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
- Compliant to RoHS directive 2002/95/EC

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

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	6FL..	12FL..	16FL..	UNITS
$I_{F(AV)}$	T_C = 100 °C	6	12	16	A
$I_{F(RMS)}$		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	A^2s
	60 Hz	55	94	150	
$I^2\sqrt{t}$		1452	1452	2290	$I^2\sqrt{s}$
V_{RRM}	Range	50 to 1000			V
t_{rr}		See Recovery Characteristics table			ns
T_J	Range	- 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 °C µA	I_{RRM} MAXIMUM AT T_J = 100 °C mA	I_{RRM} MAXIMUM AT T_J = 150 °C mA
6FL.. 12FL.. 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

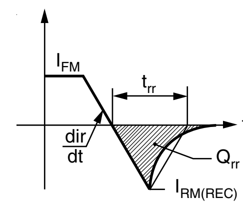
PARAMETER	SYMBOL	TEST CONDITIONS			6FL..	12FL..	16FL..	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			6	12 (1)	16	A
		DC			100	100	100	°C
Maximum RMS current	$I_{F(RMS)}$				9.5	19	25	A
Maximum peak, one-cycle non-repetitive forward current	I_{FSM}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

Note

(1) JEDEC registered values

RECOVERY CHARACTERISTICS

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



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

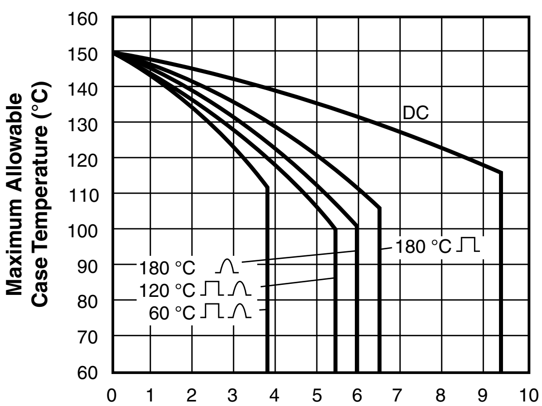


Fig. 1 - Average Forward Current vs. Maximum Allowable Case Temperature, 6FL Series

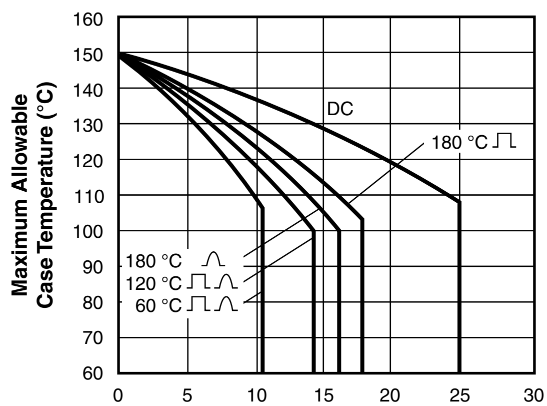


Fig. 3 - Average Forward Current vs. Maximum Allowable Case Temperature, 16FL Series

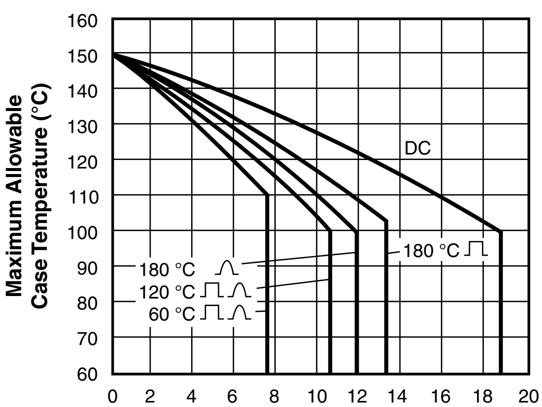
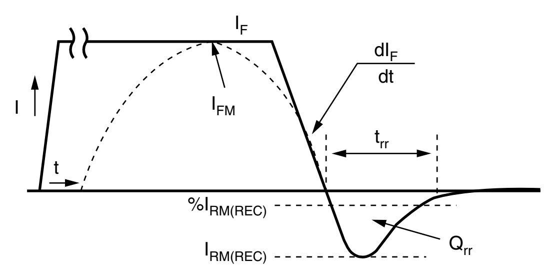
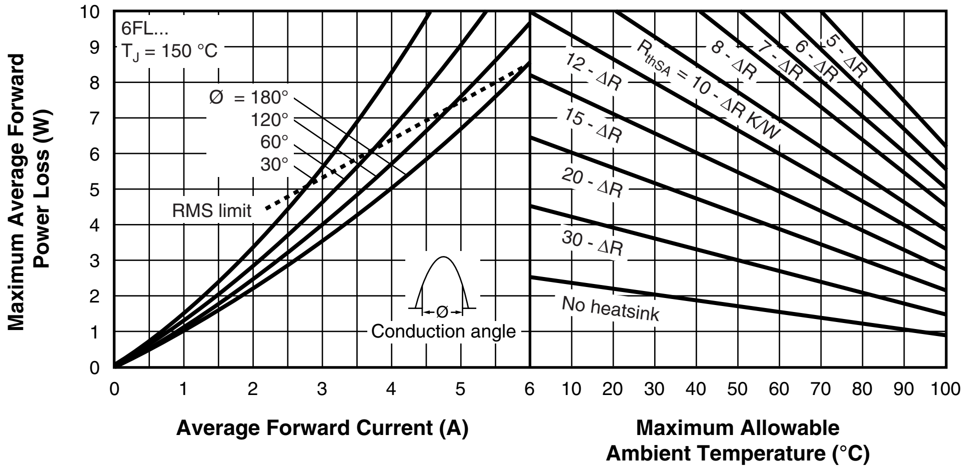


