSKCS440/030</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Cathode)	Screwable	30	440	97	1.00	440	3000
	<a href="#">VS-VSKJS440/030</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Dual Diode (Common Anode)	Screwable	30	440	97	1.00	440	3000

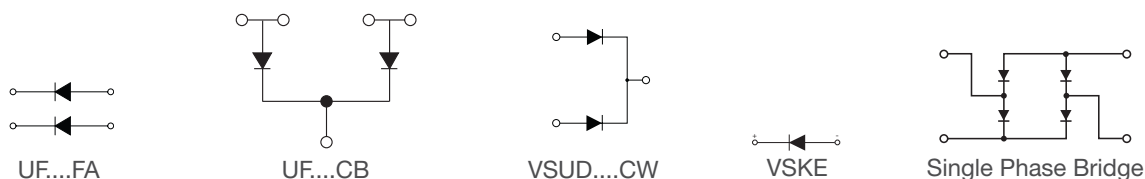
Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package

3. Per module  
 4. T<sub>J</sub> = 25 °C  
 5. 10 ms sine pulse, no voltage reapplied



# POWER MODULES

## Ultrafast Recovery Diode Modules



### Ultrafast Diode Modules - FRED Pt®

Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		Typ. t <sub>rr</sub> at 25 °C (ns)	Typ. Q <sub>rr</sub> at 125 °C	
					(A)	(°C)	(V)	(A)		setup (I <sub>F</sub> , di <sub>F</sub> / dt, V <sub>R</sub> )	(nC)
					<a href="#">VS-UFH60BA65</a>	SOT-227 <sup>(1)</sup>	Single-phase Bridge	Screwable		650	60 (Bridge I <sub>o</sub> )
<a href="#">VS-UFH280FA30</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	300	280	81	1.27	100	58	50A, 200A/us, 200V	429
<a href="#">VS-UFB80FA20</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	200	80	129	1.08	30	34	30 A, 200 A/μs, 100 V	184
<a href="#">VS-UFB80FA40</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	400	80	121	1.39	30	68	30 A, 200 A/μs, 200 V	900
<a href="#">VS-UFB80FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	80	104	1.69	30	79	30 A, 200 A/μs, 200 V	1085
<a href="#">VS-UFL80FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	80	115	1.43	30	115	30 A, 200 A/μs, 200 V	1900
<a href="#">VS-UFB130FA20</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	200	130	126	1.13	60	42	50 A, 200 A/μs, 100 V	295
<a href="#">VS-UFB130FA40</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	400	130	114	1.37	60	86	50 A, 200 A/μs, 200 V	1400
<a href="#">VS-UFB130FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	130	92	1.80	60	79	50 A, 200 A/μs, 200 V	1220
<a href="#">VS-UFL130FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	130	98	1.60	60	105	50 A, 200 A/μs, 200 V	1850
<a href="#">VS-UFB170FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	170	76	1.43	100	220	50 A, 500 A/us, 200 V	9100
<a href="#">VS-UFB201FA40</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	400	200	86	1.28	100	80	50 A, 200 A/μs, 200 V	1300

Note:

B. Bold indicates new product  
1. Isolated package

2. Not isolated package  
3. Per module




4. T<sub>j</sub> = 25 °C  
5. Very low thermal resistance



# POWER MODULES

## Ultrafast Recovery Diode Modules

Ultrafast Diode Modules - FRED Pt®, continued

	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		Typ. t <sub>rr</sub> at 25 °C		Typ. Q <sub>rr</sub> at 125 °C
						(A)	(°C)	(V)	(A)	(ns)	setup (I <sub>F</sub> , di <sub>F</sub> / dt, V <sub>R</sub> )	(nC)
	<a href="#">VS-UFB280FA20</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	200	280	100	1.10	120	34	150 A, 200 A/μs, 160 V	300
	<a href="#">VS-UFB280FA40</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	400	280	90	1.24	100	93	150 A, 200 A/μs, 200 V	1740
	<a href="#">VS-UFB211FA40</a>	SOT-227	Two Separated Diodes, Parallel Pin Out	Screwable	400	210	133	1.24	100	93	150 A, 200 A/μs, 200 V	1740
	<a href="#">VS-UFB230FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	230	88	1.78	100	83	50 A, 200 A/μs, 200 V	1595
	<a href="#">VS-UFL230FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	230	102	1.44	100	104	50 A, 200 A/μs, 200 V	2200
	<a href="#">VS-UFB250FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	250	113	1.19	100	166	50 A, 500 A/μs, 200 V	10 000 (150 °C)
	<a href="#">VS-UFB310CB40</a>	SOT-227 <sup>(2)</sup>	Not isolated: two separated diodes, common cathode	Screwable	400	310	119	1.34	100	89	50 A, 200 A/μs, 200 V	1840
	<a href="#">VS-UFL250CB60</a>	SOT-227 <sup>(2)</sup>	Not isolated: two separated diodes, common cathode	Screwable	600	250	119	1.44	100	104	50 A, 200 A/μs, 200 V	2200
	<a href="#">VS-VSUD360CW40</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	400	360	116	1.50	360	74	180 A, 200 A/μs, 200 V	1295 (150 °C)
	<a href="#">VS-VSUD400CW60</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	400	97	2.30	400	90	200 A, 200 A/μs, 200 V	4730
	<a href="#">VS-VSUD405CW60</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	400	132	1.72	400	124	50 A, 500 A/μs, 200 V	5000
	<a href="#">VS-VSUD410CW60</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	400	85	1.37	400	215	50 A, 500 A/μs, 200 V	15100
	<a href="#">VS-VSKEF500/06PBF</a>	Int-A-Pak <sup>(1)</sup>	Single Diode	Screwable	600	519	90	1.66	500	104	50 A, 500 A/μs, 200 V	13800

Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package

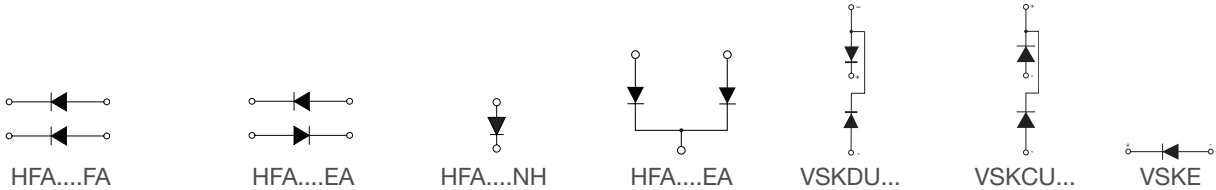
3. Per module  
 4. T<sub>J</sub> = 25 °C  
 5. Very low thermal resistance



