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Power Modules Selector Guide



FEATURED PRODUCTS

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

RESOURCES

- For technical support, contact modules@vishay.com
- For further information, visit www.vishay.com and click on modules
- Material categorization: for definitions of compliance, please see www.vishay.com/doc?99912



RoHS
COMPLIANT



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**Diode and Thyristor Modules Overview**

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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 centertapped 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

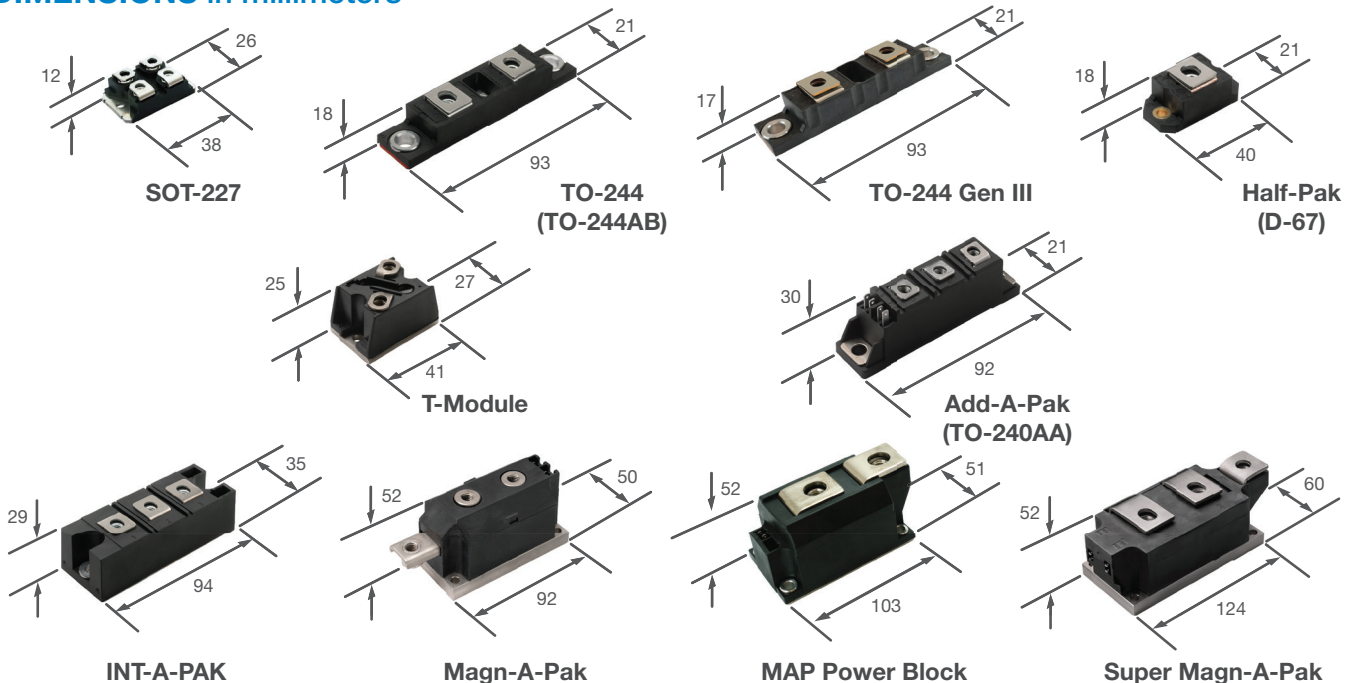
- Wide range of industry-standard package styles
- Direct mounting on heatsink
- Choice of rectifier and thyristor technologies
- Optimized high voltage diode and SCR
- Fast recovery diode modules available
- High isolation voltage (2500 V)
- RoHS-compliant
- Low thermal resistance
- Low / high temperature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

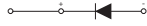


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Standard Recovery Diode Modules - Single



VS-T...HF...
VS-VSKE...PbF



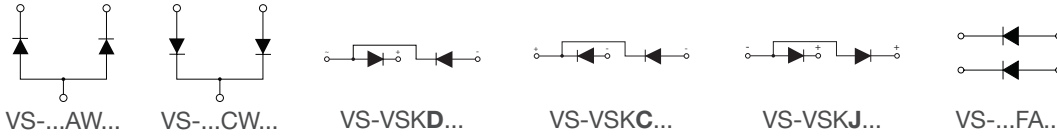
VS-VSKE.../...

Package	Device	Type	V _{RRM} Range (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 D-55 (T-module) (isolated)	VS-T20HF220	Single diode	2200	20	85	1.5	60	450
	VS-T40HF10 to VS-T40HF120	Single diode	100 to 1200	40	85	1.3	126	570
	VS-T70HF10 to VS-T70HF120	Single diode	100 to 1200	70	85	1.35	220	1200
	VS-T85HF10 to VS-T85HF120	Single diode	100 to 1200	85	85	1.27	267	1700
	VS-T110HF10 to VS-T110HF120	Single diode	100 to 1200	110	85	1.35	345	2000
 AAP Gen 7 (TO-240AA) (isolated)	VS-VSKE56/04 to VS-VSKE56/16	Single diode	400 to 1600	60	114	1.6	188	1303
	VS-VSKE71/04 to VS-VSKE71/16	Single diode	400 to 1600	80	110	1.6	251	1503
	VS-VSKE91/04 to VS-VSKE91/16	Single diode	400 to 1600	100	112	1.55	314	2023
 INT-A-PAK (isolated)	VS-VSKE166/04PbF to VS-VSKE166/16PbF	Single diode	400 to 1600	165	100	1.43	518	4003
	VS-VSKE196/04PbF to VS-VSKE196/16PbF	Single diode	400 to 1600	195	100	1.38	613	4753
	VS-VSKE236/04PbF to VS-VSKE236/16PbF	Single diode	400 to 1600	230	100	1.46	723	5503
 MAGN-A-PAK (isolated)	VS-VSKE250-08PbF to VS-VSKE250-20PbF	Single diode	400 to 2000	250	100	1.29	785	7017
	VS-VSKE270-04PbF to VS-VSKE270-30PbF	Single diode	400 to 3000	270	100	1.48	848	8922
	VS-VSKE320-04PbF to VS-VSKE320-20PbF	Single diode	400 to 2000	320	100	1.28	1005	10 112



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Standard Recovery Diode Modules - Dual



Package	Device	Type	V _{RRM} Range (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 AAP Gen 7 (TO-240AA) (isolated)	VS-VSKx56/04 to VS-VSKx56/16	Two diodes common anode / cathode, doubler circuit	400 to 1600	60	114	1.6	188	1302
	VS-VSKx71/04 to VS-VSKx71/16	Two diodes common anode / cathode, doubler circuit	400 to 1600	80	110	1.6	251	1502
	VS-VSKx91/04 to VS-VSKx91/16	Two diodes common anode / cathode, doubler circuit	400 to 1600	100	112	1.55	314	2022
 SOT-227 (isolated)	VS-RA160FA120	Two separate diodes, parallel pin-out	1200	91	90	1.27	100	940
	VS-RA220FA120	Two separate diodes, parallel pin-out	1200	108	90	1.31	110	1170
 TO-244 (not isolated)	VS-VSMD400AW60	Two diodes common anode	600	200	133	1.31	200	2500
	VS-VSMD400CW60	Two diodes common cathode	600	200	133	1.31	200	2500
 INT-A-PAK (isolated)	VS-VSKx166/04PbF to VS-VSKx166/16PbF	Two diodes common anode / cathode, doubler circuit	400 to 1600	165	100	1.43	518	4002
	VS-VSKx196/04PbF to VS-VSKx196/16PbF	Two diodes common anode / cathode, doubler circuit	400 to 1600	195	100	1.38	613	4752
	VS-VSKx236/04PbF to VS-VSKx236/16PbF	Two diodes common anode / cathode, doubler circuit	400 to 1600	230	100	1.46	723	5502
 MAGN-A-PAK (isolated)	VS-VSKx250-08PbF to VS-VSKx250-20PbF	Two diodes common anode / cathode, doubler circuit	400 to 2000	250	100	1.29	785	7016
	VS-VSKx270-04PbF to VS-VSKx270-30PbF	Two diodes common anode / cathode, doubler circuit	400 to 3000	270	100	1.48	848	8921
	VS-VSKx320-04PbF to VS-VSKx320-20PbF	Two diodes common anode / cathode, doubler circuit	400 to 2000	320	100	1.28	1005	10 111
 Super MAGN-A-PAK (isolated)	VS-VSKD600-04PbF to VS-VSKD600-20PbF	Two diodes doubler circuit	800 to 2000	600	100	1.45	1800	19 000



