

Fast Recovery Diodes (Stud Version), 6 A, 12 A, 16 A



DO-203AA (DO-4)

FEATURES

- Short reverse recovery time
- Low stored charge
- Wide current range
- Excellent surge capabilities
- Standard JEDEC® types
- Stud cathode and stud anode versions
- Fully characterized reverse recovery conditions
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

- DC power supplies
- Inverters
- Converters
- Choppers
- Ultrasonic systems
- Freewheeling diodes

PRODUCT SUMMARY

$I_{F(AV)}$	6 A, 12 A, 16 A
Package	DO-203AA (DO-4)
Circuit configuration	Single diode

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	6FL..	12FL..	16FL..	UNITS
$I_{F(AV)}$		6	12	16	A
	T_C	100	100	100	°C
$I_{F(RMS)}$		9.5	19	25	A
I_{FSM}	50 Hz	110	145	180	A
	60 Hz	115	150	190	
I^2t	50 Hz	60	103	160	A²s
	60 Hz	55	94	150	
$I^2\sqrt{t}$		1452	1452	2290	$I^2\sqrt{s}$
V_{RRM}	Range	50 to 1000	50 to 1000	50 to 1000	V
t_{rr}		See Recovery Characteristics table	See Recovery Characteristics table	See Recovery Characteristics table	ns
T_J	Range	-65 to 150	-65 to 150	-65 to 150	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	I_{RRM} MAXIMUM AT $T_J = 25\text{ °C}$ µA	I_{RRM} MAXIMUM AT $T_J = 100\text{ °C}$ mA	I_{RRM} MAXIMUM AT $T_J = 150\text{ °C}$ mA
VS-6FL..., VS-12FL..., VS-16FL..	5	50	75	50	-	6.0
	10	100	150			
	20	200	275			
	40	400	500			
	60	600	725			
	80	800	950			
	100	1000	1250			

**FORWARD CONDUCTION**

PARAMETER	SYMBOL	TEST CONDITIONS	6FL..	12FL..	16FL..	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave DC	6	12 ⁽¹⁾	16	A
Maximum RMS current	$I_{F(RMS)}$		100	100	100	°C
Maximum peak, one-cycle non-repetitive forward current	I_{FSM}	t = 10 ms No voltage reapplied t = 8.3 ms 100 % V_{RRM} reapplied Sinusoidal half wave, initial $T_J = 150\text{ °C}$	9.5	19	25	A
			130	170	215	
			135	180	225	
			110	145	180	
Maximum I^2t for fusing	I^2t	t = 10 ms No voltage reapplied t = 8.3 ms 100 % V_{RRM} reapplied Sinusoidal half wave, initial $T_J = 150\text{ °C}$	115	150 ⁽¹⁾	190	A ² s
			86	145	230	
			78	130	210	
			60	103	160	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied	55	94	150	A ² √s
Maximum forward voltage drop	V_{FM}	$T_J = 25\text{ °C}$; $I_F = \text{Rated } I_{F(AV)}$ (DC) $T_C = 100\text{ °C}$; $I_{FM} = \pi \times \text{rated } I_{F(AV)}$	856	1452	2290	A ² √s
			1.4	1.4 ⁽¹⁾	1.4	V
			1.5	1.5 ⁽¹⁾	1.5	V

Note

(1) JEDEC registered values

RECOVERY CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	6FL..., 12FL..., 16FL..		UNITS	
			S02	S05		
Maximum reverse recovery time	t_{rr}	$T_J = 25\text{ °C}$, $I_F = 1\text{ A}$ to $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$ $T_J = 25\text{ °C}$, $di_F/dt = 25\text{ A}/\mu\text{s}$, $I_{FM} = \pi \times \text{rated } I_{F(AV)}$	-	-	ns	
Maximum peak recovery current	$I_{RM(REC)}$	$I_{FM} = \pi \times \text{rated } I_{F(AV)}$	200	500	-	
Maximum reverse recovery charge	Q_{rr}	$T_J = 25\text{ °C}$, $I_F = 1\text{ A}$ to $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$ $T_J = 25\text{ °C}$, $di_F/dt = 25\text{ A}/\mu\text{s}$, $I_{FM} = \pi \times \text{rated } I_{F(AV)}$	-	-	nC	
			-	-	-	

Note

(1) JEDEC registered values

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	6FL..	12FL..	16FL..	UNITS
Maximum junction operating temperature range	T_J		- 65 to 150			°C
Maximum storage temperature range	T_{Stg}		- 65 to 175			
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	2.5	2.0	1.6	°C/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.5			
Allowable mounting torque		Not lubricated threads	1.5 + 0 - 10 % (13)			N · m (lbf · in)
		Lubricated threads	1.2 + 0 - 10 % (10)			
Approximate weight			7			g
			0.25			oz.
Case style		JEDEC	DO-203AA (DO-4)			