# POWER MODULES

## Ultrafast Recovery Diode Modules

### Ultrafast Diode Modules - HEXFRED®



Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		Typ. t <sub>rr</sub> at 25 °C (ns)	Typ. Q <sub>rr</sub> at 125 °C	
					(A)	(°C)	(V)	(A)		setup (I <sub>F</sub> , di <sub>F</sub> / dt, V <sub>R</sub> )	(nC)
<a href="#">VS-HFA70FA120</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	1200	70	94	3.80	60	134	50 A, 200 A/μs, 200 V	1770
<a href="#">VS-HFA70EA120</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Anti-Parallel Pin Out	Screwable	1200	70	121	4.00	60	145	50 A, 200 A/μs, 200 V	1920
<a href="#">VS-HFA90FA120</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	1200	90	63	3.30	40	80	50 A, 200 A/μs, 200 V	740
<a href="#">VS-HFA140FA60</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	600	140	110	2.04	120	90	50 A, 200 A/μs, 200 V	1180
<a href="#">VS-HFA140FA120</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	1200	140	74	5.03	120	145	50 A, 200 A/μs, 200 V	1920
<a href="#">VS-HFA220FA120</a>	SOT-227 <sup>(1)</sup>	Two Separated Diodes, Parallel Pin Out	Screwable	1200	220	68	4.70	200	157	50 A, 200 A/μs, 200 V	2850
<a href="#">VS-HFA90NH40PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	400	106	100	1.45	90	90	90 A, 200 A/μs, 200 V	1200
<a href="#">VS-HFA135NH40PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	400	138	100	1.65	135	77	135 A, 200 A/μs, 200 V	2800
<a href="#">VS-HFA180NH40PBF</a>	Half-Pak (D-67) <sup>(2)</sup>	Single Diode (Cathode to Base)	Screwable	400	200	100	1.46	180	90	135 A, 200 A/μs, 200 V	2650
<a href="#">VS-HFA140NJ60CPBF</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	168	100	2.10	140	80	70 A, 200 A/μs, 200 V	980
<a href="#">VS-HFA210NJ60CPBF</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	240	100	2.25	210	90	105 A, 200 A/μs, 200 V	1200
<a href="#">VS-HFA240NJ40CPBF</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	400	394	100	1.50	240	77	140 A, 200 A/μs, 200 V	2300
<a href="#">VS-HFA280NJ60CPBF</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	600	298	100	2.10	210	92	105 A, 200 A/μs, 200 V	1400



Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package  
 3. Per module  
 4. T<sub>i</sub> = 25 °C  
 5. Very low thermal resistance



# POWER MODULES

## Ultrafast Recovery Diode Modules

Ultrafast Diode Modules - HEXFRED<sup>®</sup>, continued

	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		Typ. t <sub>rr</sub> at 25 °C		Typ. Q <sub>rr</sub> at 125 °C
						(A)	(°C)	(V)	(A)	(ns)	setup (I <sub>F</sub> , di <sub>F</sub> / dt, V <sub>R</sub> )	(nC)
	<a href="#">VS-HFA320NJ40CPBF</a>	TO-244 (TO-244AB) <sup>(2)</sup>	Dual Diode (Common Cathode)	Screwable	400	320	115	1.54	320	90	160 A, 200 A/μs, 200 V	2600
	<a href="#">VS-VSKDU162/12PBF</a>	Int-A-Pak <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	1200	110	100	3.90	160	150	160 A, 200A/μs, 200 V	2000 (25°C)
	<a href="#">VS-VSKCU300/06PBF</a>	Int-A-Pak <sup>(1)</sup>	Two Diodes Common Cathode	Screwable	600	230	100	1.96	300	130	50 A, 200 A/μs, 400 V	1800
	<a href="#">VS-VSKDU300/06PBF</a>	Int-A-Pak <sup>(1)</sup>	Two Diodes Doubler Circuit	Screwable	600	230	100	1.96	300	130	50 A, 200 A/μs, 400 V	1800
	<a href="#">VS-VSKEU300/12PBF</a>	Int-A-Pak <sup>(1)</sup>	Single Diode	Screwable	1200	300	60	2.23	300	233	50 A, 500 A/μs, 200 V	10400

Note:

- B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package

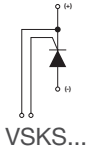
3. Per module  
 4. T<sub>J</sub> = 25 °C  
 5. Very low thermal resistance



# POWER MODULES

## Thyristor Modules

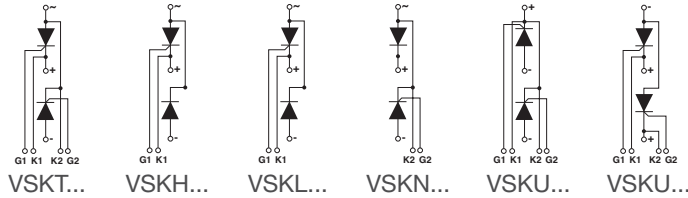
### Thyristor Modules - Single



	Device <sup>(B)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>C</sub>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(3)</sup>		I <sub>FSM</sub> <sup>(4)</sup> (A)
						(A)	(°C)	(V)	(A)	
	<a href="#">VS-VSKS500/08PbF</a>	MAP Power Block <sup>(1)</sup>	Single Thyristor	Screwable	800	500	76	1.1	500	16 646

Note:  
 B. Bold indicates new product  
 1. Isolated package  
 2. Not isolated package  
 3. T<sub>j</sub> = 25 °C  
 4. t = 10 mS, no voltage reapplied, sinusoidal half-wave, initial T<sub>j</sub> = T<sub>j</sub> max  
 5. Under development



**Thyristor Modules - Dual**


Device <sup>(B)(3)</sup>	Package	Type	Pin Out	$V_{RRM}$ (V)	$I_F(AV)$ at $T_C$		Max. $V_F$ at $I_F$ <sup>(4)</sup>		$I_{FSM}$ <sup>(5)</sup> (A)
					(A)	(°C)	(V)	(A)	
<a href="#">VS-VSKx26/04 to VS-VSKx26/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	27	85	1.65	85	400
<a href="#">VS-VSKx41/04 to VS-VSKx41/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	45	85	1.81	141	850
<a href="#">VS-VSKx41/04 to VS-VSKx41/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Common Anode (Cathode)	Screwable	400 to 1600	45	85	1.81	141	850
<a href="#">VS-VSKx56/04 to VS-VSKx56/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	60	85	1.70	188	1200
<a href="#">VS-VSKx56/04 to VS-VSKx56/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Common Anode (Cathode)	Screwable	400 to 1600	60	85	1.70	188	1200
<a href="#">VS-VSKx71/04 to VS-VSKx71/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	75	85	1.72	236	1300
<a href="#">VS-VSKx71/04 to VS-VSKx71/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Common Anode (Cathode)	Screwable	400 to 1600	75	85	1.72	236	1300
<a href="#">VS-VSKx91/04 to VS-VSKx91/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	95	85	1.73	298	2000
<a href="#">VS-VSKx91/04 to VS-VSKx91/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Common Anode (Cathode)	Screwable	400 to 1600	95	85	1.73	298	2000

**Note:**

B. Bold indicates new product

1. Isolated package

2. Not isolated package

3. x = circuit configuration. Replace "x" with any of the following letters to determine part number for each circuit configuration.