POWER MODULES


Diode Modules

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Fast Recovery Diode Modules



VS-T...HFL...

Package	Device	Type	V _{RRM} Range (V)	I _{F(AV)} per Diode at T _c		Max. V _F at I _F		Typ. t _{rr} at 25 °C (ns)	Typ. Q _{rr} at 125 °C (nC)	Setup
				(A)	(°C)	(V)	(A)			
 <p>D-55 (T-module) (isolated)</p>	VS-T40HFL10S02 to VS-T40HFL60S02	Single diode	100 to 1000	40	70	1.6	126	200	550	126 A, 25 A/μs, 30 V
	VS-T40HFL10S05 to VS-T40HFL100S05	Single diode	100 to 1000	40	70	1.6	220	500	2000	220 A, 25 A/μs, 30 V
	VS-T40HFL10S10 to VS-T40HFL100S10	Single diode	100 to 1000	40	70	1.6	267	1000	8000	267 A, 25 A/μs, 30 V
	VS-T70HFL10S02 to VS-T70HFL60S02	Single diode	100 to 1000	70	70	1.73	126	200	600	126 A, 25 A/μs, 30 V
	VS-T70HFL10S05 to VS-T70HFL100S05	Single diode	100 to 1000	70	70	1.73	220	500	2100	220 A, 25 A/μs, 30 V
	VS-T70HFL10S10 to VS-T70HFL100S10	Single diode	100 to 1000	70	70	1.73	267	1000	8500	267 A, 25 A/μs, 30 V
	VS-T85HFL10S02 to VS-T85HFL60S02	Single diode	100 to 1000	85	70	1.55	126	200	800	126 A, 25 A/μs, 30 V
	VS-T85HFL10S05 to VS-T85HFL100S05	Single diode	100 to 1000	85	70	1.55	220	500	3500	220 A, 25 A/μs, 30 V
	VS-T85HFL10S10 to VS-T85HFL100S10	Single diode	100 to 1000	85	70	1.55	267	1000	1500	267 A, 25 A/μs, 30 V

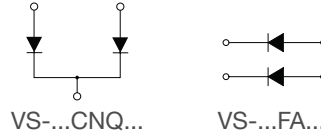




POWER MODULES

Diode Modules

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Schottky TMBS® Diode Modules



Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 SOT-227 (isolated)	VS-QA250FA20	Two separate diodes, parallel pin out	200	125	106	1.2	200	900
	VS-QA300FA17	Two separate diodes, parallel pin out	170	150	132	0.85	100	1575
 TO-244 (not isolated)	VS-402CNQ200PBF	Two diodes common cathode	200	200	143	1.05	200	2100

Schottky Diode Modules - Single




Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 HALF-PAK (D-67) (not isolated)	VS-125NQ015PbF	Single diode	15	120	74	0.37	120	1700
	VS-122NQ030PbF	Single diode	30	120	115	0.47	120	2000
	VS-120NQ045PbF	Single diode	45	120	105	0.62	120	1550
	VS-121NQ045PbF	Single diode	45	120	137	0.6	120	2000
	VS-123NQ100PbF	Single diode	100	120	133	0.73	120	1800
	VS-182NQ030PbF	Single diode	30	180	108	0.45	180	2500
	VS-180NQ045PbF	Single diode	45	180	105	0.63	180	2400
	VS-183NQ100PbF	Single diode	100	180	128	0.73	180	2500
	VS-245NQ015PbF	Single diode	15	240	73	0.37	240	3000
	VS-242NQ030PbF	Single diode	30	240	118	0.45	240	3000
	VS-240NQ045PbF	Single diode	45	240	104	0.64	240	3400
	VS-241NQ045PbF	Single diode	45	240	144	0.64	240	3450
	VS-243NQ100PbF	Single diode	100	240	132	0.72	240	3300
	VS-249NQ150PbF	Single diode	150	240	121	0.78	240	2300



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Schottky Diode Modules - Dual



Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _c		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 AAP Gen 7 (TO-240AA) (isolated)	VS-VSKCS200/045	Two diodes common cathode	45	100	91	0.67	100	1700
	VS-VSKDS200/045	Two diodes doubler circuit	45	100	91	0.67	100	1700
	VS-VSKCS201/045	Two diodes common cathode	45	100	123	0.72	100	1850
	VS-VSKDS201/045	Two diodes doubler circuit	45	100	123	0.72	100	1850
	VS-VSKCS203/100	Two diodes common cathode	100	100	121	0.99	100	1700
	VS-VSKDS203/100	Two diodes doubler circuit	100	100	121	0.99	100	1700
	VS-VSKJS203/100	Two diodes common anode	100	100	121	0.99	100	1700
	VS-VSKCS209/150	Two diodes common cathode	150	100	113	1.01	100	1600
	VS-VSKDS209/150	Two diodes doubler circuit	150	100	113	1.01	100	1600
	VS-VSKJS209/150	Two diodes common anode	150	100	113	1.01	100	1600
	VS-VSKCS220/030	Two diodes common cathode	30	110	110	0.59	110	2000
	VS-VSKDS220/030	Two diodes doubler circuit	30	110	110	0.59	110	2000
	VS-VSKCS400/045	Two diodes common cathode	45	200	91	0.67	200	3400
	VS-VSKDS400/045	Two diodes doubler circuit	45	200	91	0.67	200	3400
	VS-VSKCS401/045	Two diodes common cathode	45	200	120	0.72	200	3400
	VS-VSKDS401/045	Two diodes doubler circuit	45	200	120	0.72	200	3450
	VS-VSKCS408/060	Two diodes common cathode	60	200	102	0.74	200	3300
	VS-VSKDS408/060	Two diodes doubler circuit	60	200	102	0.74	200	3300
	VS-VSKCS403/100	Two diodes common cathode	100	200	104	0.99	200	2600
	VS-VSKDS403/100	Two diodes doubler circuit	100	200	104	0.99	200	2600
	VS-VSKJS403/100	Two diodes common anode	100	200	121	0.99	200	2600
	VS-VSKCS409/150	Two diodes common cathode	150	200	105	1.03	200	2300
	VS-VSKDS409/150	Two diodes doubler circuit	150	200	105	1.03	200	2300
	VS-VSKJS409/150	Two diodes common anode	150	200	105	1.03	200	2300
	VS-VSKCS440/030	Two diodes common cathode	30	220	97	0.68	220	3000
	VS-VSKDS440/030	Two diodes doubler circuit	30	220	97	0.68	220	3000
VS-VSKJS440/030	Two diodes common anode	30	220	97	0.68	220	3000	