ΔR_{thJC} CONDUCTION								
CONDUCTION ANGLE	6FL..	12FL..	16FL..	6FL..	12FL..	16FL..	TEST CONDITIONS	UNITS
	SINUSOIDAL CONDUCTION			RECTANGULAR CONDUCTION				
180°	0.58	0.46	0.37	0.33	0.26	0.21	T _J = 150 °C	K/W
120°	0.60	0.48	0.39	0.58	0.46	0.37		
60°	1.28	1.02	0.82	1.28	1.02	0.82		
30°	2.20	1.76	1.41	2.20	1.76	1.41		

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

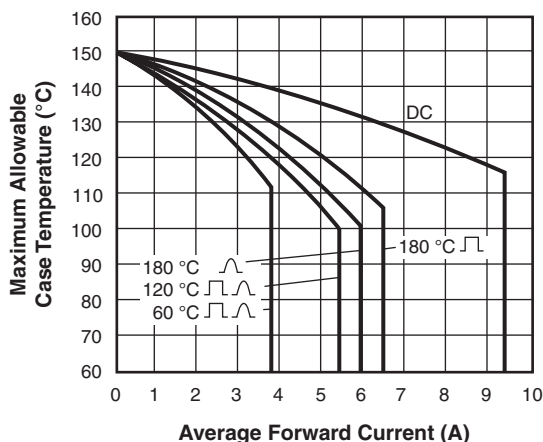


Fig. 1 - Average Forward Current vs. Maximum Allowable Case Temperature, 6FL Series

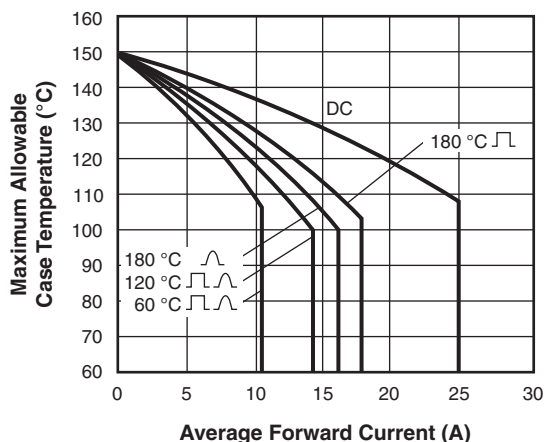


Fig. 3 - Average Forward Current vs. Maximum Allowable Case Temperature, 16FL Series

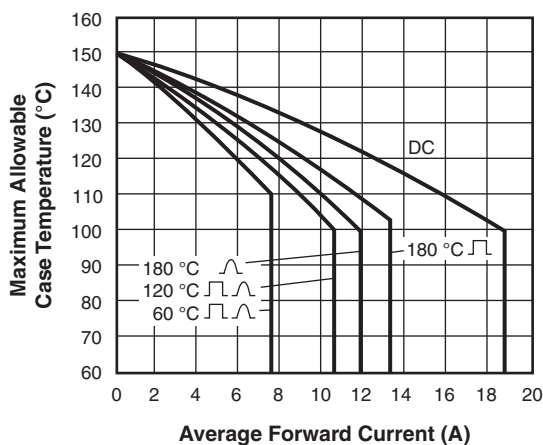


Fig. 2 - Average Forward Current vs. Maximum Allowable Case Temperature, 12FL Series