– Thyristor/diode and thyristor/thyristor half-bridge configurations: T = half-bridge fully controlled; h = half-bridge positive controlled; L = half-bridge negative controlled; n = half-bridge, half-controlled common anode

– common anode or common cathode configuration: U = Dual ScR common cathode; V = Dual ScR common anode

Some configurations might not be available for some packages. Contact Vishay for more information and feasibilities.

 4.  $T_j = 25\text{ °C}$ 

 5.  $t = 10\text{ mS}$ , no voltage reapplied, sinusoidal half-wave, initial  $T_j = T_j\text{ max}$

## Thyristor Modules - Dual, continued

	Device <sup>(B)(3)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup> (A)
						(A)	(°C)	(V)	(A)	
	<a href="#">VS-VSKx105/04 to VS-VSKx105/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	105	85	1.80	330	2000
	<a href="#">VS-VSKx105/04 to VS-VSKx105/16</a>	Add-A-Pak (TO-240AA) <sup>(1)</sup>	Common Anode (Cathode)	Screwable	400 to 1600	105	85	1.80	330	2000
	<a href="#">VS-VSKx136/04PBF to VS-VSKx136/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	135	85	1.57	424	3200
	<a href="#">VS-VSKx142/04PBF to VS-VSKx142/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	140	85	1.55	440	4500
	<a href="#">VS-VSKx162/04PBF to VS-VSKx162/16PBF</a>	Int-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	160	85	1.54	502	4870
	<a href="#">VS-VSKx170-04PBF to VS-VSKx170-16PBF</a>	Magn-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 1600	170	85	1.60	534	5100
	<a href="#">VS-VSKx230-04PBF to VS-VSKx230-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 2000	230	85	1.59	722	7500
	<a href="#">VS-VSKV230-08PBF</a>	Magn-A-Pak <sup>(1)</sup>	Common Anode	Screwable	800	230	85	1.59	722	7500
	<a href="#">VS-VSKx250-04PBF to VS-VSKx250-20PBF</a>	Magn-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	400 to 2000	250	85	1.44	785	8500
	<a href="#">VS-VSKT320-08PBF to VS-VSKT320-16PBF</a>	Magn-A-Pak <sup>(1)</sup>	Thyristor/Thyristor Half-Bridge	Screwable	800 to 1600	320	70	1.37	1005	9000

## Note:

B. Bold indicates new product

1. Isolated package

2. Not isolated package

3. x = circuit configuration. Replace "x" with any of the following letters to determine part number for each circuit configuration.

– Thyristor/diode and thyristor/thyristor half-bridge configurations: T = half-bridge fully controlled; h = half-bridge positive controlled; L = half-bridge negative controlled; n = half-bridge, half-controlled common anode

– common anode or common cathode configuration: U = Dual ScR common cathode; V = Dual ScR common anode

Some configurations might not be available for some packages. Contact Vishay for more information and feasibilities.

 4. T<sub>j</sub> = 25 °C


 5. t = 10 mS, no voltage reapplied, sinusoidal half-wave, initial T<sub>j</sub> = T<sub>j</sub> max



# POWER MODULES

## Thyristor Modules

Thyristor Modules - Dual, continued

	Device <sup>(B)(3)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		I <sub>FSM</sub> <sup>(5)</sup>
						(A)	(°C)	(V)	(A)	(A)
	<a href="#">VS-VSKx430-16PBF to VS-VSKx430-20PBF</a>	Super Magn-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	1600 to 2000	430	82	1.65	1350	15 700
	<a href="#">VS-VSKx500-08PBF to VS-VSKx500-16PBF</a>	Super Magn-A-Pak <sup>(1)</sup>	Thyristor/Diode and Thyristor/Thyristor Half-Bridge	Screwable	800 to 1600	500	82	1.50	1570	17 800
	<a href="#">VS-VSKT570-16PBF</a>	Super Magn-A-Pak <sup>(1)</sup>	Thyristor/Thyristor Half-Bridge	Screwable	1600	570	85	1.36	1500	18 800
	<a href="#">VS-VSKT570-18PBF</a>	Super Magn-A-Pak <sup>(1)</sup>	Thyristor/Thyristor Half-Bridge	Screwable	1800	570	74	1.50	1790	17 800

Note:

B. Bold indicates new product

1. Isolated package

2. Not isolated package

3. x = circuit configuration. Replace "x" with any of the following letters to determine part number for each circuit configuration.

– Thyristor/diode and thyristor/thyristor half-bridge configurations: T = half-bridge fully controlled; h = half-bridge positive controlled; L = half-bridge negative controlled; n = half-bridge, half-controlled common anode

– common anode or common cathode configuration: U = Dual ScR common cathode; V = Dual ScR common anode

Some configurations might not be available for some packages. Contact Vishay for more information and feasibilities.

4. T<sub>j</sub> = 25 °C

5. t = 10 mS, no voltage reapplied, sinusoidal half-wave, initial T<sub>j</sub> = T<sub>j</sub> max



# POWER MODULES

## Bridge Rectifier Modules

Versatile and high-efficiency bridge modules from Vishay Intertechnology feature industry-standard outlines with a choice of single-phase and three-phase rectifying bridges. The modules are the ideal choice for input rectification applications at either low or high voltages, with the electrical isolation between the baseplate and the active semiconductors providing a key advantage over discrete components. External electrical connections are provided with a choice of different terminal option, including fast-on, solderable pins, and bolt-down.

Vishay high-power bridge modules are RoHS-compliant and meet industry standards for safety, including UL approval. The devices are recognized throughout the world for their ruggedness, high reliability, and consistency of mechanical specifications and electrical characteristics.

### Features

- Wide range of package styles and configurations with diode and / or thyristor technologies
- Direct mounting on heatsink
- Compact case styles for screw, solderable pin, and fast-on plug terminations
- PressFit pins NOW available on MTP package
- High isolation voltage: up to 4000 V
- RoHS-compliant
- Low thermal resistance
- UL approval
- High surge current: up to 1880 A
- Fast and ultrafast bridges available

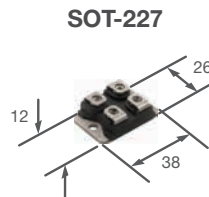
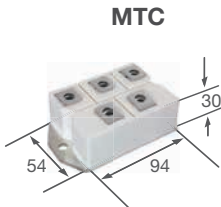
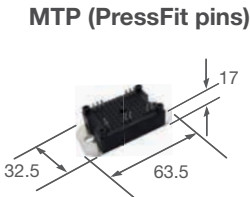
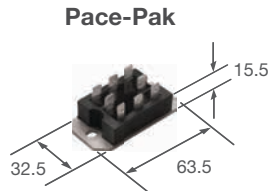
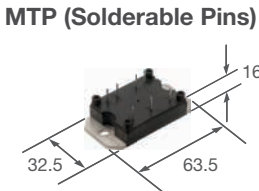
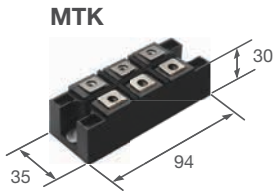
### Options