Fig. 2 - Average Forward Current vs. Maximum Allowable Case Temperature, 12FL Series



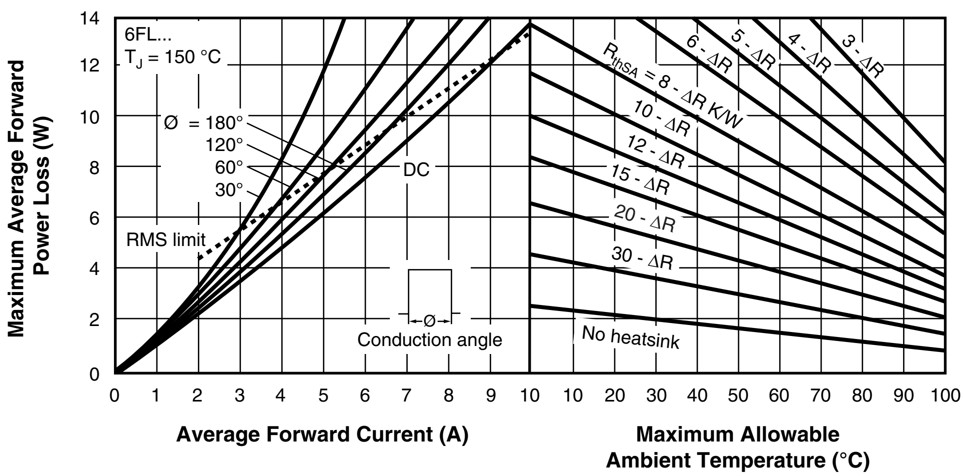
I_F, I_{FM} - Peak forward current prior to commutation
-dI_F/dt - Rate of fall of forward current
$I_{RM(REC)}$ - Peak reverse recovery current
t_{rr} - Reverse recovery time
Q_{rr} - Reverse recovered charge

Fig. 4 - Reverse Recovery Time Test Waveform



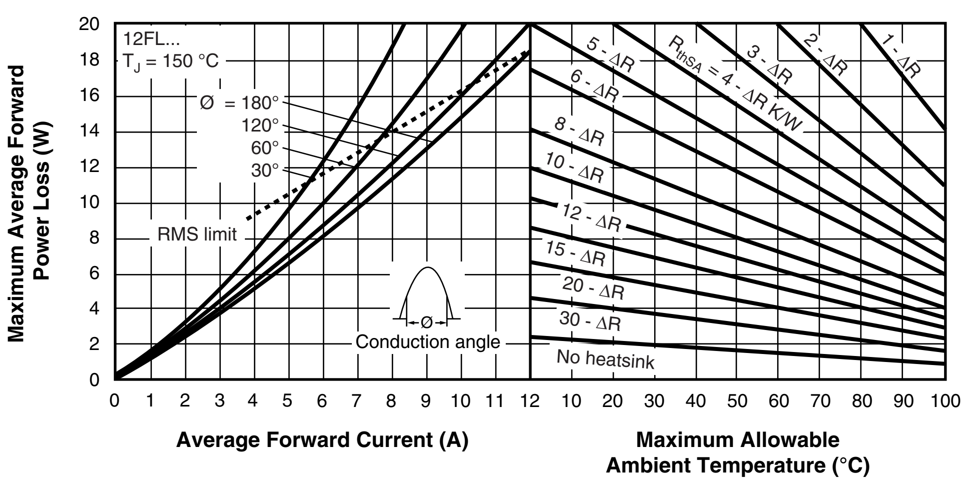
Conduction angle - Ø	ΔR - K/W
180°	0.58
120°	0.60
60°	1.28
30°	2.20