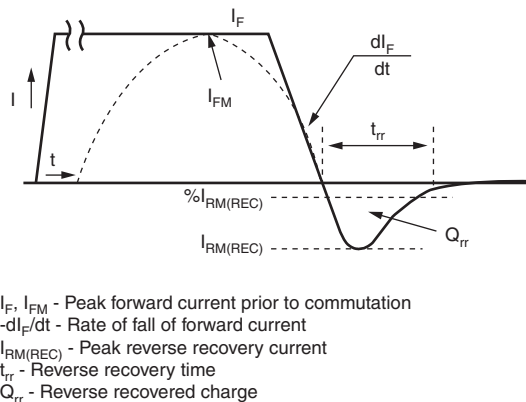


Fig. 4 - Reverse Recovery Time Test Waveform

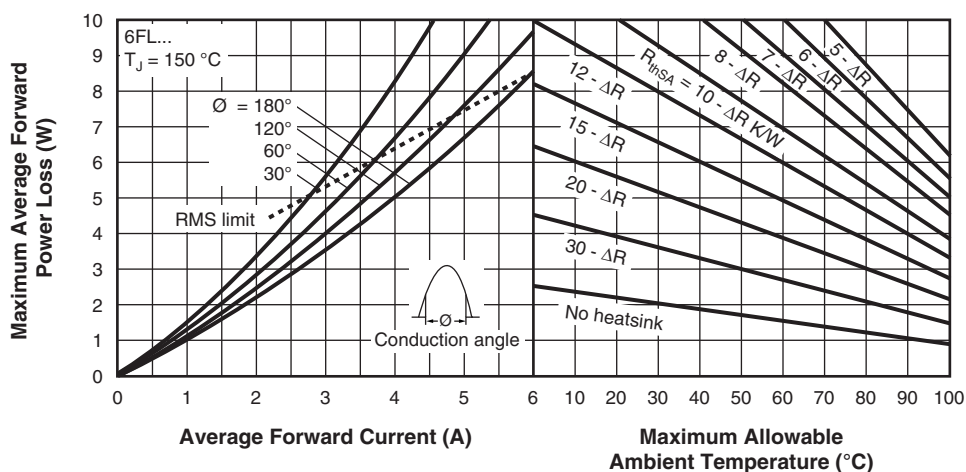


Fig. 5 - Current Rating Nomogram (Sinusoidal Waveforms), 6FL Series

Conduction angle - Φ	ΔR - KW
180°	0.58
120°	0.60
60°	1.28
30°	2.20

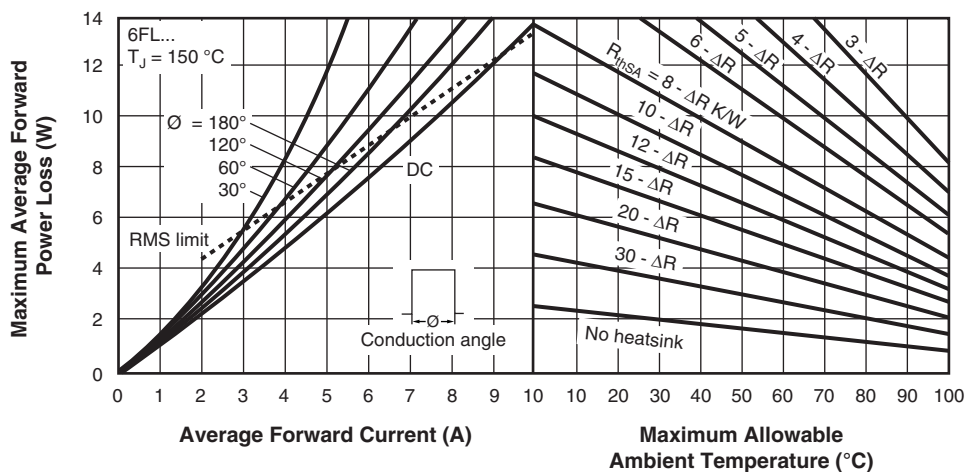