- Customizable for specific application needs
- Temperature sensor available in some package styles

### Applications

- Single- and three-phase input rectification
- EV charging stations (high frequency output rectification)

### Dimensions in Millimeters





# POWER MODULES

## Bridge Rectifier Modules

### Bridge Rectifier Modules (Standard Recovery)

Device <sup>(1)</sup>	Package	Type	I <sub>o</sub>	V <sub>(BR)</sub> Range (V)	Max. V <sub>F</sub> at I <sub>F</sub> <sup>(2)</sup>	
					(V)	(A)
<a href="#">VS-40MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	40	1600	2.0	100
<a href="#">VS-53MT80KPBF to VS-53MT160KPBF</a>	MTK (Screwable)	Full-Controlled Three-Phase Bridge	55	800 to 1600	2.68	150
<a href="#">VS-51MT80KPBF to VS-51MT160KPBF</a>	MTK (Screwable)	Negative Half-Controlled Three-Phase Bridge	55	800 to 1600	2.68	150
<a href="#">VS-52MT80KPBF to VS-52MT160KPBF</a>	MTK (Screwable)	Positive Half-Controlled Three-Phase Bridge	55	800 to 1600	2.68	150
<a href="#">VS-60MT80KPBF to VS-60MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	60	800 to 1600	1.75	100
<a href="#">VS-70MT80KPBF to VS-70MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	70	800 to 1600	1.6	100
<a href="#">VS-93MT80KPBF to VS-93MT160KPBF</a>	MTK (Screwable)	Full-Controlled Three-Phase Bridge	90	800 to 1600	1.65	150
<a href="#">VS-113MT80KPBF to VS-113MT160KPBF</a>	MTK (Screwable)	Full-Controlled Three-Phase Bridge	90	800 to 1600	1.57	150
<a href="#">VS-91MT80KPBF to VS-91MT160KPBF</a>	MTK (Screwable)	Negative Half-Controlled Three-Phase Bridge	90	800 to 1600	1.65	150
<a href="#">VS-111MT80KPBF to VS-111MT160KPBF</a>	MTK (Screwable)	Negative Half-Controlled Three-Phase Bridge	90	800 to 1600	1.57	150
<a href="#">VS-92MT80KPBF to VS-92MT160KPBF</a>	MTK (Screwable)	Positive Half-Controlled Three-Phase Bridge	90	800 to 1600	1.65	150
<a href="#">VS-112MT80KPBF to VS-112MT160KPBF</a>	MTK (Screwable)	Positive Half-Controlled Three-Phase Bridge	90	800 to 1600	1.57	150
<a href="#">VS-90MT80KPBF to VS-90MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	90	800 to 1600	1.6	150
<a href="#">VS-104MT80KPBF to VS-104MT160KPBF</a>	MTK (Screwable)	Three-Phase AC Switch	100	800 to 1600	1.53	150
<a href="#">VS-110MT80KPBF to VS-110MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	110	800 to 1600	1.4	150
<a href="#">VS-130MT80KPBF to VS-130MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	130	800 to 1600	1.63	200
<a href="#">VS-160MT80KPBF to VS-160MT160KPBF</a>	MTK (Screwable)	Three-Phase Bridge	160	800 to 1600	1.49	200



Note:

1. Bold indicates new product
2. V<sub>F</sub> limits are per diode
3. Voltage suppressor available (identified by suffix "K")

4. With both voltage suppression and freewheeling diode available (identified by suffix "KW")



# POWER MODULES

## Bridge Rectifier Modules

Bridge Rectifier Modules (Standard Recovery), continued

	Device <sup>(1)</sup>	Package	Type	I <sub>o</sub>	V <sub>(BR)</sub> Range (V)	Max. V <sub>F</sub> at I <sub>F</sub> <sup>(2)</sup>	
						(V)	(A)
	<a href="#">VS-200MT40KPBF</a>	MTK (Screwable)	Three-Phase Bridge	200	400	1.4	200
	<a href="#">VS-130MT160C and VS-130MT180C</a>	MTC	Three-Phase Bridge	130	1600 to 1800	2.05	300
	<a href="#">VS-160MT160C and VS-160MT180C</a>	MTC	Three-Phase Bridge	160	1600 to 1800	1.85	300
	<a href="#">VS-300MT160C and VS-300MT180C</a>	MTC	Three-Phase Bridge	300	1600 to 1800	1.70	300
	<a href="#">VS-40MT160PBPBF and VS-40MT160PAPBF</a>	MTP Solderable Pins	Three-Phase Bridge	45	1600	1.45	40
	<a href="#">VS-70MT160PBPBF and VS-70MT160PAPBF</a>	MTP Solderable Pins	Three-Phase Bridge	75	1600	1.45	70
	<a href="#">VS-100MT160PBPBF and VS-100MT160PAPBF</a>	MTP Solderable Pins	Three-Phase Bridge	75	1600	1.51	100
	<a href="#">VS-40MT160P-P</a>	MTP (PressFit Pins)	Three-Phase Bridge	45	1600	1.45	40
	<a href="#">VS-70MT160P-P</a>	MTP (PressFit Pins)	Three-Phase Bridge	75	1600	1.45	70
	<a href="#">VS-100MT160P-P</a>	MTP (PressFit Pins)	Three-Phase Bridge	100	1600	1.51	100
	<a href="#">VS-P101 to P105<sup>(3)(4)</sup></a>	PACE-PAK (D-19)	Single-Phase Semi-Controlled Bridge Common Cathode	25	400 to 1200	1.35	79
	<a href="#">VS-P131 to P135</a>	PACE-PAK (D-19)	Single-Phase Fully-Controlled Bridge	25	400 to 1200	1.35	79
	<a href="#">VS-P121 to P125</a>	PACE-PAK (D-19)	Single-Phase Semi-Controlled Bridge Doubler	25	400 to 1200	1.35	79
	<a href="#">VS-P431 to P435</a>	PACE-PAK (D-19)	Single-Phase Fully-Controlled Bridge	40	400 to 1200	1.4	126
	<a href="#">VS-P421 to P425</a>	PACE-PAK (D-19)	Single-Phase Semi-Controlled Bridge Doubler	40	400 to 1200	1.4	126
	<a href="#">VS-P401 to P405<sup>(3)(4)</sup></a>	PACE-PAK (D-19)	Single-Phase Semi-Controlled Bridge Common Cathode	40	400 to 1200	1.4	126

Note:

1. Bold indicates new product

2. V<sub>F</sub> limits are per diode

3. Voltage suppressor available (identified by suffix "K")


4. With both voltage suppression and freewheeling diode available (identified by suffix "KW")



# POWER MODULES

## Bridge Rectifier Modules

### Bridge Rectifier Modules (Fast and Ultrafast Recovery)

	Device <sup>(1)</sup>	Package	Type	Pin Out	V <sub>RRM</sub> (V)	I <sub>F(AV)</sub> at T <sub>c</sub> <sup>(3)</sup>		Max. V <sub>F</sub> at I <sub>F</sub> <sup>(4)</sup>		Typ t <sub>rr</sub> at 25°C		Typ Q <sub>rr</sub> at 125°C
						(A)	(°C)	(V)	(A)	(ns)	setup (I <sub>F</sub> , di <sub>F</sub> /dt, V <sub>R</sub> )	(nC)
	<a href="#">VS-UFH60BA65</a>	SOT-227 <sup>(1)</sup>	Single-phase Bridge	Screwable	650	60 (Bridge I <sub>0</sub> )	123	2.35	60	63	50A, 200A/us, 200V	765
	<a href="#">VS-SA61BA60</a>	SOT-227 <sup>(1)</sup>	Single-phase Bridge	Screwable	600	61 (Bridge I <sub>0</sub> )	57	1.33	30	170	20A, 100A/us, 30V	1970

Note:  
 1. Bold indicates new product  
 2. V<sub>F</sub> limits are per diode  
 3. Voltage suppressor available (identified by suffix "K")

4. With both voltage suppression and freewheeling diode available (identified by suffix "KW")



# POWER MODULES

## MOSFET Modules

Configured as single switches and choppers, Vishay's new power MOSFET modules are ideal for efficiently managing very high currents in low voltage power converters.

Offered in the SOT-227 package, the modules feature n-channel MOSFETs with voltage ratings of 100 V to 500 V and current ratings of 40 A to 435 A.

### Features

- Electrically isolated baseplate
- Wide current range: 40 A to 435 A
- Voltage up to 500 V
- New generation provides lower thermal resistance
- Low  $Q_g$  /  $R_{DS(on)}$  FOM helps reduce switching losses
- Fully characterized capacitance and avalanche SOA
- Low capacitance
- UL and RoHS compliant (completely lead (Pb)-free)

### Benefits

- Easy to use and run in parallel
- Low profile package
- Low thermal resistance allows operation at higher case temperatures while maintaining the operating junction temperature within safe limits
- Enhanced body diode for high  $dV/dt$  and high  $di/dt$
- Avalanche rugged
- Easy to drive

### Applications

- Industrial power supplies
- Choppers
- Forklifts
- Battery chargers
- SMPS (switch mode power supplies)
- Synchronous rectification
- Temperature controls
- Welding
- UPS
- Motor drives
- Solid-state laser power supplies






# POWER MODULES

## MOSFET Modules

### MOSFET Modules

	Device <sup>(1)</sup>	Package	Type	V <sub>DSS</sub> (V)	I <sub>D</sub> at T <sub>C</sub>		R <sub>DS(ON)</sub> (V <sub>GS</sub> = 10V) (mΩ)	Q <sub>G</sub> (nC)
					(A)	(°C)		
	<a href="#">VS-FC420SA10</a>	SOT-227	Single Switch	100	435	25	1.3	375
	<a href="#">VS-FC420SA15</a>	SOT-227	Single Switch	150	500	25	1.93	250
	<a href="#">VS-FC270SA20</a>	SOT-227	Single Switch	200	287	25	3.3	250
	<a href="#">VS-FC80NA20</a>	SOT-227	High Side Chopper	200	108	25	9.6	161
	<a href="#">VS-FA40SA50LC</a>	SOT-227	Single Switch	500	40	25	106	280
	<a href="#">VS-FA72SA50LC</a>	SOT-227	Single Switch	500	72	25	61.5	225

High-efficiency IGBT modules from Vishay Intertechnology feature industry-standard outlines with a choice of PT, NPT, and Trench IGBT technologies. Configured as single switches, inverters, choppers, half-bridges, or in custom configurations, these modules are the ideal choice for high-frequency power applications that demand high-efficiency performance. They are designed for use as a main switching device in switch mode power supplies, uninterruptible power supplies, industrial welding, motor drives, and power factor correction systems. Typical applications include boost and buck converters, forward and double forward converters, half bridges, full bridges (H-bridge), and three-phase bridges. Low thermal resistance allows Vishay IGBT modules to operate at higher case temperatures while maintaining the operating junction temperature within safe limits. Electrically isolated from the circuit, the base plate is exposed, allowing for direct mounting to the heat sink. With improved current sharing and lower operating junction temperatures, designers can now achieve higher system reliability. Vishay IGBT modules are RoHS-compliant and meet industry standards for safety including UL approval.

### Features

- Wide range of industry-standard package styles
- Direct mount on heat sink
- Choice of PT, NPT, and Trench IGBT technologies
- Low- $V_{CE(on)}$  IGBT
- Switching frequency from 1 kHz to 150 kHz
- Optimized anti-parallel ultrafast diode with soft recovery characteristics
- Rugged transient performance
- High isolation voltage up to 3500 V
- 100 % lead (Pb)-free and RoHS-compliant
- Low thermal resistance
- Wide operating temperature range (-40 °C to +175 °C)
- UL-approved
- PressFit pins technology now available on selected packages
- Gradually introducing modules using proprietary Vishay 600 V and 650 V IGBT silicon (Trench PT and Trench Field-Stop technologies)

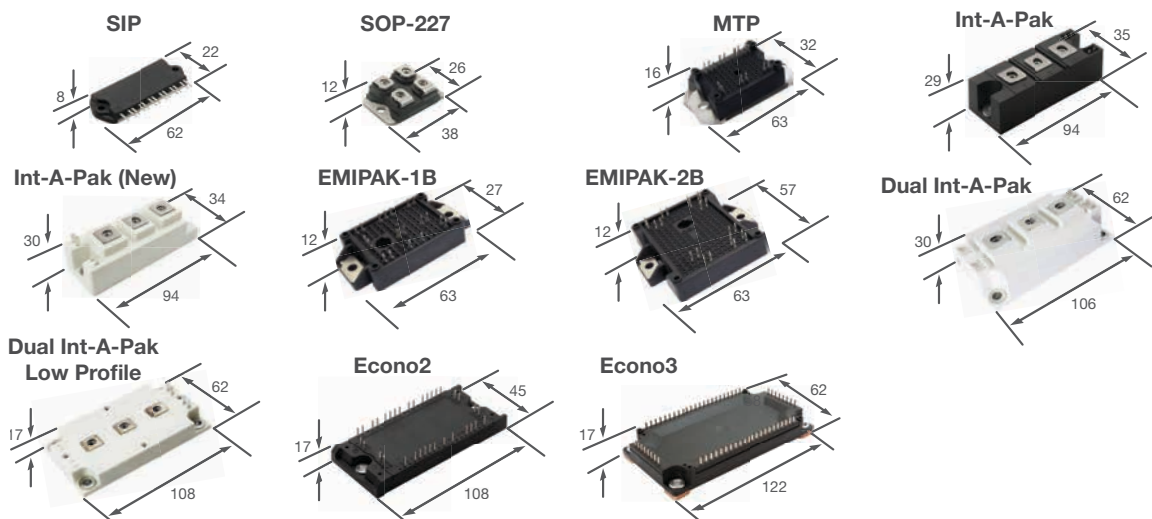
### Options

- Short-circuit capability available on many configurations
- Optional SMD integrated thermistor
- Customizable for specific application needs
- Automotive products upon request