POWER MODULES

Diode Modules

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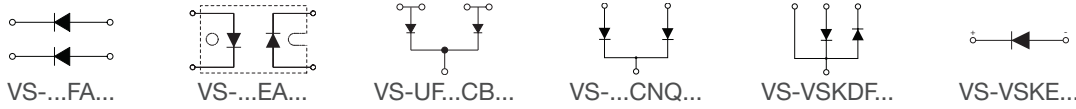
Schottky Diode Modules - Dual, continued


Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		I _{FSM} (A)
				(A)	(°C)	(V)	(A)	
 <p>T0-244 (not isolated)</p>	VS-200CNQ045PbF	Two diodes common cathode	45	100	116	0.55	100	1550
	VS-201CNQ045PbF	Two diodes common cathode	45	100	146	0.67	100	2000
	VS-201CNQ050PbF	Two diodes common cathode	50	100	146	0.67	100	2000
	VS-203CNQ100PbF	Two diodes common cathode	100	100	142	0.86	100	1700
	VS-209CNQ135PbF	Two diodes common cathode	135	100	131	1.06	100	1200
	VS-209CNQ150PbF	Two diodes common cathode	150	100	131	1.06	100	1200
	VS-220CNQ030PbF	Two diodes common cathode	30	110	122	0.49	110	1950
	VS-301CNQ040PbF	Two diodes common cathode	40	150	132	0.69	150	3200
	VS-300CNQ045PbF	Two diodes common cathode	45	150	111	0.61	150	2400
	VS-301CNQ045PbF	Two diodes common cathode	45	150	132	0.69	150	3200
	VS-303CNQ100PbF	Two diodes common cathode	100	150	138	0.91	150	2500
	VS-401CNQ040PbF	Two diodes common cathode	40	200	147	0.67	200	3450
	VS-400CNQ045PbF	Two diodes common cathode	45	200	114	0.57	200	3400
	VS-401CNQ045PbF	Two diodes common cathode	45	200	147	0.67	200	3450
	VS-403CNQ100PbF	Two diodes common cathode	100	200	141	0.84	200	3300
	VS-409CNQ135PbF	Two diodes common cathode	135	200	129	1.13	200	2300
	VS-409CNQ150PbF	Two diodes common cathode	150	200	129	1.13	200	2300
VS-440CNQ030PbF	Two diodes common cathode	30	220	125	0.51	220	3000	



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Ultrafast Diode Modules - FRED Pt®



Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		Typ. t _{rr} at 25 °C (ns)	Typ. Q _{rr} at 125 °C (nC)	Setup
				(A)	(°C)	(V)	(A)			
 <p>SOT-227 (isolated)</p>	VS-UFB80FA20	Two separate diodes, parallel pin out	200	40	137	1.08	30	34	184	30 A, 200 A/μs, 100 V
	VS-UFB130FA20	Two separate diodes, parallel pin out	200	65	132	1.13	60	42	295	50 A, 200 A/μs, 100 V
	VS-UFB280FA20	Two separate diodes, parallel pin out	200	175	95	1.1	120	34	300	150 A, 200 A/μs, 160 V
	VS-UFH280FA30	Two separate diodes, parallel pin out	300	160	95	1.27	100	58	429	50 A, 200 A/μs, 200 V
	VS-UFB80FA40	Two separate diodes, parallel pin out	400	40	130	1.39	30	68	900	50 A, 200 A/μs, 200 V
	VS-UFB130FA40	Two separate diodes, parallel pin out	400	65	123	1.37	60	86	1400	50 A, 200 A/μs, 200 V
	VS-UFB201FA40	Two separate diodes, parallel pin out	400	120	88	1.59	100	80	1300	50 A, 200 A/μs, 200 V
	VS-UFB280FA40	Two separate diodes, parallel pin out	400	170	90	1.24	100	93	1740	150 A, 200 A/μs, 200 V
	VS-UFB211FA40	Two separate diodes, parallel pin out	400	210	90	1.24	100	93	1740	150 A, 200 A/μs, 200 V
	VS-UFB80FA60	Two separate diodes, parallel pin out	600	57	85	1.9	60	79	1085	30 A, 200 A/μs, 200 V
	VS-UFL80FA60	Two separate diodes, parallel pin out	600	65	85	1.49	60	115	1900	30 A, 200 A/μs, 200 V
	VS-UFB130FA60	Two separate diodes, parallel pin out	600	82	85	1.8	60	79	1220	50 A, 200 A/μs, 200 V
	VS-UFL130FA60	Two separate diodes, parallel pin out	600	87	85	1.6	60	105	1850	50 A, 200 A/μs, 200 V
	VS-UFB170FA60	Two separate diodes, parallel pin out	600	94	90	1.43	100	220	9100	50 A, 500 A/μs, 200 V
	VS-UFB230FA60	Two separate diodes, parallel pin out	600	141	85	1.78	100	83	1595	50 A, 200 A/μs, 200 V
	VS-UFL230FA60	Two separate diodes, parallel pin out	600	160	85	1.44	100	104	2200	50 A, 200 A/μs, 200 V
	VS-UFB250FA60	Two separate diodes, parallel pin out	600	168	90	1.19	100	166	10 000 (150 °C)	50 A, 500 A/μs, 200 V
	VS-UFL330FA60	Two separate diodes, parallel pin out	600	243	90	1.65	200	98	2788	50 A, 500 A/μs, 200 V
	VS-U5FH60FA60	Two separate diodes, parallel pin out	600	30	132	1.8	30	61	1300	30 A, 1000 A/μs, 400 V
	VS-U5FX60FA60	Two separate diodes, parallel pin out	600	30	128	2.1	30	57	900	30 A, 1000 A/μs, 400 V
	VS-U5FH120FA60	Two separate diodes, parallel pin out	600	60	115	1.7	60	67	2200	60 A, 1000 A/μs, 400 V
	VS-U5FX120FA60	Two separate diodes, parallel pin out	600	60	100	2.2	60	63	1600	60 A, 1000 A/μs, 400 V
	VS-U5FH150FA60	Two separate diodes, parallel pin out	600	75	100	1.7	75	70	2500	75 A, 1000 A/μs, 400 V
VS-U5FX150FA60	Two separate diodes, parallel pin out	600	75	102	2.2	75	65	940	75 A, 1000 A/μs, 400 V	
VS-U5FH300FA60	Two separate diodes, parallel pin out	600	150	98	1.7	150	76	4100	150 A, 1000 A/μs, 400 V	
VS-U5FX300FA60	Two separate diodes, parallel pin out	600	150	80	2.2	150	72	2600	150 A, 1000 A/μs, 400 V	



POWER MODULES

Diode Modules

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Ultrafast Diode Modules - FRED Pt®, continued

Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _c		Max. V _F at I _F		Typ. t _{rr} at 25 °C (ns)	Typ. Q _{rr} at 125 °C (nC)	Setup
				(A)	(°C)	(V)	(A)			
 SOT-227 (isolated)	VS-U5FH60FA120	Two separate diodes, parallel pin out	1200	30	105	2.5	30	54	3100	30 A, 1000 A/μs, 800 V
	VS-U5FX60FA120	Two separate diodes, parallel pin out	1200	30	85	3.57	30	41	2300	30 A, 1000 A/μs, 800 V
	VS-U5FH120FA120	Two separate diodes, parallel pin out	1200	60	85	2.5	60	71	5500	60 A, 1000 A/μs, 800 V
	VS-U5FH120EA120	Two separate diodes, antiparallel pin out	1200	60	85	2.5	60	71	5500	60 A, 1000 A/μs, 800 V
	VS-U5FX120FA120	Two separate diodes, parallel pin out	1200	60	75	3.52	60	46	3500	60 A, 1000 A/μs, 800 V
	VS-U5FX120EA120	Two separate diodes, antiparallel pin out	1200	60	75	3.52	60	46	3500	60 A, 1000 A/μs, 800 V
	VS-U5FH240FA120	Two separate diodes, parallel pin out	1200	120	75	2.5	120	98	9500	120 A, 1000 A/μs, 800 V
	VS-U5FX240FA120	Two separate diodes, parallel pin out	1200	120	76	3.52	120	60	6200	120 A, 1000 A/μs, 800 V
 SOT-227 (not isolated)	VS-UFB310CB40	Two diodes common cathode	400	155	135	1.34	100	89	1840	50 A, 200 A/μs, 200 V
	VS-UFL250CB60	Two diodes common cathode	600	130	135	1.44	100	104	2200	50 A, 200 A/μs, 200 V
 TO-244 (not isolated)	VS-VSUD400CW20	Two diodes common cathode	200	240	127	1	200	87	493	50 A, 200 A/μs, 200 V
	VS-VSUD360CW40	Two diodes common cathode	400	180	116	1.27	180	74	1295 (150 °C)	180 A, 200 A/μs, 200 V
	VS-VSUD400CW60	Two diodes common cathode	600	200	97	2	200	90	4730 (150°C)	200 A, 200 A/μs, 200 V
	VS-VSUD405CW60	Two diodes common cathode	600	200	132	1.36	200	124	5000	50 A, 500 A/μs, 200 V
	VS-VSUD410CW60	Two diodes common cathode	600	200	137	1.2	200	215	15 100 (150 °C)	50 A, 500 A/μs, 200 V
	VS-VS5HD240CW60	Two diodes common cathode	600	120	115	1.68	120	52	1530	50 A, 200 A/μs, 300 V
	VS-VS5HD300CW60	Two diodes common cathode	600	150	109	1.7	150	68	3150	50 A, 200 A/μs, 300 V
	VS-VS5HD480CW60	Two diodes common cathode	600	240	113	1.7	240	61	2860	50 A, 200 A/μs, 300 V
	VS-VS5HD600CW60	Two diodes common cathode	600	271	106	1.7	300	78	4000	50 A, 200 A/μs, 300 V
 TO-244 Gen III (not isolated)	VS-VSUD505CW60	Two diodes common cathode	600	250	129	1.36	250	179	3140	50 A, 50 A/μs, 400 V
	VS-VSUD510CW60	Two diodes common cathode	600	250	134	1.17	250	270	7820 (150 °C)	50 A, 50 A/μs, 400 V
 INT-A-PAK (isolated)	VS-VSKDF400/06PbF	Diode doubler circuit	600	400	80	1.67	400	159	4300	150 A, 200 A/μs, 400 V
	VS-VSKDF500/06PbF	Diode doubler circuit	600	519	90	1.66	500	104	13 800	150 A, 1000 A/μs, 400 V
	VS-VSKEF500/06PbF	Single diode	600	519	90	1.66	500	104	13 800	150 A, 1000 A/μs, 300 V
	VS-VSKDF600/06PbF	Diode doubler circuit	600	600	75	1.77	600	150	7030	150 A, 200 A/μs, 400 V

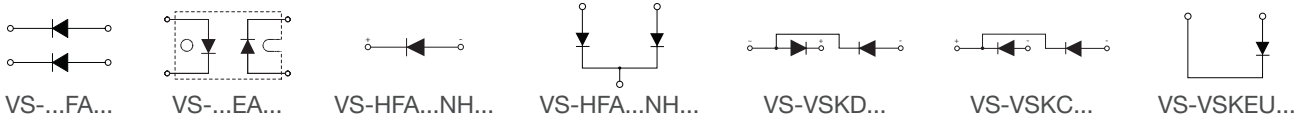


POWER MODULES

Diode Modules

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Ultrafast Diode Modules - HEXFRED®



Package	Device	Type	V _{RRM} (V)	I _{F(AV)} per Diode at T _C		Max. V _F at I _F		Typ. t _{rr} at 25 °C (ns)	Typ. Q _{rr} at 125 °C (nC)	Setup
				(A)	(°C)	(V)	(A)			
 HALF-PAK (D-67) (not isolated)	VS-HFA90NH40PbF	Single diode	400	106	100	1.45	90	90	1200	90 A, 200 A/μs, 200 V
	VS-HFA135NH40PbF	Single diode	400	138	100	1.65	135	77	2800	135 A, 200 A/μs, 200 V
	VS-HFA180NH40PbF	Single diode	400	200	100	1.46	180	90	2650	135 A, 200 A/μs, 200 V
 SOT-227 (isolated)	VS-HFA140FA60	Two separate diodes, parallel pin out	600	70	110	2.04	120	90	1180	50 A, 200 A/μs, 200 V
	VS-HFA70FA120	Two separate diodes, parallel pin out	1200	35	110	3	30	134	1770	50 A, 200 A/μs, 200 V
	VS-HFA70EA120	Two separate diodes, antiparallel pin out	1200	35	121	3	30	145	1920	50 A, 200 A/μs, 200 V
	VS-HFA90FA120	Two separate diodes, parallel pin out	1200	45	83	3.3	40	80	740	40 A, 200 A/μs, 200 V
	VS-HFA140FA120	Two separate diodes, parallel pin out	1200	70	74	4	60	145	1920	50 A, 200 A/μs, 200 V
	VS-HFA220FA120	Two separate diodes, parallel pin out	1200	110	68	3.6	100	157	2850	50 A, 200 A/μs, 200 V
 TO-244 (not isolated)	VS-HFA320NJ40CPbF	Two diodes common cathode	400	160	115	1.35	160	90	2600	160 A, 200 A/μs, 200 V
	VS-HFA240NJ40CPbF	Two diodes common cathode	400	197	100	1.47	120	77	2300	140 A, 200 A/μs, 200 V
	VS-HFA140NJ60CPbF	Two diodes common cathode	600	84	100	1.89	70	80	980	70 A, 200 A/μs, 200 V
	VS-HFA210NJ60CPbF	Two diodes common cathode	600	120	100	1.9	105	90	1200	105 A, 200 A/μs, 200 V
	VS-HFA280NJ60CPbF	Two diodes common cathode	600	149	100	1.8	105	92	1400	105 A, 200 A/μs, 200 V
 INT-A-PAK (isolated)	VS-VSKCU300/06PbF	Two diodes common cathode	600	300	48	1.53	150	130	1800	50 A, 200 A/μs, 400 V
	VS-VSKDU300/06PbF	Two diodes doubler circuit	600	300	48	1.53	150	130	1800	50 A, 200 A/μs, 400 V
	VS-VSKDU162/12PbF	Two diodes doubler circuit	1200	110	100	3.9	160	150	2000	160 A, 200 A/μs, 200 V
 INT-A-PAK (isolated)	VS-VSKEU300/12PbF	Single diode	1200	300	60	2.23	300	233	3500	45 A, 500 A/μs, 400 V



POWER MODULES

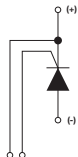
Thyristor Modules

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Thyristor Modules - Single



VS-T...RIA...
VS-TA...SA...