Fig. 6 - Current Rating Nomogram (Rectangular Waveforms), 6FL Series

Conduction angle - Φ	ΔR - KW
DC	0
180°	0.33
120°	0.58
60°	1.28
30°	2.20

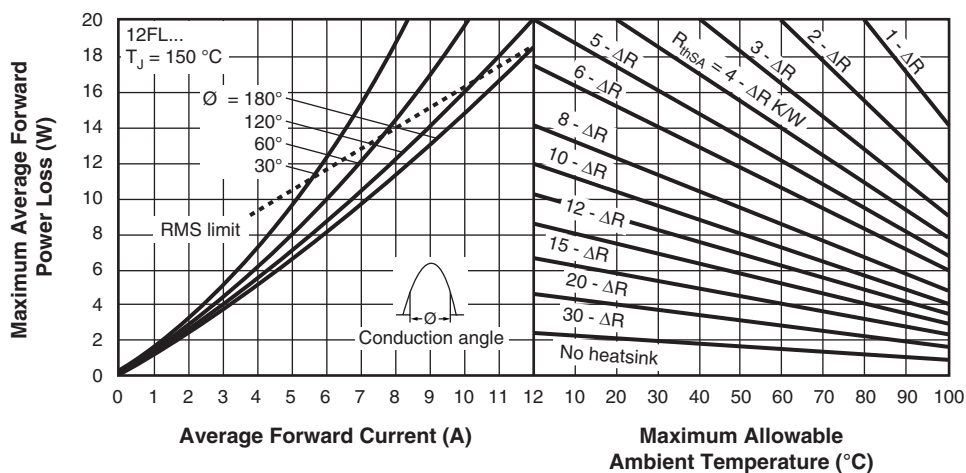
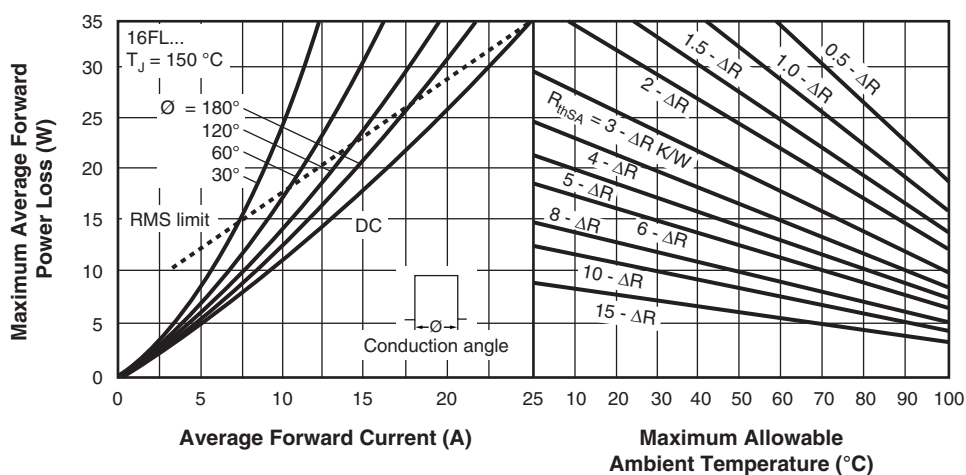
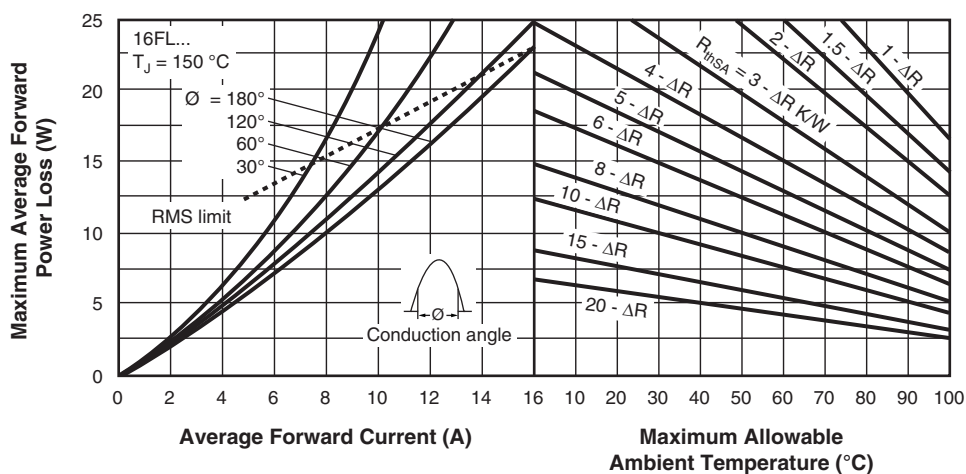
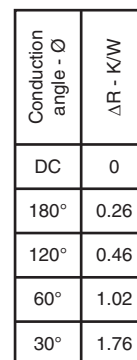