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



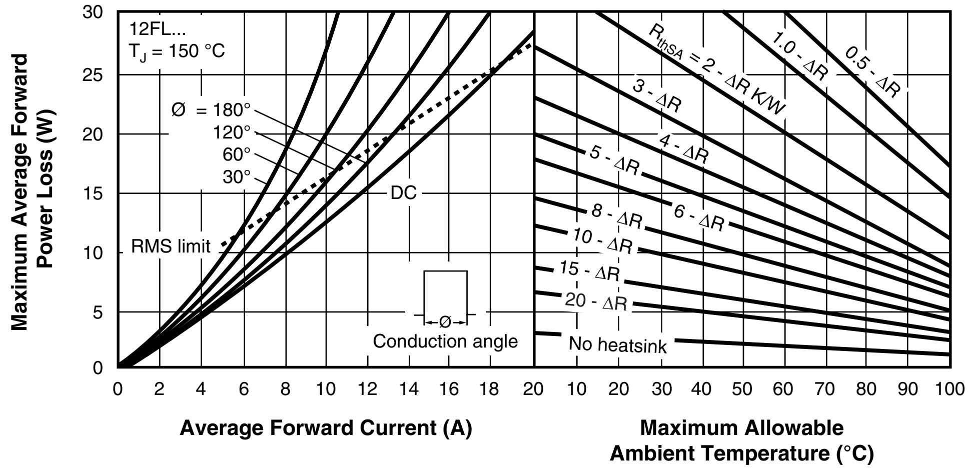
Conduction angle - Ø	ΔR - K/W
DC	0
180°	0.33
120°	0.58
60°	1.28
30°	2.20

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



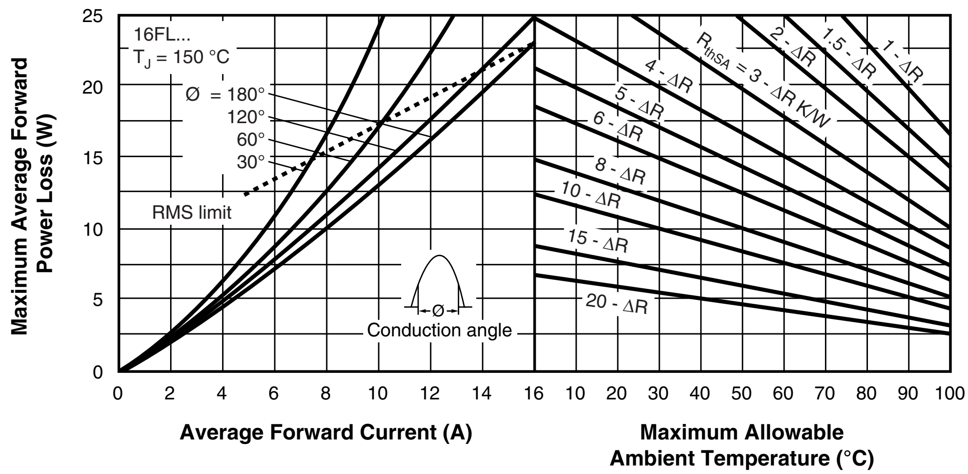
Conduction angle - Ø	ΔR - K/W
180°	0.46
120°	0.48
60°	1.02
30°	1.76

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



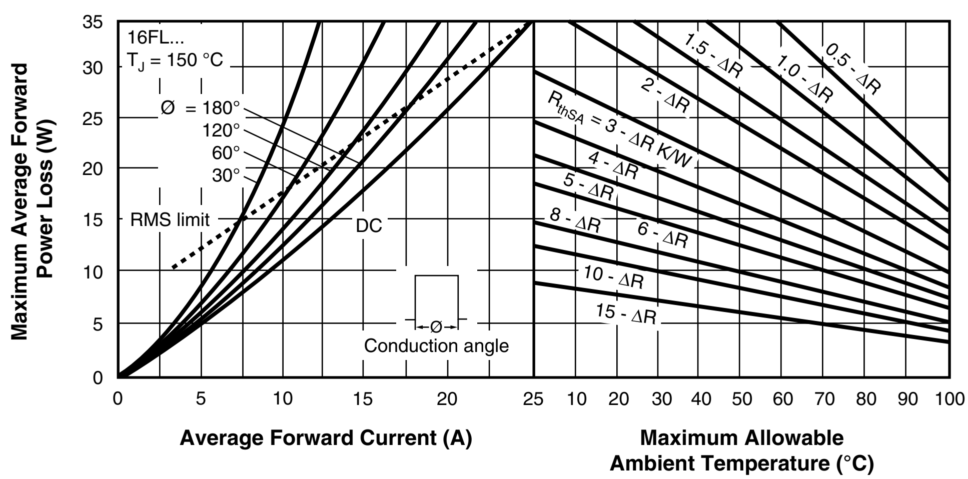
Conduction angle - Ø	ΔR - K/W
DC	0
180°	0.26
120°	0.46
60°	1.02
30°	1.76