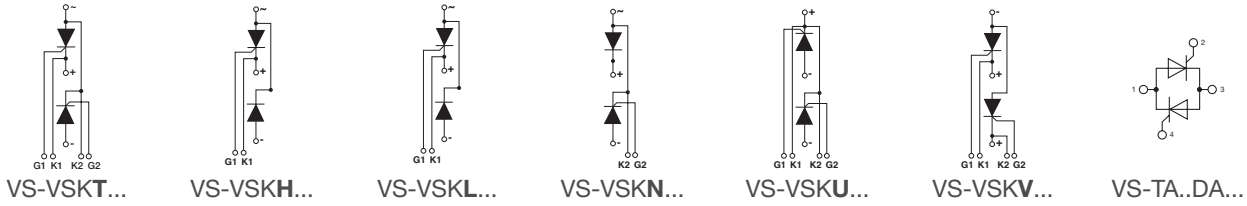
VS-VSKS...



Package	Device	Type	V _{RRM} Range (V)	I _{T(AV)} per SCR at T _c		Max. V _T at I _T		I _{TSM} (A)
				(A)	(°C)	(V)	(A)	
 D-55 (T-module) (isolated)	VS-T50RIA10 to VS-T50RIA120	Single SCR	100 to 1200	50	70	1.6	157	1310
	VS-T70RIA10 to VS-T70RIA120	Single SCR	100 to 1200	70	70	1.55	220	1660
	VS-T90RIA10 to VS-T90RIA120	Single SCR	100 to 1200	90	70	1.55	283	1780
 MAP Power Block (isolated)	VS-VSKS500/08PbF	Single SCR	800	500	76	11	500	14 000
 SOT-227 (isolated)	VS-TA160SA120	Single SCR	1200	158	75	1.45	150	1390



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Thyristor Modules - Dual



Package	Device	Type	V _{RRM} Range (V)	I _{T(AV)} per SCR at T _C		Max. V _T at I _T		I _{TSM} (A)
				(A)	(°C)	(V)	(A)	
 AAP Gen 7 (TO-240AA) (isolated)	VS-VSKx26/04 to VS-VSKx26/16	SCR / diode common anodes, doubler positive-negative control, two SCRs common cathodes-anodes, doubler	400 to 1600	27	85	1.65	85	400
	VS-VSKx41/04 to VS-VSKx41/16	SCR / diode common anodes, doubler positive-negative control, two SCRs doubler	400 to 1600	45	85	1.81	141	850
	VS-VSKx41/04 to VS-VSKx41/17	Two SCRs common cathode-anode	400 to 1600	45	85	1.81	141	850
	VS-VSKx56/04 to VS-VSKx56/16	SCR / diode common anodes, doubler positive-negative control, two SCRs doubler	400 to 1600	60	85	1.7	188	1200
	VS-VSKx56/04 to VS-VSKx56/17	Two SCRs common cathodes-anodes	400 to 1600	60	85	1.7	188	1200
	VS-VSKx71/04 to VS-VSKx71/16	SCR / diode common anodes, doubler positive-negative control, two SCRs doubler	400 to 1600	75	85	1.72	236	1300
	VS-VSKx71/04 to VS-VSKx71/16	Two SCRs common cathodes-anodes	400 to 1600	75	85	1.72	236	1300
	VS-VSKx91/04 to VS-VSKx91/16	SCR / diode common anodes, doubler positive-negative control, two SCRs doubler	400 to 1600	95	85	1.73	298	2000
	VS-VSKx91/04 to VS-VSKx91/16	Two SCRs common cathodes-anodes	400 to 1600	95	85	1.73	298	2000
	VS-VSKx105/04 to VS-VSKx105/16	SCR / diode common anodes, doubler positive-negative control, two SCRs doubler	400 to 1600	105	85	1.8	330	2000
VS-VSKx105/04 to VS-VSKx105/16	Two SCRs common cathodes-anodes	400 to 1600	105	85	1.8	330	2000	
 SOT-227 (isolated)	VS-TA60DA160	Two SCRs, back to back	1600	60	110	1.5	60	850



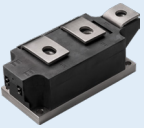


POWER MODULES

Thyristor Modules

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Thyristor Modules - Dual, continued

Package	Device	Type	V _{RRM} Range (V)	I _{T(AV)} per SCR at T _C		Max. V _T at I _T		I _{TSM} (A)
				(A)	(°C)	(V)	(A)	
 INT-A-PAK (isolated)	VS-VSKT152/04PbF	Two SCRs doubler circuit	400	150	85	1.48	471	4000
	VS-VSKx136/04PbF to VS-VSKx136/16PbF	SCR / diode doubler positive-negative control, two SCRs doubler	400 to 1600	135	85	1.57	424	3200
	VS-VSKx142/04PbF to VS-VSKx142/16PbF	SCR / diode doubler positive-negative control, two SCRs doubler	400 to 1600	140	85	1.54	440	4870
	VS-VSKx162/04PbF to VS-VSKx162/16PbF	SCR / diode doubler positive-negative control, two SCRs doubler	400 to 1600	160	85	1.54	503	4870
	VS-VSKx162/12PbF to VS-VSKx162/16PbF	Two SCRs common cathodes-anodes	1200 to 1600	160	85	1.54	503	4870
	VS-VSKL300/08PbF	SCR / diode doubler circuit, negative control	800	300	53	1.35	942	6500
 MAGN-A-PAK (isolated)	VS-VSKx170-04PbF to VS-VSKx170-16PbF	SCR / diode common cathodes, doubler positive-negative control, two SCRs doubler	400 to 1600	170	85	1.6	534	5100
	VS-VSKL230-08PbF to VS-VSKL230-20PbF	SCR / diode common cathodes, doubler positive-negative control, two SCRs doubler	800 to 2000	230	85	1.59	723	7500
	VS-VSKx250-04PbF to VS-VSKx250-20PbF	SCR / diode common cathodes, doubler positive-negative control, two SCRs doubler	400 to 2000	250	85	1.44	785	8500
	VS-VSKT320-12PbF, VS-VSKT320-16PbF	Two SCRs doubler circuit	1200 to 1600	320	70	1.4	750	9000
	VS-VSKH320-16PbF	SCR / diode doubler circuit, positive control	1600	320	70	1.5	1005	9000
 Super MAGN-A-PAK (isolated)	VS-VSKT570-16PbF	SCR / diode doubler circuit	1600	570	85	1.36	1500	18 000
	VS-VSKH570-16PbF	Two SCRs doubler circuit	1600	570	85	1.36	1500	18 000
	VS-VSKT570-18PbF	SCR / diode doubler circuit	1800	570	74	1.5	1500	17 800
	VS-VSKH570-18PbF	Two SCRs doubler circuit	1800	570	74	1.5	1500	17 800
	VS-VSKx500-08PbF to VS-VSKx500-16PbF	SCR / diode doubler, positive-negative control, two SCRs doubler	800 to 1600	500	82	1.5	1500	17 800



POWER MODULES

Bridge Rectifier Modules

The DNA of tech.®

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 centertapped 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 package styles and configurations with diode and / or thyristor technologies
- Direct mounting on heatsinks
- Compact case styles for screw, solderable pin, and fast-on plug terminations
- PressFit pins 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