Fig. 7 - Current Rating Nomogram (Sinusoidal Waveforms), 12FL Series

Conduction angle - Φ	ΔR - KW
180°	0.46
120°	0.48
60°	1.02
30°	1.76



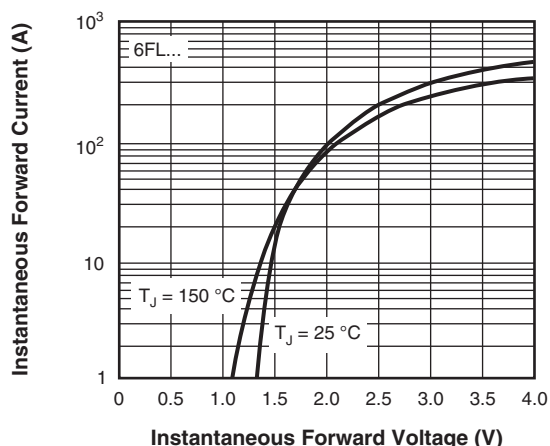


Fig. 11 - Maximum Forward Voltage vs. Forward Current, 6FL Series

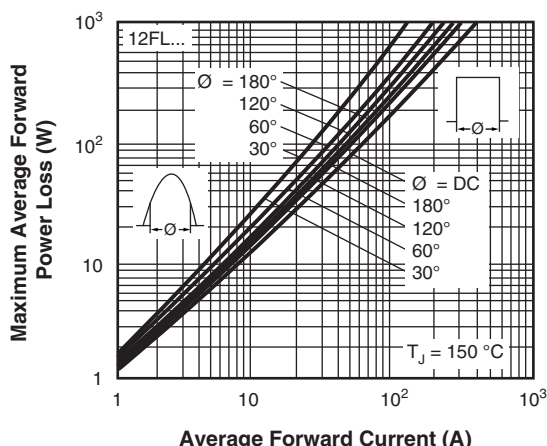


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 12FL Series

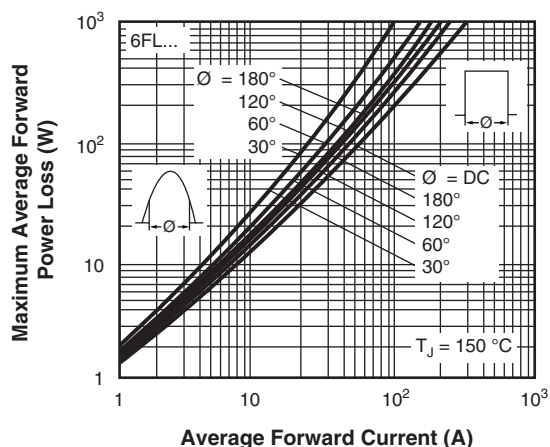


Fig. 12 - Maximum High Level Forward Power Loss vs. Average Forward Current, 6FL Series

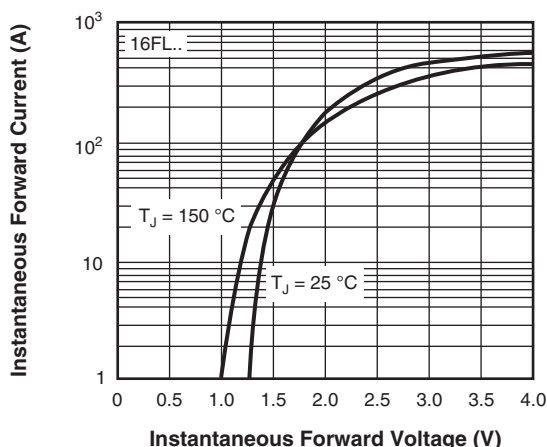


Fig. 15 - Maximum Forward Voltage vs. Forward Current, 16FL Series

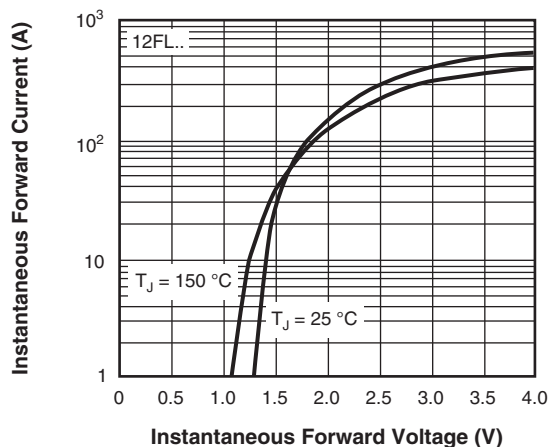


Fig. 13 - Maximum Forward Voltage vs. Forward Current, 12FL Series

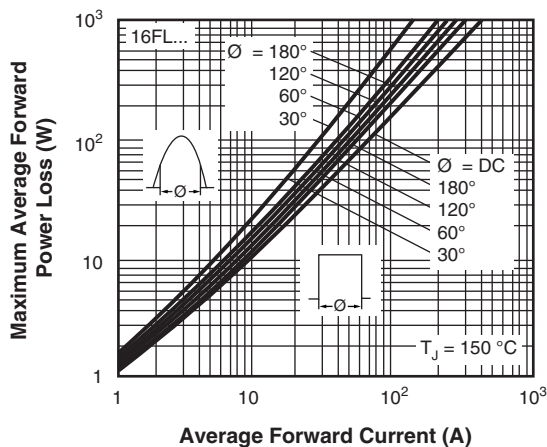


Fig. 16 - Maximum High Level Forward Power Loss vs. Average Forward Current, 16FL Series