Fig. 8 - Current Rating Nomogram (Rectangular Waveforms), 12FL Series



Conduction angle - Ø	ΔR - K/W
180°	0.37
120°	0.39
60°	0.82
30°	1.41

Fig. 9 - Current Rating Nomogram (Sinusoidal Waveforms), 16FL Series



Conduction angle - Ø	ΔR - K/W
DC	0
180°	0.21
120°	0.37
60°	0.82
30°	1.41

Fig. 10 - Current Rating Nomogram (Rectangular Waveforms), 16FL Series

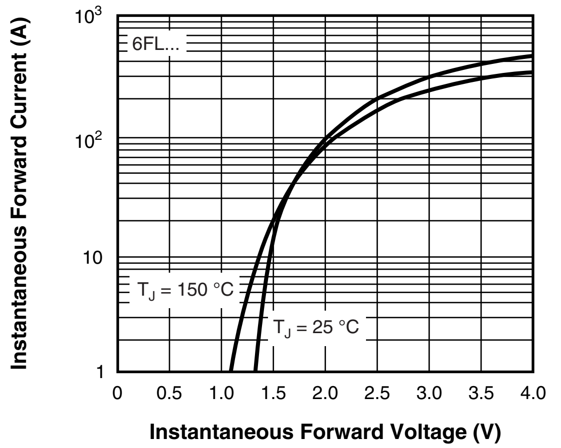


Fig. 11 - Maximum Forward Voltage vs. Forward Current, 6FL Series

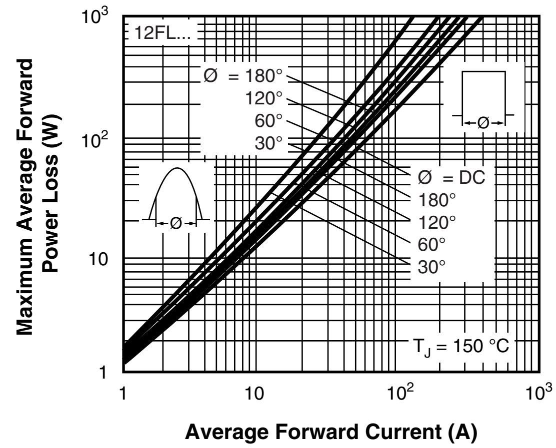


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 12FL Series

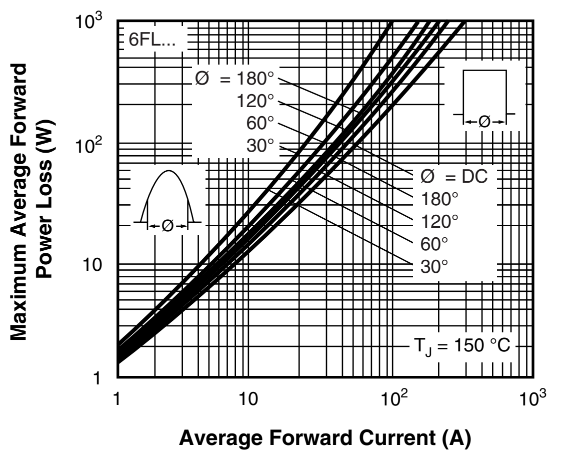


Fig. 12 - Maximum High Level Forward Power Loss vs. Average Forward Current, 6FL Series

