



DIODES

FRED Pt® and HEXFRED®

AEC-Q101 Qualified FRED Pt® and HEXFRED® Ultrafast Recovery Rectifiers and Soft Recovery Diodes



KEY BENEFITS

- Wide variety of package options
 - DPAK, D²PAK, eSMP® packages, SMA, SMB, SMC, TO-220, TO-262, TO-247, Modified TO-247, TO-247 Long Lead 2 pins/3 pins
- Forward currents from 1 A to 150 A
- Reverse currents from 100 V to 1200 V
- Fast recovery times down to 14 ns
- Low forward drop
- Soft recovery characteristics at high di/dt
- Low leakage current
- AEC-Q101 qualified
- High operating junction temperature from to +175 °C (FRED Pt® rectifiers)
- RoHS-compliant, halogen-free, and totally lead (Pb)-free

APPLICATIONS

- ECU systems
- AC/DC, DC/DC, and auxiliary and traction inverters in full hybrid and mild hybrid vehicle systems
- HID lighting and ABS systems
- Fast battery charging systems and main inverter applications up to 20 kW

RESOURCES

- For technical questions contact: rectifiers@vishay.com
- Material categorization: For definitions of compliance, please see <http://www.vishay.com/doc?99912>





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FRED Pt® (Fast Recovery Epitaxial Diodes) are based on Pt doping technology that allows maximum junction temperatures up to 175 °C. By providing a high level of flexibility in the devices V_F / Q_{rr} ratio, FRED Pt devices can be used in all major applications from 1 A to 150 A. FRED Pt devices are offered in plastic packages using chips that are also available as bare die.

FRED Pt AEC-Q101 automotive devices have undergone part average testing (PAT) and statistical yield limit (SYL) analysis to ensure that their electrical parameters meet the highest quality level for automotive applications. Automotive FRED Pt devices feature a dedicated die and part number. They are suitable for battery charging systems, EH / HEV vehicles, HID lighting, and other automotive applications.

I _{F(AV)} (A)	Part Number	Package		V _(BR) Range (V)	V _F @ I _F		I _R @ V _{RRM} (µA)	T _{rr} (µs)	I _{FSM} (A)	T _J max (°C)
		Family	Type		(V)	(A)				
1	VS-1EFH01HM3/I	Plastic SMD	SMF (DO-219AB)	100	0.74	1	2	25	35	175
1	VS-1EFH02HM3/I	Plastic SMD	SMF (DO-219AB)	200	0.74	1	2	25	35	175
1	VS-1EFU06HM3/I	Plastic SMD	SMF (DO-219AB)	600	0.83	1	3	55	30	175
1	VS-1EMH01HM3	Plastic SMD	SMA (DO-214AC)	100	0.68	1	2	25	50	175
1	VS-1EMH02HM3	Plastic SMD	SMA (DO-214AC)	200	0.68	1	2	25	50	175
2	VS-2EFH01HM3/I	Plastic SMD	SMF (DO-219AB)	100	0.75	2	2	25	50	175
2	VS-2EFH02HM3/I	Plastic SMD	SMF (DO-219AB)	200	0.75	2	2	25	50	175
2	VS-2EFU06HM3/I	Plastic SMD	SMF (DO-219AB)	600	0.95	2	3	55	30	175
2	VS-2EGH02HM3	Plastic SMD	SMB (DO-214AA)	200	0.66	2	2	24	70	175
2	VS-2EJH01HM3	Plastic SMD	SlimSMA (DO-221AC)	100	0.72	2	2	25	65	175
2	VS-2EJH02HM3	Plastic SMD	SlimSMA (DO-221AC)	200	0.72	2	2	25	65	175
2	VS-2EMH01HM3	Plastic SMD	SMA (DO-214AC)	100	0.75	2	2	25	50	175
2	VS-2EMH02HM3	Plastic SMD	SMA (DO-214AC)	200	0.75	2	2	25	50	175
3	VS-3ECH01HM3	Plastic SMD	SMC (DO-214AB)	100	0.69	3	2	25	130	175
3	VS-3ECH02HM3	Plastic SMD	SMC (DO-214AB)	200	0.69	3	2	25	130	175
3	VS-3EGU06WHM3	Plastic SMD	SMB (DO-214AA)	600	0.99	3	3	41	55	175
3	VS-3EJH01HM3	Plastic SMD	SlimSMA (DO-221AC)	100	0.74	3	2	30	85	175
3	VS-3EJH02HM3	Plastic SMD	SlimSMA (DO-221AC)	200	0.74	3	2	30	85	175
3	VS-3EJU06HM3	Plastic SMD	SlimSMA (DO-221AC)	600	1.15	3	3	45	43	175
4	VS-4CSH01HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	100	0.75	2	2	24	90	175
4	VS-4CSH02HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	200	0.75	2	2	24	90	175
4	VS-4ESH01HM3	Power-pack SMD	SMPC (TO-277A)	100	0.73	4	2	27	130	175
4	VS-4ESH02HM3	Power-pack SMD	SMPC (TO-277A)	200	0.73	4	2	27	130	175
4	VS-4EWH02FNHM3	Power-pack SMD	D-PAK (TO-252AA)	200	0.71	4	3	23	80	175
5	VS-5EWH06FNHM3	Power-pack SMD	D-PAK (TO-252AA)	600	1.85	5	5	18	70	175
6	VS-6CSH01HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	100	0.75	3	2	27	150	175
6	VS-6CSH02HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	200	0.75	3	2	27	150	175
6	VS-6CWH02FNHM3	Power-pack SMD ⁽²⁾	D-PAK (TO-252AA)	200	0.9	3	5	20	50	175
6	VS-6ESH01HM3	Power-pack SMD	SMPC (TO-277A)	100	0.74	6	2	28	150	175
6	VS-6ESH02HM3	Power-pack SMD	SMPC (TO-277A)	200	0.74	6	2	28	150	175
6	VS-6ESH06HM3	Power-pack SMD	SMPC (TO-277A)	600	1.05	6	5	33	90	175
6	VS-6ESU06HM3	Power-pack SMD	SMPC (TO-277A)	600	0.95	6	5	42	120	175
6	VS-6EWH06FNHM3	Power-pack SMD	D-PAK (TO-252AA)	600	1.26	6	5	18	70	175
6	VS-6EWX06FNHM3	Power-pack SMD	D-PAK (TO-252AA)	600	1.65	6	20	14	50	175
6	VS-MURD620CTHM3	Power-pack SMD ⁽²⁾	D-PAK (TO-252AA)	200	0.96	3	5	20	50	175
8	VS-8CSH01HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	100	0.72	4	2	25	130	175
8	VS-8CSH02HM3	Power-pack SMD ⁽²⁾	SMPC (TO-277A)	200	0.72	4	2	25	130	175
8	VS-8CWH02FNHM3	Power-pack SMD ⁽²⁾	D-PAK (TO-252AA)	200	0.95	4	4	23	80	175
8	VS-8ETH06-1HM3	Plastic Power-pack	TO-262AA	600	1.3	8	50	18	90	175