OPTIONS

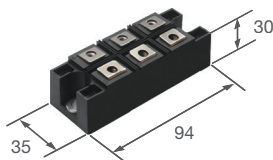
- Customizable for specific application needs
- Temperature sensor available in some package styles

APPLICATIONS

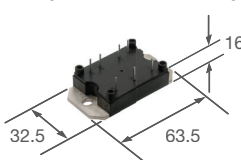
- Single- and three-phase input rectification

DIMENSIONS in millimeters

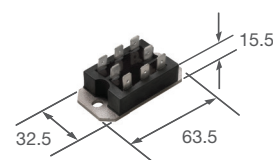
MTK



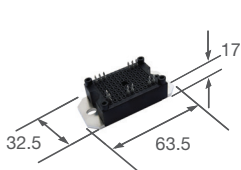
MTP (Solderable Pins)



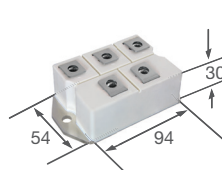
Pace-Pak



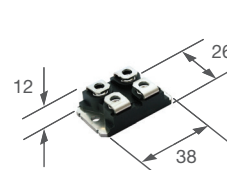
MTP (PressFit pins)



MTC



SOT-227



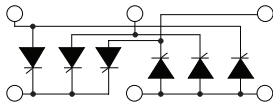


POWER MODULES

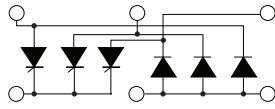
Bridge Rectifier Modules

The DNA of tech.®

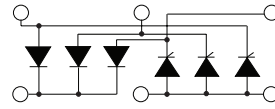
Bridge Rectifier Modules - Standard Recovery



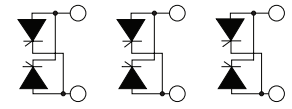
VS-...1MT..K



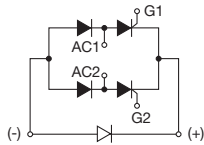
VS-...2MT..K



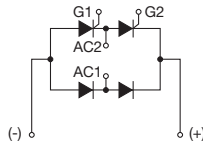
VS-...3MT..K



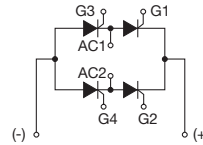
VS-...4MT..K



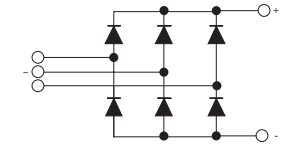
VS-P..0..(KW)



VS-P..2..



VS-P..3..



Three Phase Diode Bridge

Package	Device	Type	V _{RRM} Range (V)	I _o at T _C		Max. V _F at I _F	
				(A)	(°C)	(V)	(A)
 <p>MTK (isolated)</p>	VS-40MT160KPbF	Three-phase diode bridge	1600	40	85	2.02	100
	VS-51MT80KPbF to VS-51MT160KPbF	Negative half-controlled bridge	800 to 1600	55	85	2.68	150
	VS-52MT80KPbF to VS-52MT160KPbF	Positive half-controlled bridge	800 to 1600	55	85	2.68	150
	VS-53MT80KPbF to VS-53MT160KPbF	Full-controlled bridge	800 to 1600	55	85	2.68	150
	VS-60MT80KPbF to VS-60MT160KPbF	Three-phase diode bridge	800 to 1600	60	85	1.75	100
	VS-70MT80KPbF to VS-70MT160KPbF	Three-phase diode bridge	800 to 1600	70	85	1.55	100
	VS-90MT80KPbF to VS-90MT160KPbF	Three-phase diode bridge	800 to 1600	90	90	1.6	150
	VS-91MT80KPbF to VS-91MT160KPbF	Negative half-controlled bridge	800 to 1600	90	85	1.65	150
	VS-92MT80KPbF to VS-92MT160KPbF	Positive half-controlled bridge	800 to 1600	90	85	1.65	150
	VS-93MT80KPbF to VS-93MT160KPbF	Full-controlled bridge	800 to 1600	90	85	1.65	150
	VS-104MT80KPbF to VS-104MT160KPbF	Three-phase AC switch	800 to 1600	100	80	1.53	150
	VS-110MT80KPbF to VS-110MT160KPbF	Three-phase diode bridge	800 to 1600	110	90	1.4	150
	VS-111MT80KPbF to VS-111MT160KPbF	Negative half-controlled bridge	800 to 1600	110	85	1.57	150
	VS-112MT80KPbF to VS-112MT160KPbF	Positive half-controlled bridge	800 to 1600	110	85	1.57	150
	VS-113MT80KPbF to VS-113MT160KPbF	Full-controlled bridge	800 to 1600	110	85	1.57	152
	VS-130MT80KPbF to VS-130MT160KPbF	Three-phase diode bridge	800 to 1600	130	85	1.63	200
	VS-160MT80KPbF to VS-160MT160KPbF	Three-phase diode bridge	800 to 1600	160	85	1.49	200
	VS-200MT40KPbF	Three-phase diode bridge	400	200	85	1.4	200



POWER MODULES

Bridge Rectifier Modules

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Bridge Rectifier Modules - Standard Recovery, continued

Package	Device	Type	V _{RRM} Range (V)	I _o at T _c		Max. V _F at I _F	
				(A)	(°C)	(V)	(A)
 MTC (isolated)	VS-131MT160C and VS-131MT180C	Three-phase diode bridge	1600 to 1800	130	120	2.05	300
	VS-161MT160C and VS-161MT180C	Three-phase diode bridge	1600 to 1800	160	118	1.85	300
	VS-301MT160C and VS-301MT180C	Three-phase diode bridge	1600 to 1800	300	100	1.54	240
 MTP Solderable (isolated)	VS-40MT160P.PbF	Three-phase diode bridge	1600	45	100	1.45	40
	VS-70MT160P.PbF	Three-phase diode bridge	1600	75	80	1.45	70
	VS-100MT160P.PbF	Three-phase diode bridge	1600	100	80	1.51	100
 MTP PressFit (isolated)	VS-40MT160P-P	Three-phase diode bridge	1600	45	100	1.45	40
	VS-70MT160P-P	Three-phase diode bridge	1600	75	80	1.45	70
	VS-100MT160P-P	Three-phase diode bridge	1600	100	80	1.51	100
 PACE-PAK (D-19) (isolated)	VS-P101 to VS-P105	Single-phase, hybrid-bridge common cathode	400 to 1200	25	85	1.35	79
	VS-P121 to VS-P125	Single-phase, hybrid-bridge doubler connection	400 to 1200	25	85	1.35	79
	VS-P131 to VS-P135	Single-phase, all SCR bridge	400 to 1200	25	85	1.35	79
	VS-P401 to VS-P405	Single-phase, hybrid-bridge common cathode	400 to 1200	40	80	1.4	126
	VS-P421 to VS-P425	Single-phase, hybrid-bridge doubler connection	400 to 1200	40	80	1.4	126
	VS-P431 to VS-P435	Single-phase, all SCR bridge	400 to 1200	40	80	1.4	126

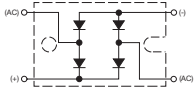


POWER MODULES


Bridge Rectifier Modules

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Bridge Rectifier Modules - Fast and Ultrafast Recovery



VS-...BA...