### Applications

- Industrial high-frequency welding
- Switch mode power supplies
- Uninterruptible power supplies
- Motor drives
- Power factor correction
- Solar inverters

### Dimensions in Millimeters





# POWER MODULES

## IGBT Modules

### IGBT Modules



Product	Package Model	Max Dimensions L x W x H (mm)	Pin-Out	Circuit configuration Available	Voltage Range (V)	Current Ratings at 25 °C (A)	Frequency Speed Grade (kHz)
	SIP	62 x 22 x 8	Solderable Pins	6PAK Inverter Customized Configuration	600	8 to 30	1 to 60
	SOT-227	38 x 26 x 12	Screwable	Single Switch Chopper Customized Configuration	600 to 1200	50 to 200	DC to 150
	MTP	63 x 32 x 16	Screwable (PressFit Coming Soon)	Half Bridge Full Bridge Dual Forward Primary Rectifier and PFC Customized Configuration	600 to 1200	up to 100	up to 60
	EMIPAK-1B	63 x 34 x 12	PressFit	Neutral Point Clamp Topology Customized Configurations	600-1200	up to 55	up to 80
	EMIPAK-2B	63 x 57 x 12	PressFit	Double Interleaved Boost Converter 3-Levels Half-Bridge Inverter Customized Configurations	600-1200	up to 160	up to 80
	IAP (Int-A-Pak)	94 x 35 x 29	Screwable	Half Bridge Single Switch Customized Configuration	600 to 1200	100 to 20	DC to 60
	IAP (Int-A-Pak) New	94x34x30	Screwable	Single Switch Half Bridge Chopper Customized Configuration	600 to 1200	up to 100	up to 60
	ECON02	108 x 45 x 17	Solderable (PressFit Coming Soon)	4PAK Customized Configuration	600 to 1200	up to 100	up to 60
	ECON03	122 x 62 x 17	Solderable	4PAK	1200	up to 182	8 to 60



**POWER MODULES**

**IGBT Modules**

IGBT Modules, continued

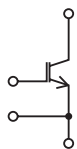
Product	Package Model	Max Dimensions L x W x H (mm)	Pin-Out	Circuit configuration Available	Voltage Range (V)	Current Ratings at 25 °C (A)	Frequency Speed Grade (kHz)
	DIAP (Dual Int-A-Pak)	106 x 62 x 30	Screwable	Single Switch	600 to 1200	up to 100	up to 60
				Half-Bridge			
				Chopper			
				Customized Configuration			
	DIAP LP (Dual Int-A-Pak Low Profile)	108 x 62 x 17	Screwable	Half-Bridge	600	up to 750	up to 30
				3-Levels Inverter			
				Customized Configuration			



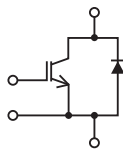
# POWER MODULES

## IGBT Modules



### Single-Switch IGBT Modules



Single-Switch No Diode



Single-Switch with Diode

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-GB90DA120U</a>	SOT-227	Single-Switch with Diode	Screwable	1200	149	90	90	3.30	5.8	8 to 60
	<a href="#">VS-GB90SA120U</a>	SOT-227	Single-Switch No Diode	Screwable	1200	149	90	90	3.30	5.8	8 to 60
	<a href="#">VS-GB90DA60U</a>	SOT-227	Single-Switch with Diode	Screwable	600	147	90	90	2.40	1.76	up to 150
	<a href="#">VS-GT120DA65U</a>	SOT-227	Single-Switch with Diode	Screwable	650	167	120	90	1.71	2.4	up to 20
	<a href="#">VS-GT140DA60U</a>	SOT-227	Single-Switch with Diode	Screwable	600	200	140	90	1.70	2.55	4 to 30
	<a href="#">VS-GT175DA120U</a>	SOT-227	Single-Switch with Diode	Screwable	1200	288	175	90	1.73	15.7	4 to 30
	<a href="#">VS-GA200SA60UP</a>	SOT-227	Single-Switch No Diode	Screwable	600	200	100	100	1.60	6.5	up to 40
	<a href="#">VS-GP250SA60S</a>	SOT-227	Single-Switch No Diode	Screwable	600	370	245	90	1.01	17.7	up to 5
	<a href="#">VS-GA250SA60S</a>	SOT-227	Single-Switch No Diode	Screwable	600	400	250	90	1.33	43.7	up to 5
	<a href="#">VS-GB300AH120N</a>	Dual Int-A-Pak	Single-Switch with Diode	Screwable	1200	620	300	80	1.90	58.0	8 to 60
	<a href="#">VS-GB400AH120N</a>	Dual Int-A-Pak	Single-Switch with Diode	Screwable	1200	650	400	80	1.90	81.0	8 to 60
	<a href="#">VS-GB600AH120N</a>	Dual Int-A-Pak	Single Switch with Diode	Screwable	1200	910	600	80	1.90	105.0	8 to 60

Note:

B. Bold indicates new product

1. Under development

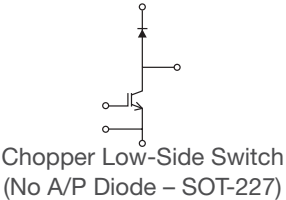
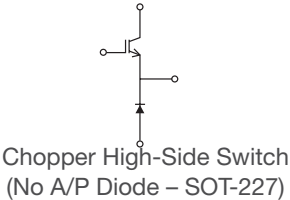
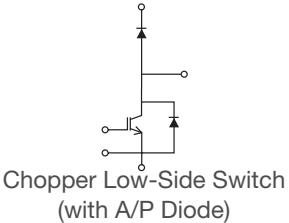
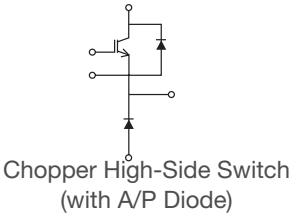
Contact Vishay for customization of circuit topology, IGBT speed, etc. for any listed package