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		Family	Type		(V)	(A)				
8	VS-8ETH06HN3	Plastic Power-pack	TO-220AC	600	1.3	8	50	18	90	175
8	VS-8ETH06SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.3	8	50	18	90	175
8	VS-8ETU04-1HM3	Plastic Power-pack	TO-262AA	400	0.94	8	10	35	100	175
8	VS-8ETU04HN3	Plastic Power-pack	TO-220AC	400	0.94	8	10	35	100	175
8	VS-8ETU04SHM3	Power-pack SMD	D2PAK (TO-263AB)	400	0.94	8	10	35	100	175
8	VS-8ETU12HN3	Plastic Power-pack	TO-220AC	1200	1.95	8	55	42	80	175
8	VS-8EWH06FNHM3	Power-pack SMD	D-PAK (TO-252AA)	600	1.3	8	50	18	90	175
8	VS-MURB820-1HM3	Plastic Power-pack	TO-262AA	200	0.75	8	5	19	100	175
8	VS-MURB820HM3	Power-pack SMD	D2PAK (TO-263AB)	200	0.75	8	5	19	100	175
10	VS-10CDH06HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	600	1	5	3	35	110	175
10	VS-10CSH01HM3	Power-pack SMD ⁽²⁾	SMPD (TO-277A)	100	0.75	5	2	25	130	175
10	VS-10CSH02HM3	Power-pack SMD ⁽²⁾	SMPD (TO-277A)	200	0.75	5	2	25	130	175
10	VS-MURB1020CT-1HM3	Plastic Power-pack ⁽²⁾	TO-262AA	200	0.87	5	5	19	50	175
10	VS-MURB1020CTHM3	Power-pack SMD ⁽²⁾	D2PAK (TO-263AB)	200	0.87	5	5	19	50	175
12	VS-12CDU06HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	600	0.89	6	5	45	200	175
15	VS-15ETH06HN3	Plastic Power-pack	TO-220AC	600	1.3	15	50	22	120	175
15	VS-15ETL06HN3	Plastic Power-pack	TO-220AC	600	0.85	15	10	60	250	175
15	VS-15ETU12HN3	Plastic Power-pack	TO-220AC	1200	2.25	15	80	44	150	175
15	VS-ETH1506-1HM3	Plastic Power-pack	TO-262AA	600	1.25	15	15	21	160	175
15	VS-ETH1506SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.25	15	15	21	160	175
15	VS-ETL1506-1HM3	Plastic Power-pack	TO-262AA	600	0.85	15	15	60	200	175
15	VS-ETL1506SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	0.85	15	15	60	200	175
15	VS-ETU1506-1HM3	Plastic Power-pack	TO-262AA	600	1.1	15	15	24	160	175
15	VS-ETU1506SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.1	15	15	24	160	175
16	VS-16CDH02HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	200	0.77	8	2	27	190	175
16	VS-16CDU06HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	600	0.94	8	5	45	200	175
16	VS-16CTU04HN3	Plastic Power-pack ⁽²⁾	TO-220AB	400	0.94	8	10	24	100	175
16	VS-16EDH02HM3/1	Power-pack SMD	SMPD (TO-263AC)	200	0.75	16	15	32	250	175
16	VS-16EDU06HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	600	0.91	16	15	55	160	175
16	VS-MURB1620CT-1HM3	Plastic Power-pack ⁽²⁾	TO-262AA	200	0.895	8	5	19	100	175
16	VS-MURB1620CTHM3	Power-pack SMD ⁽²⁾	D2PAK (TO-263AB)	200	0.895	8	5	19	100	175
20	VS-20CDH02HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	200	0.77	10	2	25	210	175
20	VS-20CTH03-1HM3	Plastic Power-pack ⁽²⁾	TO-262AA	300	0.85	10	20	23	120	175
20	VS-20CTH03SHM3	Power-pack SMD ⁽²⁾	D2PAK (TO-263AB)	300	0.85	10	20	23	120	175
20	VS-MURB2020CT-1HM3	Plastic Power-pack ⁽²⁾	TO-262AA	200	0.85	10	5	19	100	175
20	VS-MURB2020CTHM3	Power-pack SMD ⁽²⁾	D2PAK (TO-263AB)	200	0.85	10	5	19	100	175
30	VS-30CDU06HM3/1	Power-pack SMD ⁽²⁾	SMPD (TO-263AC)	600	0.9	15	15	55	300	175
30	VS-30CPU04HN3	Plastic Power-pack ⁽²⁾	TO-247AB	400	0.93	15	10	36	200	175
30	VS-30EPH06HN3	Plastic Power-pack	TO-247AC	600	1.34	30	50	28	300	175
30	VS-30EPU12LHN3	Plastic Power-pack	TO-247AD	1200	2.05	30	145	49	300	175
30	VS-APH3006HN3	Plastic Power-pack	TO-247AC	600	1.4	30	30	27	220	175
30	VS-APU3006HN3	Plastic Power-pack	TO-247AC	600	1.15	30	30	30	220	175
30	VS-EPH3006HN3	Plastic Power-pack	TO-247AC	600	1.4	30	30	27	220	175
30	VS-EPU3006HN3	Plastic Power-pack	TO-247AC	600	1.15	30	30	30	220	175
30	VS-ETH3006-1HM3	Plastic Power-pack	TO-262AA	600	1.4	30	30	27	180	175
30	VS-ETH3006SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.4	30	30	27	180	175
30	VS-ETU3006-1HM3	Plastic Power-pack	TO-262AA	600	1.15	30	30	30	200	175