Package	Device	Type	V _{RRM} Range (V)	I _o at T _c		Max. V _F at I _F		Typ. t _{rr} at 25 °C (ns)	Typ. Q _{rr} at 125 °C (nC)	Setup
				(A)	(°C)	(V)	(A)			
 SOT-227 (isolated)	VS-SA61BA60	Single-phase bridge	600	61	57	1.33	30	170	1970	20 A, 100 A/μs, 30 V
	VS-U5FH30BA60	Single-phase bridge	600	30	105	2.1	30	57	900	30 A, 1000 A/μs, 400 V
	VS-UFH60BA65	Single-phase bridge	650	60	123	2.35	60	63	765	50 A, 200 A/μs, 200 V



The DNA of tech.®

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

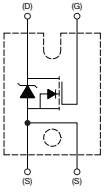


POWER MODULES

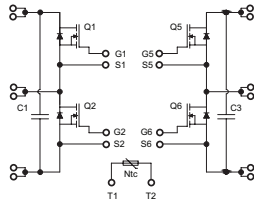
MOSFET Modules

The DNA of tech.®

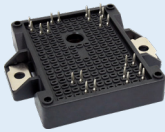

MOSFET Modules



VS-FC...SA...
VS-FA...SA...



Full-Bridge Inverter

Package	Device	Type	V _{DSS} (V)	I _b at T _c		R _{DS(on)} (mΩ)	Q _G (nC)
				(A)	(°C)		
 EMIPAK 2B (isolated)	VS-ETY020P120F	Full-bridge inverter	1200	26	80	71	105
 SOT-227 (isolated)	VS-FC420SA10	Single switch	100	330	90	1.3	375
	VS-FC420SA15	Single switch	150	300	90	1.93	250
	VS-FC270SA20	Single switch	200	219	90	3.3	250
	VS-FA40SA50LC	Single switch	500	29	90	106	280



The DNA of tech.®

High efficiency IGBT modules from Vishay Intertechnology feature Trench IGBT technologies in industry-standard outlines. 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 heatsink. 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

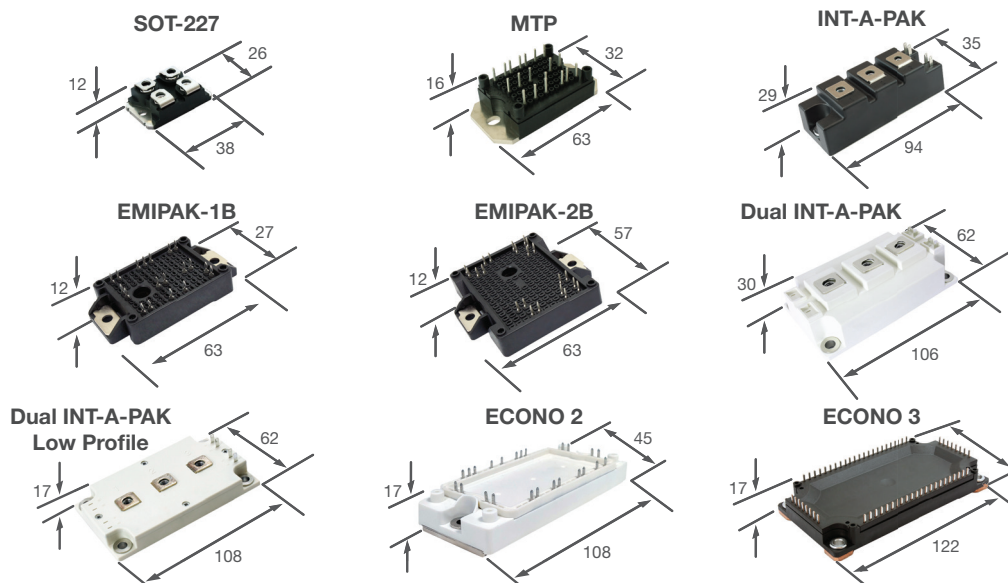
- Wide range of industry-standard package styles
- Direct mount on heatsink
- Low $V_{CE(on)}$ IGBT
- Switching frequency from DC to 150 kHz
- Optimized anti-parallel ultrafast diode with soft recovery characteristics
- Rugged transient performance
- High isolation voltage up to 3500 V
- 100 % lead (Pb)-free and RoHS-compliant
- Low thermal resistance
- Wide operating temperature range (-40 °C to +175 °C)
- UL-approved
- PressFit pins technology available on selected packages

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

The DNA of tech.®

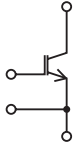
IGBT Modules

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)
	SOT-227	38 x 26 x 12	Screwable	Single switch	600 to 1200	50 to 250	DC to 150
				Chopper			
				Customized configuration			
	MTP	63 x 32 x 16	Solderable / PressFit	Half bridge	600 to 1200	Up to 50	Up to 60
				Full bridge			
				Customized configuration			
	EMIPAK-1B	63 x 34 x 12	PressFit	Customized configurations	600 to 1200	Up to 55	Up to 80
	EMIPAK-2B	63 x 57 x 12	PressFit	Customized configurations	600 to 1200	Up to 160	Up to 80
	IAP (INT-A-PAK)	94 x 35 x 29	Screwable	Half bridge	600	100 to 400	DC to 60
				Customized configuration			
	ECONO 2	108 x 45 x 17	Solderable	4 pack	1200	Up to 100	Up to 60
				Customized configuration			
	ECONO 3	122 x 62 x 17	Solderable	4 pack	1200	Up to 200	8 to 60
	DIAP (Dual INT-A-PAK)	106 x 62 x 30	Screwable	Half bridge	600 to 1200	Up to 300	Up to 30
				Chopper			
				Customized configuration			
	DIAP LP (Dual INT-A-PAK Low Profile)	108 x 62 x 17	Screwable	Half bridge	600	Up to 750	DC to 1
				Current fed inverter			
				Customized configuration			

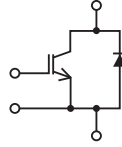


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Single-Switch IGBT Modules



Single-Switch No Diode



Single-Switch With AP Diode

Package	Device	Type	V _{CES} (V)	I _C at T _C		V _{CE(on)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 <p>SOT-227 (isolated)</p>	VS-GT80DA60U	Single switch with AP diode	600	85	90	1.83	2.3	1.43	8 to 30
	VS-GT90DA60U	Single switch with AP diode	600	92	90	1.64	1.81	1	8 to 30
	VS-GT250SA60S	Single switch no diode	600	250	90	1.16	2.03	9.65	DC to 1
	VS-GT80DA120U	Single switch with AP diode	1200	93	90	2	3.9	5.5	8 to 30
	VS-GT90DA120U	Single switch with AP diode	1200	106	90	2.17	2.23	3.87	8 to 30
	VS-GT90SA120U	Single switch no diode	1200	106	90	2.17	2.23	3.87	8 to 30
	VS-GT100DA120UF	Single switch with AP diode	1200	123	90	1.93	3.9	7.1	8 to 30
	VS-GT180DA120U	Single switch with AP diode	1200	185	90	1.55	5.7	11.6	8 to 30

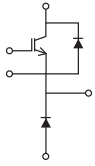


POWER MODULES

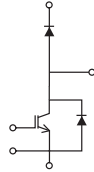
IGBT Modules

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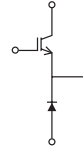
Chopper IGBT Modules



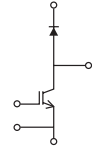
High Side Chopper
(With A/P Diode)





Low Side Chopper
(With A/P Diode)



High Side Chopper
(VS-GT...NA...)



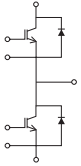
Low Side Chopper
(VS-GT...LA...)