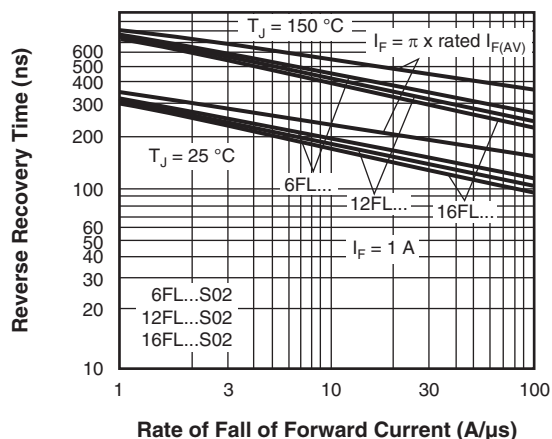


Fig. 17a - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, All Series ...S02

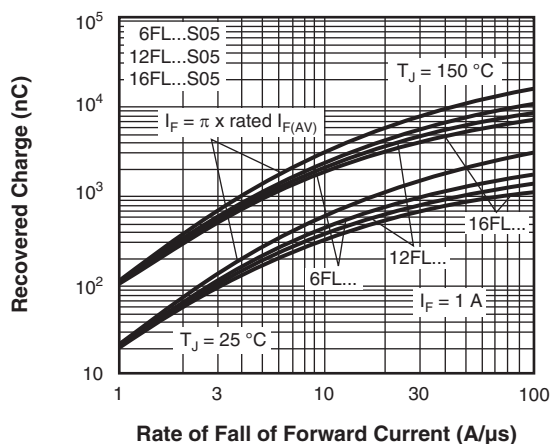


Fig. 18b - Typical Recovered Charge vs. Rate of Fall of Forward Current, All Series ...S05

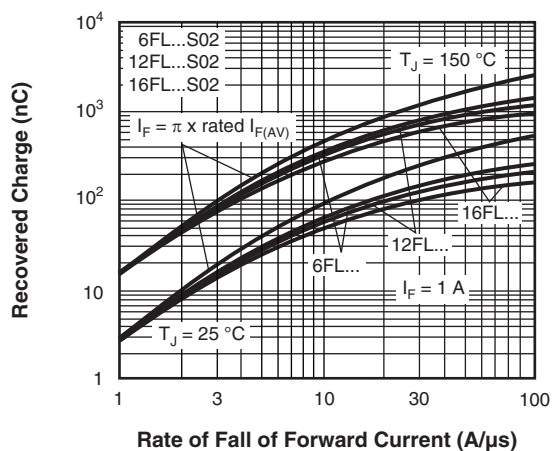


Fig. 17b - Typical Recovered Charge vs. Rate of Fall of Forward Current, All Series ...S02

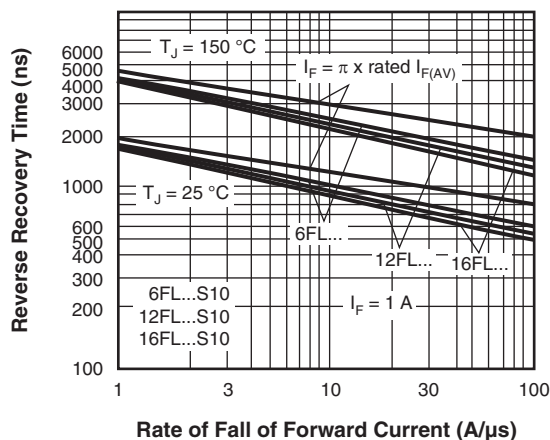


Fig. 19a - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, All Series ...S10

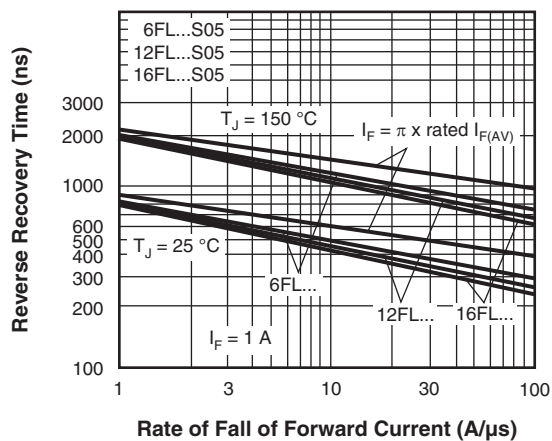


Fig. 18a - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, All Series ...S05