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		Family	Type		(V)	(A)				
30	VS-ETU3006SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.15	30	30	30	200	175
30	VS-APH3006LHN3	Plastic Power-pack	TO-247AD	600	1.4	30	30	26	240	175
30	VS-C4PU3006LHN3	Plastic Power-pack ⁽²⁾	TO-247AD	600	1.35	15	15	60	200	175
30	VS-C4PH3006LHN3	Plastic Power-pack ⁽²⁾	TO-247AD	600	1.35	15	15	50	200	175
30	VS-E4PH3006LHN3	Plastic Power-pack	TO-247AD	600	1.4	30	50	55	240	175
30	VS-E4PU3006LHN3	Plastic Power-pack	TO-247AD	600	1.2	30	50	65	240	175
30	VS-APU3006LHN3	Plastic Power-pack	TO-247AD	600	1.15	30	30	30	250	175
30	VS-EPU3006LHN3	Plastic Power-pack	TO-247AD	600	1.15	30	30	30	220	175
30	VS-ETH3007THN3	Plastic Power-pack	2L TO-220AC	650	1.4	30	30	37	210	175
30	VS-ETX3007THN3	Plastic Power-pack	2L TO-220AC	650	1.6	30	30	27	210	175
30	VS-30ETU12THN3	Plastic Power-pack	2L TO-220AC	1200	2.05	30	145	49	240	175
50	VS-50EPU12LHN3	Plastic Power-pack	TO-247AD	1200	1.95	50	330	57	400	175
60	VS-60APU04HN3	Plastic Power-pack	TO-247AC	400	0.87	60	50	50	600	175
60	VS-60APU06HN3	Plastic Power-pack	TO-247AC	600	1.11	60	50	34	600	175
60	VS-60EPU04HN3	Plastic Power-pack	TO-247AC	400	0.87	60	50	50	600	175
60	VS-60EPU06HN3	Plastic Power-pack	TO-247AC	600	1.11	60	50	34	600	175
60	VS-C4PH6006LHN3	Plastic Power-pack ⁽²⁾	TO-247AD	600	1.44	30	50	55	480	175
60	VS-C4PU6006LHN3	Plastic Power-pack ⁽²⁾	TO-247AD	600	1.23	30	50	65	480	175
60	VS-CPU6006LHN3	Plastic Power-pack ⁽²⁾	TO-247AD	600	1.1	30	30	26	500	175
60	VS-E4PH6006LHN3	Plastic Power-pack	TO-247AD	600	1.4	60	50	68	425	175
60	VS-E4PU6006LHN3	Plastic Power-pack	TO-247AD	600	1.33	60	50	74	450	175
60	VS-EPU6006LHN3	Plastic Power-pack	TO-247AD	600	1.1	60	30	32	600	175
75	VS-75EPU12LHN3	Plastic Power-pack	TO-247AD	1200	1.95	75	420	62	700	175
80	VS-80EBU02HF4	Plastic Power-pack	PowerTab®	200	1.1	80	50	32	800	175
80	VS-80EBU04HF4	Plastic Power-pack	PowerTab®	400	0.92	80	50	50	800	175
80	VS-EBU8006HF4	Plastic Power-pack	PowerTab®	600	1.53	80	8	46	750	175
150	VS-150EBU02HF4	Plastic Power-pack	PowerTab®	200	0.77	150	50	34	1600	175
150	VS-150EBU04HF4	Plastic Power-pack	PowerTab®	400	0.9	150	50	60	1500	175
150	VS-EBU15006HF4	Plastic Power-pack	PowerTab®	600	1.08	150	8	50	1200	175