Package	Device	Type	V _{CES} (V)	I _C at T _C		V _{CE(on)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 SOT-227 (isolated)	VS-GT50LA65UF	Low side chopper	650	44	80	1.7	0.68	0.27	Up to 150
	VS-GT55LA120UX	Low side chopper	1200	47	80	2.39	4.1	2.3	8 to 60
	VS-GT55NA120UX	High side chopper	1200	47	80	2.39	4.1	2.3	8 to 60
	VS-GT75LA60UF	Low side chopper	600	61	80	1.79	0.95	0.53	Up to 150
	VS-GT75NA60UF	High side chopper	600	61	80	1.79	0.95	0.53	Up to 150
	VS-GT100LA65UF	Low side chopper	650	70	80	1.72	3.16	0.72	Up to 150
 Dual INT-A-PAK (isolated)	VS-GT400LH060N	Low side chopper	600	375	80	1.67	17.2	21.2	n/a

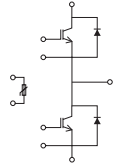


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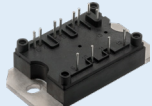
Half-Bridge IGBT Modules



Half Bridge



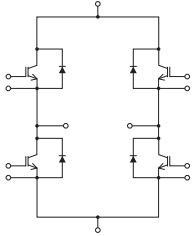
Half Bridge With Thermistor
(VS-...MT...PHTAPbF)

Package	Device	Type	V _{CES} (V)	I _C at T _C		V _{CE(on)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 Dual INT-A-PAK low profile (isolated)	VS-GT300TD60S	Half bridge	600	349	80	1.15	2	20	DC to 1
	VS-GT400TD60S	Half bridge	600	532	80	1.14	2.2	27.6	DC to 1
 Dual INT-A-PAK (isolated)	VS-GT600TH60S	Half bridge	600	565	80	1.36	39	53	DC to 1
 INT-A-PAK (isolated)	VS-GT100TS065N	Half bridge	650	72	80	1.82	3.2	1	8 to 30
	VS-GT200TS065N	Half bridge	650	144	80	1.83	2.82	3.86	8 to 30
	VS-GT100TS065S	Half bridge	650	185	80	1.05	0.5	6.5	DC to 1
	VS-GT150TS065S	Half bridge	650	280	80	1.07	0.7	10.3	DC to 1
	VS-GT200TS065S	Half bridge	650	378	80	1.09	1.1	13.7	DC to 1
 MTP Solderable (isolated)	VS-50MT060PHTAPbF	Half bridge	600	50	117	1.41	1.46	0.62	30 to 100
	VS-40MT120PHAPbF	Half bridge	1200	40	102	2.24	1.02	1.83	8 to 30

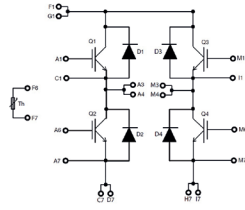


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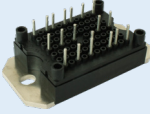
Full-Bridge IGBT Modules



Full Bridge
(VS-...MT...PFP)



Full Bridge With Thermistor
(VS-...MT...TFT)

Package	Device	Type	V _{CES} (V)	I _C at T _C		V _{CE(ON)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 MTP Solderable (isolated)	VS-50MT060TFT	Full bridge	600	41	80	1.81	0.53	0.31	30 to 100
	VS-20MT120PFP	Full bridge	1200	42	80	1.84	1.08	1.18	8 to 30

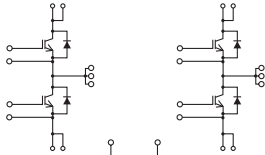


POWER MODULES



IGBT Modules

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4-Pack IGBT Modules



4 Pack

Package	Device	Type	V _{CES} (V)	I _C at T _C		V _{CE(on)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 ECONO 2 (isolated)	VS-GT50YF120NT	4 pack	1200	44	80	2.34	1.58	2.52	8 to 30
	VS-GT75YF120NT	4 pack	1200	81	80	2.2	3.35	4.28	8 to 30
	VS-GT75YF120UT	4 pack	1200	81	80	2.2	3.17	4.23	8 to 30
 ECONO 3 (isolated)	VS-GT100YG120UT	4 pack	1200	115	80	2.12	4.09	5.67	n/a
	VS-GT150YG120NT	4 pack	1200	166	80	2.18	5.26	8.6	n/a

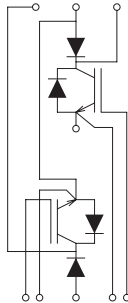


POWER MODULES


IGBT Modules

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Inverter IGBT Modules



Current-Fed Inverter Topology

Package	Device	Type	V _{CES} (V)	I _c at T _c		V _{CE(on)} at 25 °C (V)	E _{on} at 125 °C (mJ)	E _{off} at 125 °C (mJ)	Reference Speed (kHz)
				(A)	(°C)				
 Dual INT-A-PAK (isolated)	VS-GT300YH120N	Current-fed inverter topology	1200	300	80	1.93	33.2	37.4	4 to 30



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POWER MODULES

Automotive Modules

Automotive modules in the EMIPAK 1B package offer a modular and compact off the shelf solution for on-board chargers. Each module can also be used in different stages for industrial applications.

FEATURES

- Several circuit configurations in a modular “ready to go” solution implementing proven automotive technology for on-board chargers
- Compliancy with the AQG-324 automotive guideline
- Compact module with a complex circuit configuration

APPLICATIONS

- HEV / EV, low speed electrical vehicles, on-board chargers
- Battery charging, DC/DC conversion (including power train)
- Welding (PFC + primary stage), plasma cutting (output stage)
- UPS, rail power supply
- Solar inverters, wind turbines (pitch control / aux power), fuel-cell DC/DC power conversion
- Smart grid management / active filters
- Large battery systems, electrolytic and electrostatic storage, hydrogen storage




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POWER MODULES

Automotive Modules

Automotive Modules

Package	Device	Circuit Configuration	Main Features
 <p>EMIPAK 1B (isolated)</p>	VS-ENK025C65S	MOSFET dual-boost PFC and MOSFET full-bridge inverter	<ul style="list-style-type: none"> 650 V class V_{BR} rating 6x 63 mΩ MOSFETs, 2x 10 A SiC diodes, NTC
	VS-ENM040M60P	Half-controlled input bridge plus MOSFET boost PFC leg and MOSFET half-bridge inverter	<ul style="list-style-type: none"> 650 V class V_{BR} rating 40 A input bridge 33 mΩ MOSFETs for improved efficiency 30 A SiC boost diode
	VS-ENV020F65U	6x independent ultrafast rectifiers legs for output rectification	<ul style="list-style-type: none"> 650 V class V_{BR} rating 12x 20 A 650 V FRED G2 U-type (G5 H-type option)
	VS-ENV020M120M	6x independent diodes legs for AC line input rectification	<ul style="list-style-type: none"> 1200 V class V_{BR} rating 12x 20 A 1200 V MOAT input rectifiers
	VS-ENW30S120T	SiC diodes full bridge	<ul style="list-style-type: none"> 1200 V class V_{BR} rating 4x 30 A SiC diodes
	VS-ENY050C60	MOSFET full-bridge inverter	<ul style="list-style-type: none"> 600 V class V_{BR} rating 4x 37 mΩ MOSFETs feat. fast body diodes
	VS-ENZ025C60N	Double-interleaved bridgless PFC (4x channels) with individual return diodes	<ul style="list-style-type: none"> 600 V class V_{BR} rating 4x 56 mΩ MOSFETs, 4x 10 A SiC diodes, 2x low V_F diodes, NTC