# POWER MODULES

## IGBT Modules

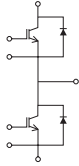
### Chopper IGBT Modules



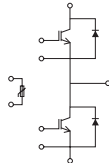
	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-GB55LA120UX</a>	SOT-227	Chopper Low Side Switch	Screwable	1200	84	57	80	3.30	4.7	8 to 60
	<a href="#">VS-GB55NA120UX</a>	SOT-227	Chopper High Side Switch	Screwable	1200	84	57	80	3.30	4.7	8 to 60
	<a href="#">VS-GB75LA60UF</a>	SOT-227	Chopper Low Side Switch	Screwable	600	109	75	80	2.31	1.1	up to 150
	<a href="#">VS-GB75NA60UF</a>	SOT-227	Chopper High Side Switch	Screwable	600	109	75	80	2.31	1.1	up to 150
	<a href="#">VS-GB50LP120N</a>	Int-A-Pak (New)	Chopper Low Side Switch	Screwable	1200	100	50	80	1.70	8.8	8 to 60
	<a href="#">VS-GB100LP120N</a>	Int-A-Pak (New)	Chopper Low Side Switch	Screwable	1200	200	100	80	1.80	18.5	8 to 60
	<a href="#">VS-GB100LH120N</a>	Dual Int-A-Pak	Chopper Low Side Switch	Screwable	1200	200	100	80	1.77	14.2	8 to 60
	<a href="#">VS-GB100NH120N</a>	Dual Int-A-Pak	Chopper High Side Switch	Screwable	1200	200	100	80	1.90	18.4	8 to 60
	<a href="#">VS-GB200LH120N</a>	Dual Int-A-Pak	Chopper Low Side Switch	Screwable	1200	370	200	80	2.07	39.0	8 to 60
	<a href="#">VS-GB200NH120N</a>	Dual Int-A-Pak	Chopper High Side Switch	Screwable	1200	420	200	80	1.80	39.0	8 to 60
	<a href="#">VS-GB300LH120N</a>	Dual Int-A-Pak	Chopper Low Side Switch	Screwable	1200	500	300	80	2.00	67.4	8 to 60
	<a href="#">VS-GB300NH120N</a>	Dual Int-A-Pak	Chopper High Side Switch	Screwable	1200	500	300	80	2.00	67.4	8 to 60

Note:  
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 1. Under development  
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### Half-Bridge IGBT Modules



Half-Bridge



Half-Bridge with Thermistor

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>C</sub> at 25 °C (A)	I <sub>C</sub> at T <sub>C</sub>		V <sub>CE(on)</sub> at T <sub>J</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>J</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-40MT120UHAPBF</a>	MTP	Half-Bridge	Solderable	1200	80	40	104	3.36	3.2	8 to 60
	<a href="#">VS-40MT120UHTAPBF</a>	MTP	Half-Bridge with Thermistor	Solderable	1200	80	40	104	3.36	3.2	8 to 60
	<a href="#">VS-50MT060WHTAPBF</a>	MTP	Half-Bridge with Thermistor	Solderable	600	114	50	109	2.30	2.4	60 to 100
	<a href="#">VS-70MT060WHTAPBF</a>	MTP	Half-Bridge with Thermistor	Solderable	600	100	70	78	2.10	2.4	60 to 150
	<a href="#">VS-GP100TS60SFPBF</a>	Int-A-Pak	Half-Bridge	Screwable	600	350	240	60	1.37	17.7	DC to 1
	<a href="#">VS-GA100TS60SFPBF</a>	Int-A-Pak	Half-Bridge	Screwable	600	220	100	130	1.11	41.0	DC to 1
	<a href="#">VS-GB100TS60NPBF</a>	Int-A-Pak	Half-Bridge	Screwable	600	108	74	80	2.60	2.1	8 to 60
	<a href="#">VS-GB150TS60NPBF</a>	Int-A-Pak	Half-Bridge with SMD Gate Resistor	Screwable	600	138	93	80	2.64	6.6	8 to 60
	<a href="#">VS-GB200TS60NPBF</a>	Int-A-Pak	Half-Bridge with SMD Gate Resistor	Screwable	600	209	142	80	2.60	11.6	8 to 60
	<a href="#">VS-GT50TP60N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	600	85	50	80	1.65	1.4	4 to 30
	<a href="#">VS-GB50TP120N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	1200	100	50	80	1.75	12.5	8 to 60
	<a href="#">VS-GT50TP120N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	1200	100	50	80	1.90	9.9	4 to 30
	<a href="#">VS-GB75TP120N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	1200	150	75	80	1.80	16.8	8 to 60
	<a href="#">VS-GB75TP120U</a>	Int-A-Pak (New)	Half-Bridge	Screwable	1200	105	75	80	3.20	10.0	8 to 60
	<a href="#">VS-GT100TP60N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	600	160	100	80	1.65	2.5	4 to 30

Note:

B. Bold indicates new product

1. Under development



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# POWER MODULES

## IGBT Modules

Half-Bridge IGBT Modules, continued

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-GB100TP120N</a>	Int-A-Pak (New)	Half-Bridge	Screwable	1200	200	100	80	1.80	18.4	8 to 60
	<a href="#">VS-GT200TP065N</a>	<b>Int-A-Pak (New)</b>	<b>Half-Bridge</b>	<b>Screwable</b>	<b>650</b>	<b>221</b>	<b>166</b>	<b>80</b>	<b>1.90</b>	<b>6.8</b>	<b>up to 30</b>
	<a href="#">VS-GB100TH120U</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	200	100	80	3.46	14.0	8 to 60
	<a href="#">VS-GB100TH120N</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	200	100	80	1.80	14.2	8 to 60
	<a href="#">VS-GB150TH120N</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	225	150	80	1.70	37.0	8 to 60
	<a href="#">VS-GB150TH120U</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	280	150	80	3.1	28.5	8 to 60
	<a href="#">VS-GA200TH60S</a>	Dual Int-A-Pak	Half-Bridge	Screwable	600	260	200	80	1.90	16.4	DC to 1
	<a href="#">VS-GB200TH120N</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	360	200	80	1.90	38.2	8 to 60
	<a href="#">VS-GB200TH120U</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	330	200	80	3.10	38.2	8 to 60
	<a href="#">VS-GB300TH120N</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	500	300	80	2.00	67.4	8 to 60
	<a href="#">VS-GB300TH120U</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	530	300	80	3.10	53.3	8 to 60
	<a href="#">VS-GT400TH60N</a>	Dual Int-A-Pak	Half-Bridge	Screwable	600	530	400	80	1.60	40.0	4 to 30
<a href="#">VS-GB400TH120U</a>	Dual Int-A-Pak	Half-Bridge	Screwable	1200	660	400	80	3.1	63.3	8 to 60	

Note:  
 B. Bold indicates new product  
 1. Under development  
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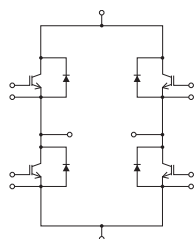
# POWER MODULES