⁽¹⁾ Bold Text = New Products

⁽²⁾ Dual center-tapped device (V_F limit @ I_F is per diode)

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HEXFRED® devices combine ultrafast planar technology with a proprietary Schottky barrier construction that enables soft and fast recovery behavior at any di/dt condition. This characteristic makes Vishay HEXFRED products the best choice for use as the antiparallel diode for IGBTs and for power supplies operating at high switching speeds.

HEXFRED® AEC-Q101 qualified devices have undergone part average testing (PAT) and statistical yield limit (SYL) analysis to ensure that their electrical parameters meet the highest quality level for automotive applications. Automotive HEXFRED® devices feature a dedicated die and part number. They are suitable for battery charging systems, EH / HEV vehicles, HID lighting, and other automotive applications.

I _{F(AV)} (A)	Part Number	Package		V _(BR) Range (V)	V _F @ I _F		I _R @ V _{RRM} (µA)	T _{rr} (µs)	I _{FSM} (A)	T _J max (°C)
		Family	Type		(V)	(A)				
4	VS-HFA04SD60SHM3	Power-pack SMD	D-PAK (TO-252AA)	600	1.4	4	3	17	25	150
8	VS-HFA08TB120HN3	Plastic Power-pack	TO-220AC	1200	2.4	8	10	28	130	150
8	VS-HFA08TB60HN3	Plastic Power-pack	TO-220AC	600	1.4	8	5	18	60	150
16	VS-HFA16PB120HN3	Plastic Power-pack	TO-247AC	1200	2.3	16	20	30	190	150
16	VS-HFA16TB120SHM3	Power-pack SMD	D2PAK (TO-263AB)	1200	3	16	20	30	190	150
25	VS-HFA25TB60SHM3	Power-pack SMD	D2PAK (TO-263AB)	600	1.3	25	20	23	225	150
30	VS-HFA30PB120HN3	Plastic Power-pack	TO-247AC	1200	2.3	30	40	47	120	150
30	VS-HFA30TA60CHN3	Plastic Power-pack(2)	TO-220AB	600	1.2	15	10	19	150	150
50	VS-HFA50PA60CHN3	Plastic Power-pack(2)	TO-247AB	600	1.3	25	20	23	225	150

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⁽²⁾ Dual center-tapped device (V_F limit @ I_F is per diode)