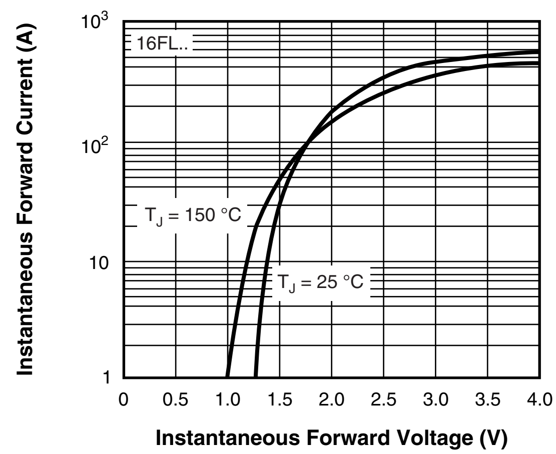


Fig. 15 - Maximum Forward Voltage vs. Forward Current, 16FL Series

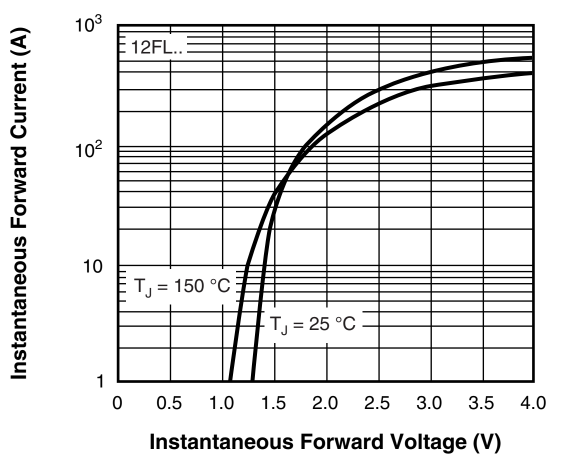


Fig. 13 - Maximum Forward Voltage vs. Forward Current, 12FL Series

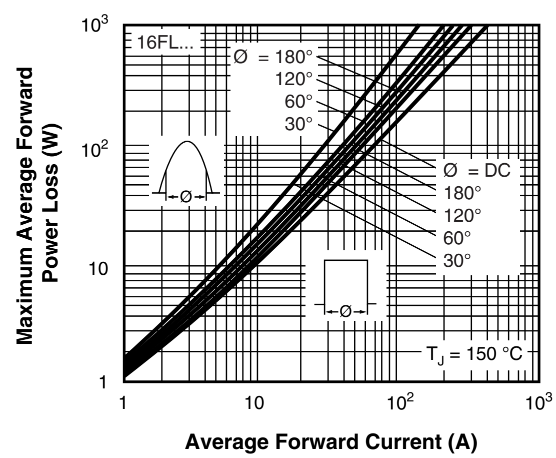


Fig. 16 - Maximum High Level Forward Power Loss vs. Average Forward Current, 16FL Series

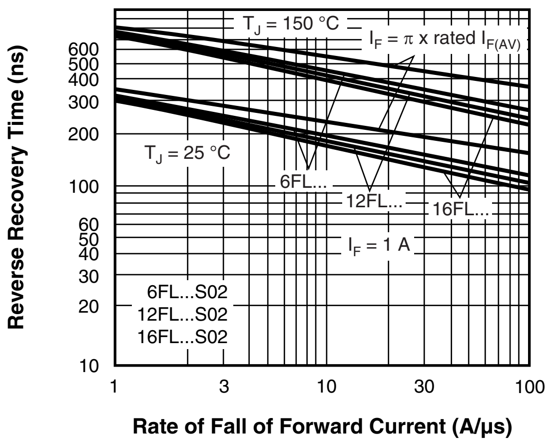


Fig. 17a - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, All Series ...S02

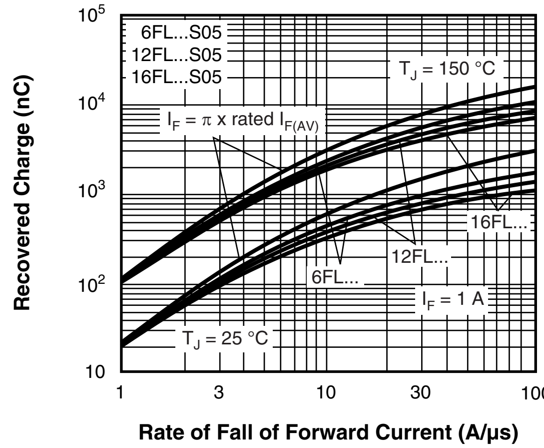


Fig. 18b - Typical Recovered Charge vs.
Rate of Fall of Forward Current, All Series ...S05