## IGBT Modules


Half-Bridge IGBT Modules, continued

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-GP300TD60S</a>	Dual Int-A-Pak Low-Profile	Half-Bridge	Screwable	600	580	400	80	1.30	62.4	DC to 1
	<a href="#">VS-GP400TD60S</a>	Dual Int-A-Pak Low-Profile	Half-Bridge	Screwable	600	758	525	80	1.30	81.2	DC to 1

### Full-Bridge IGBT Modules



Full-Bridge

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-20MT120UFAPbF</a>	MTP	Full-Bridge	Solderable	1200	40	20	96	3.29	1.5	8 to 60
	<a href="#">VS-20MT120UFP</a>	MTP	Full-Bridge	Solderable	1200	40	20	106	3.29	2.1	8 to 60
	<a href="#">VS-25MT060WFAPbF</a>	MTP	Full-Bridge	Solderable	600	69	46	80	2.22	0.9	8 to 60

Note:

B. Bold indicates new product

1. Under development

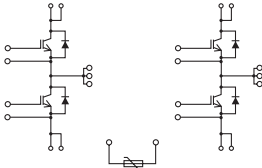
Contact Vishay for customization of circuit topology, IGBT speed, etc. for any listed package



# POWER MODULES

## IGBT Modules

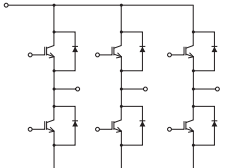
### 4-PAK IGBT Modules



4-Pak (Thermistor Option Available)

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sup>c</sup> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-GB50YF120N</a>	ECON02	4-Pak	Solderable	1200	66	44	80	3.49	3.5	8 to 60
	<a href="#">VS-GB75YF120N</a>	ECON02	4-Pak	Solderable	1200	100	67	80	3.40	7.6	8 to 60
	<a href="#">VS-GB75YF120UT</a>	ECON02	4-Pak with Thermistor	Solderable	1200	100	67	80	3.40	4.8	8 to 60

### 6-PAK IGBT Modules



Three-Phase Inverter

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sup>c</sup> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-CPV362M4FPbF</a>	SIP	Three-Phase Inverter	Solderable	600	8.8	4.8	100	1.41	0.9	1 to 10
	<a href="#">VS-CPV362M4UPbF</a>	SIP	Three-Phase Inverter	Solderable	600	7.2	3.9	100	1.70	0.4	Over 5
	<a href="#">VS-CPV363M4UPbF</a>	SIP	Three-Phase Inverter	Solderable	600	13	6.8	100	1.70	0.5	1 to 10
	<a href="#">VS-CPV364M4FPbF</a>	SIP	Three-Phase Inverter	Solderable	600	27	15	100	1.35	2.5	1 to 10
	<a href="#">VSCP364M4KPbF</a>	SIP	Three-Phase Inverter	Solderable	600	24	13	100	1.80	1.3	Over 5
	<a href="#">VS-CPV364M4UPbF</a>	SIP	Three-Phase Inverter	Solderable	600	20	10	100	1.56	0.7	Over 5

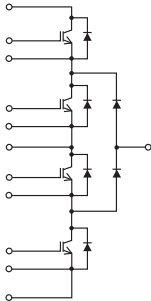
Note:  
 B. Bold indicates new product  
 1. Under development  
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# POWER MODULES

## IGBT Modules

### 3-Levels IGBT Modules



Three-Levels Half-Bridge Inverter Stage

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sub>c</sub> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-ETF075Y60U</a>	EMIPAK-2B	3-Levels Half-Bridge Inverter Stage	PressFit	600	154	113	80	1.45	2.8	up to 20
	<a href="#">VS-ETF150Y65U</a>	EMIPAK-2B	3-Levels Half-Bridge Inverter Stage	PressFit	650	180	150	60	2.04	2.10	up to 20
	<a href="#">VS-ETF150Y65N</a>	EMIPAK-2B	3-Levels Half-Bridge Inverter Stage	PressFit	650	201	171	60	1.70	5.1	up to 20
	<a href="#">VS-GT300FD060N</a>	DIAP Low-Profile	3-Levels Half-Bridge Inverter Stage	Screwable	600	396	300	80	1.72	27.6	4 to 30

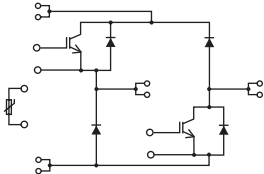
Note:  
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# POWER MODULES

## IGBT Modules

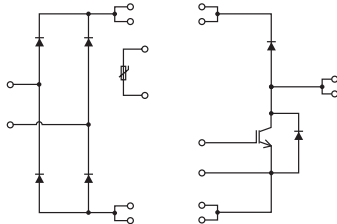
### Dual Forward IGBT Modules




Dual Forward

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sup>c</sup> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-100MT060WDF</a>	MTP	Dual Forward	Solderable	600	121	83	80	1.93	2.6	6 to 150
	<a href="#">VS-150MT060WDF</a>	MTP	Dual Forward	Solderable	600	138	96	80	2.11	3.4	70 to 200
	<a href="#">VS-150MT060WDF-P</a>	MTP (PressFit Pins)	Dual Forward	PressFit	600	138	96	80	2.11	3.4	50 to 200

### Primary Rectifier and PFC IGBT Modules



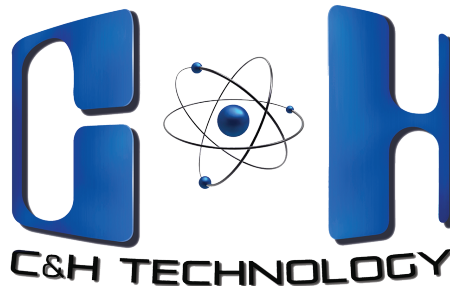
Primary Rectifier and PFC

	Device <sup>(B)</sup>	Package	Circuit	Pin Out	V <sub>CES</sub> (V)	I <sup>c</sup> at 25 °C (A)	I <sub>c</sub> at T <sub>c</sub>		V <sub>CE(on)</sub> at T <sub>j</sub> = 25 °C typ. (V)	E <sub>tot</sub> at T <sub>j</sub> = 125 °C (mJ)	Speed (kHz)
							(A)	(°C)			
	<a href="#">VS-70MT060WSP</a>	MTP	Primary Rectifier and PFC	Solderable	600	96	66	80	1.93	0.57	up to 150
	<a href="#">VS-100MT060WSP</a>	MTP	Primary Rectifier and PFC	Solderable	600	107	73	80	2.14	1.95	up to 150

Note:  
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**CONTACT US**

**C&H Technology Inc.**

6121 Baker Rd. Suite 108 Minnetonka, MN 55345  
PH: 1-952-933-6190 TOLL FREE: 1-800-274-4284  
FAX: 1-952-933-6223

[www.chtechnology.com](http://www.chtechnology.com) [sales@chtechnology.com](mailto:sales@chtechnology.com)