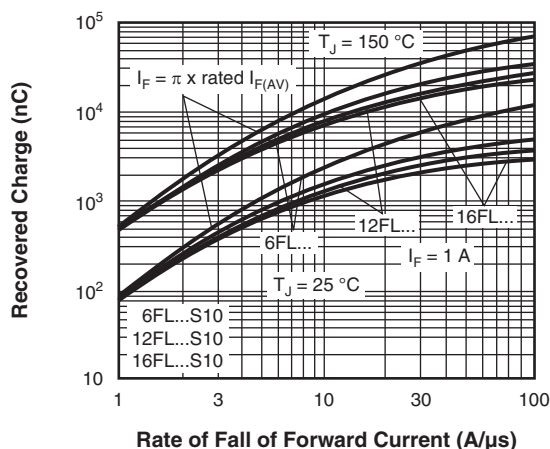


Fig. 19b - Typical Recovered Charge vs. Rate of Fall of Forward Current, All Series ...S10

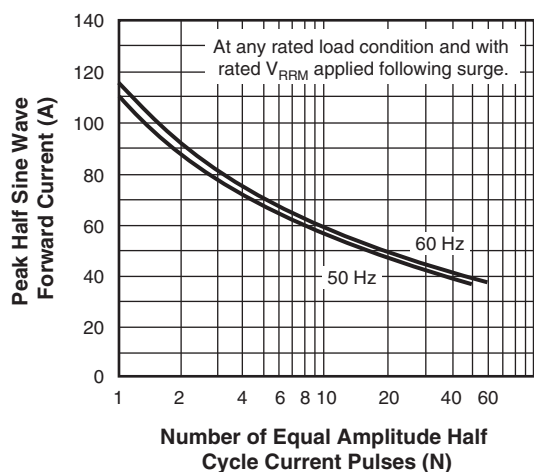


Fig. 20 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 6FL Series

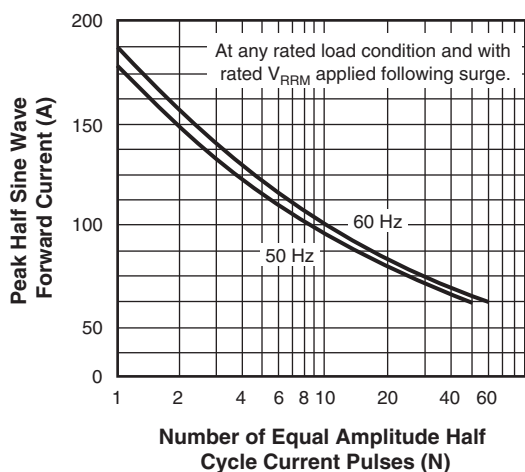


Fig. 22 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 16FL Series

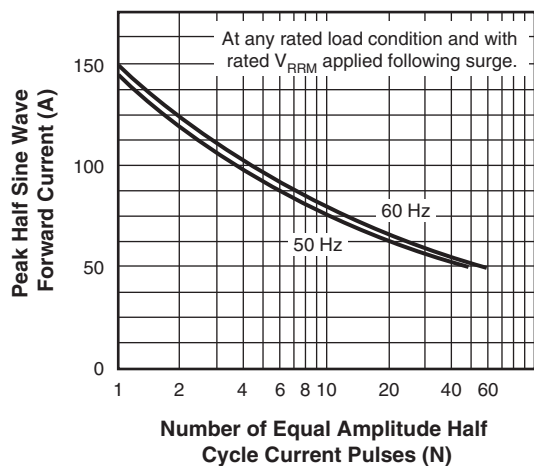


Fig. 21 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 12FL Series

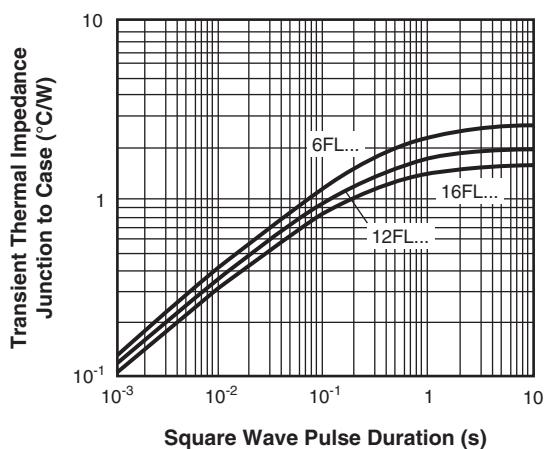


Fig. 23 - Maximum Transient Thermal Impedance, Junction to Case vs. Pulse Duration, All Series