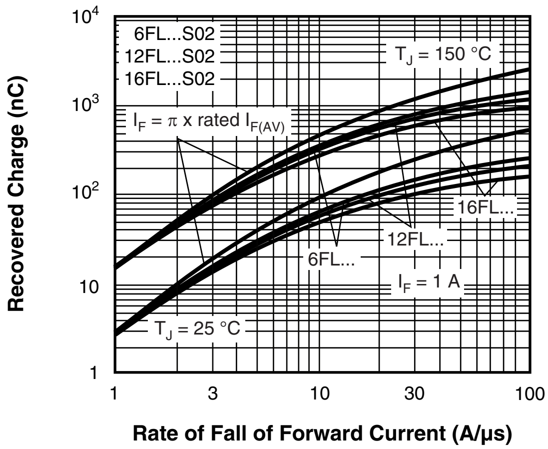


Fig. 17b - Typical Recovered Charge vs.
Rate of Fall of Forward Current, All Series ...S02

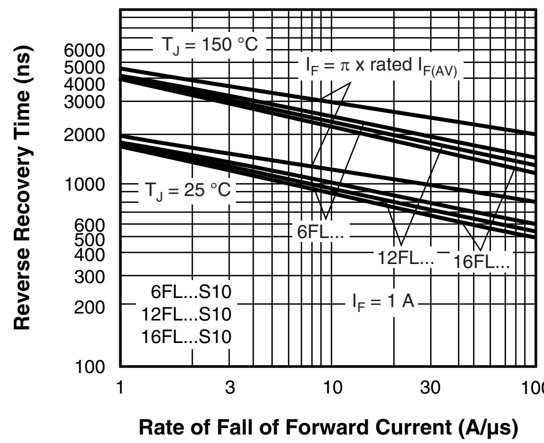


Fig. 19a - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, All Series ...S10

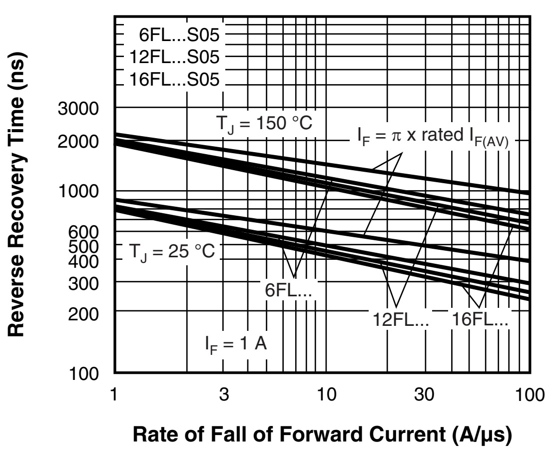


Fig. 18a - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, All Series ...S05

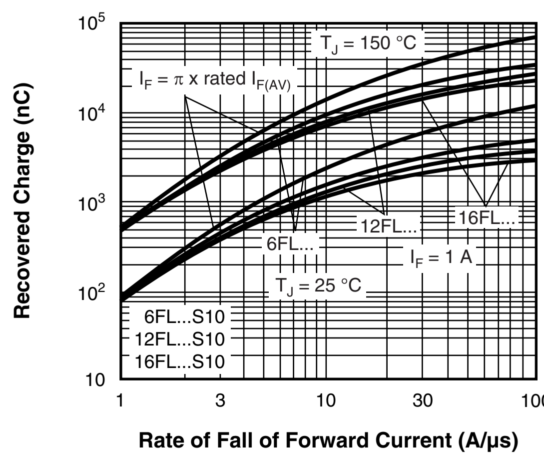


Fig. 19b - Typical Recovered Charge vs.
Rate of Fall of Forward Current, All Series ...S10