ORDERING INFORMATION TABLE

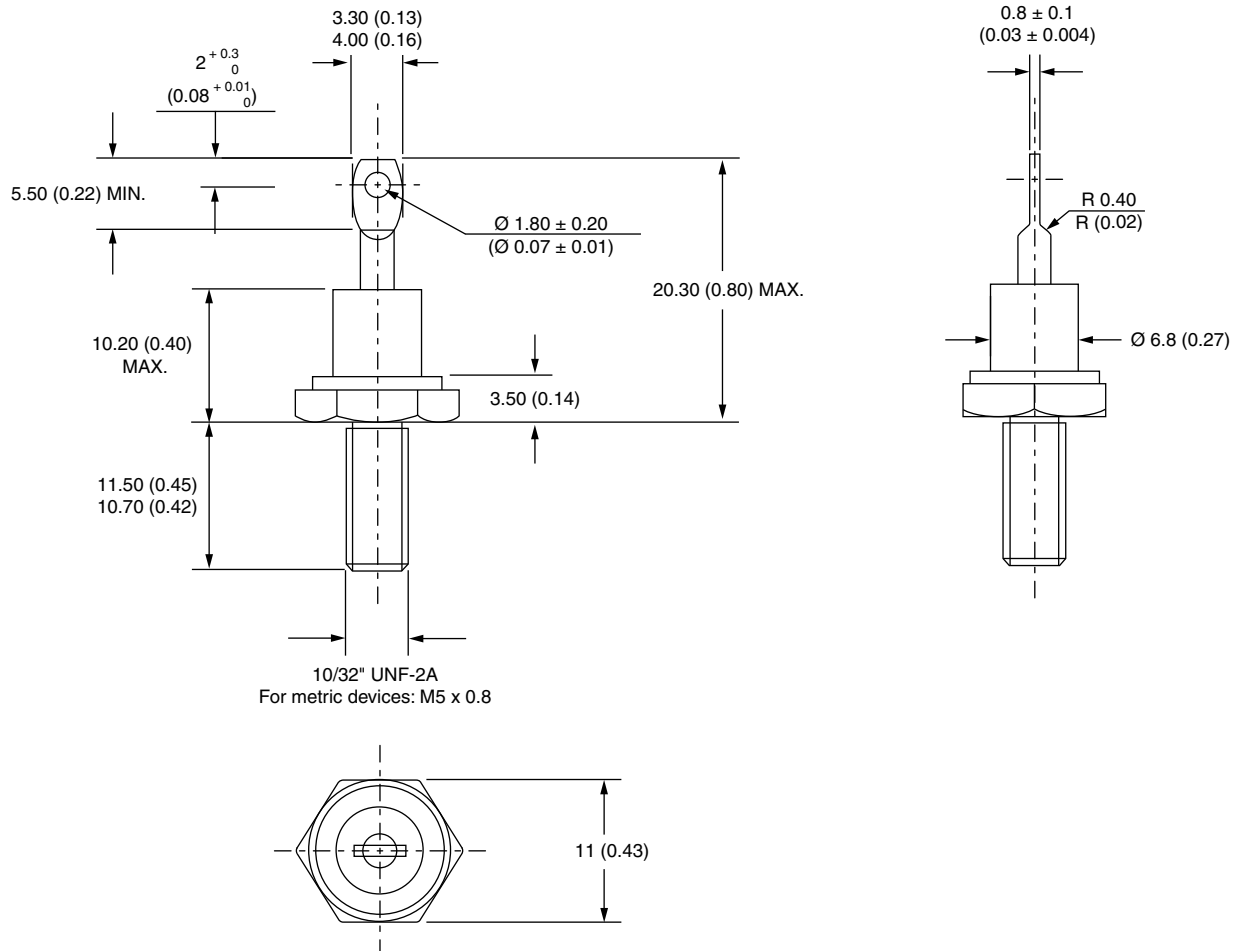
Device code	VS-	16	F	L	R	60	M	S02
	1	2	3	4	5	6	7	8

- | | | |
|----------|---|---|
| 1 | - | Vishay Semiconductors product |
| 2 | - | Current code $I_{(AVG)}$ = Exact current rating |
| 3 | - | F = Diode |
| 4 | - | Omit = Standard recovery diode
L = Only for fast diode |
| 5 | - | Omit = Stud forward polarity
R = Stud reverse polarity |
| 6 | - | Voltage code x 10 = V_{RRM} (see Voltage Ratings table) |
| 7 | - | Outlines:
Omit = Stud base UNF thread
M = Stud base metric thread |
| 8 | - | t_{rr} code only for fast diode (see Recovery Characteristics table) |

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95311

DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)





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- Техническая поддержка
- Подбор комплектации
- Индивидуальный подход
- Гибкое ценообразование

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Перечень производителей, продукцию которых мы поставляем на российский рынок





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Менеджер отдела продаж ООО

«Трейд Электроникс»

Шишлаков Евгений

8 (495)668-30-28 доб 169

manager28@tradeelectronics.ru

<http://www.tradeelectronics.ru/>