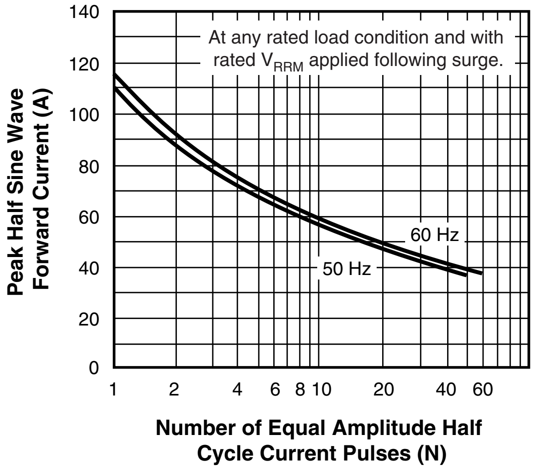


Fig. 20 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 6FL Series

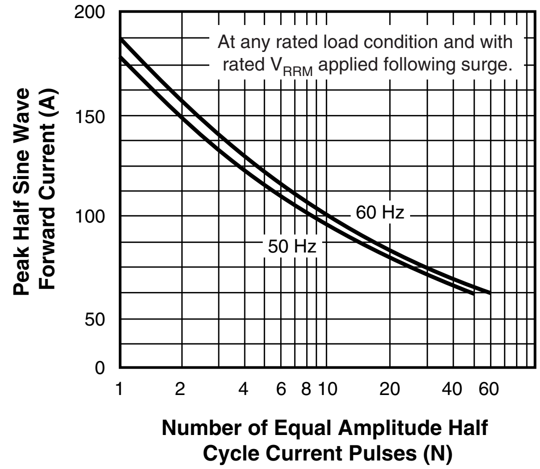


Fig. 22 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 16FL Series

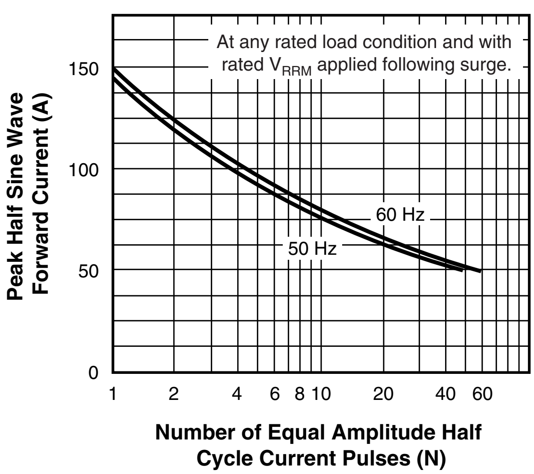


Fig. 21 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 12FL Series

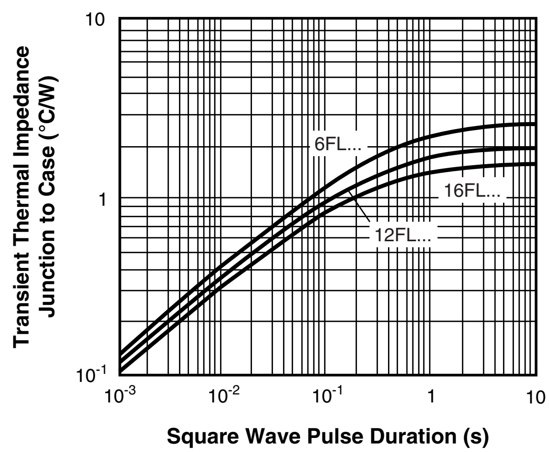


Fig. 23 - Maximum Transient Thermal Impedance, Junction to Case vs. Pulse Duration, All Series

ORDERING INFORMATION TABLE

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

1 - Current code $I_{(AVG)}$ = Exact current rating

2 - F = Diode

3 - Omit = Standard recovery diode
L = Only for fast diode

4 - Omit = Stud forward polarity
R = Stud reverse polarity

5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

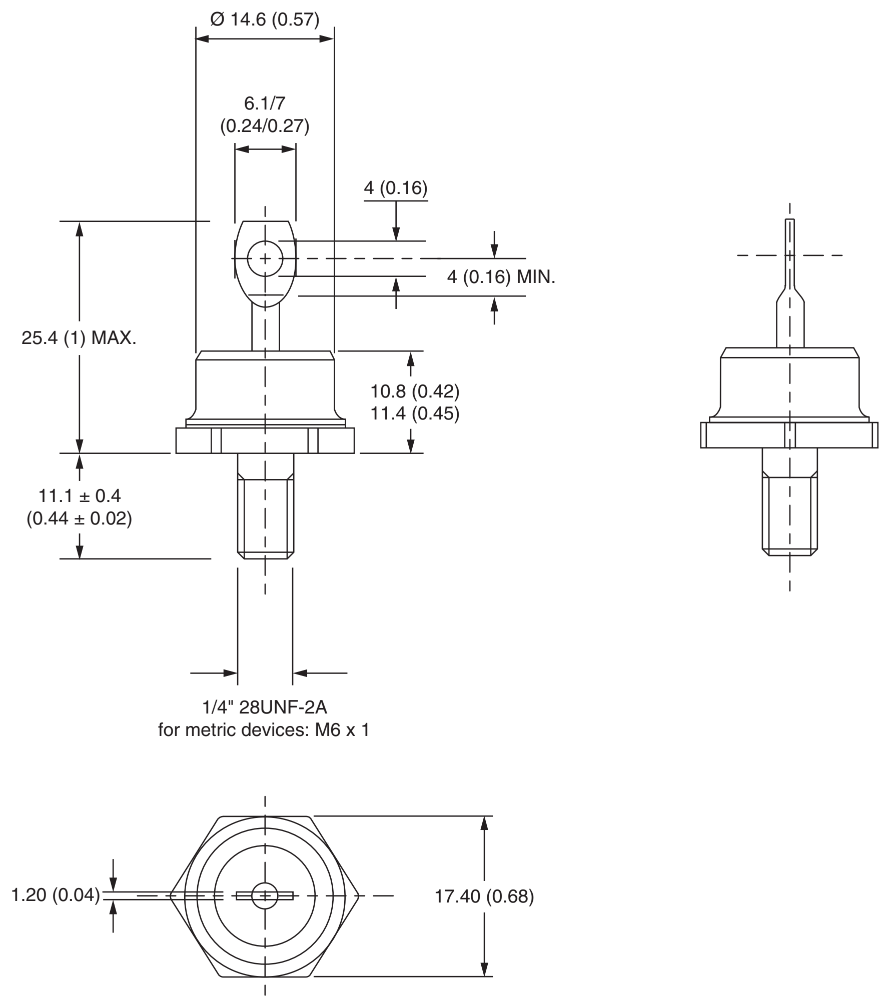
6 - Outlines:
Omit = Stud base UNF thread
M = Stud base metric thread

7 - t_{rr} code only for fast diode (see Recovery Characteristics table)

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

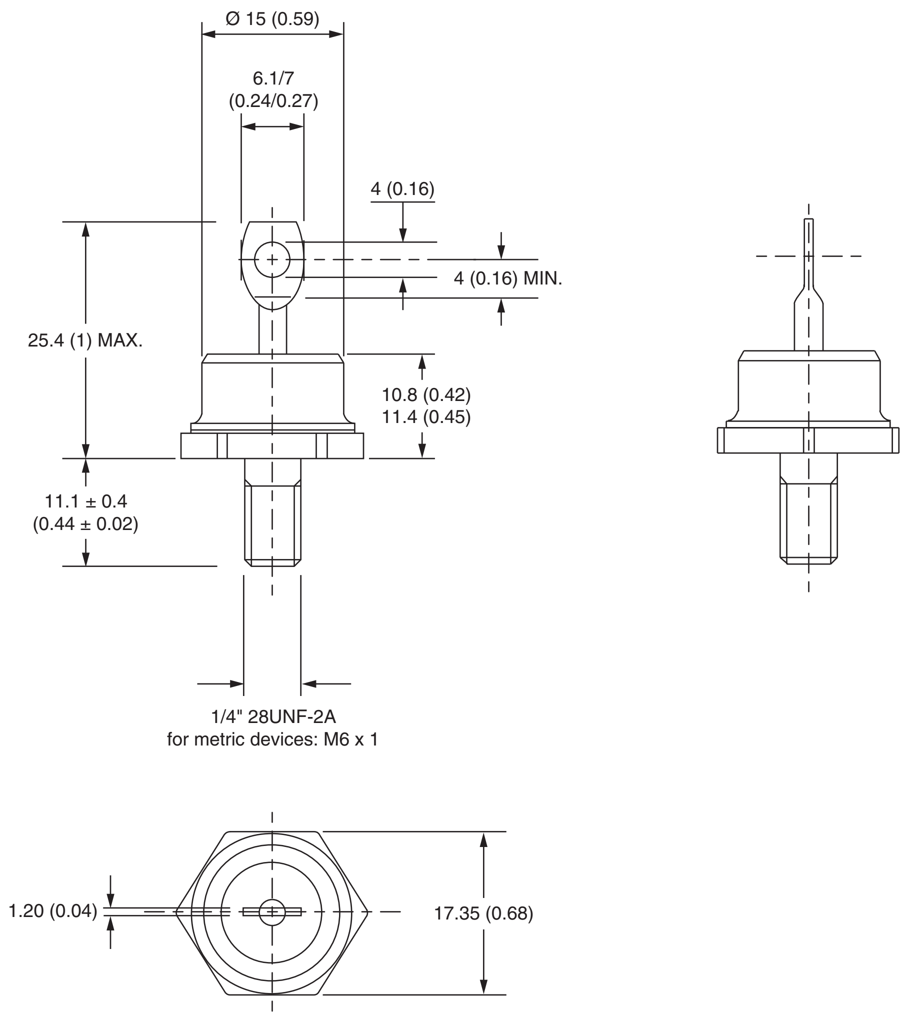
DO-203AB (DO-5) for 40HFL, 70HFL and 85HFL

DIMENSIONS FOR 40HFL/70HFL in millimeters (inches)



DO-203AB (DO-5) for
40HFL, 70HFL and 85HFL

DIMENSIONS FOR 85HFL in millimeters (inches)



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LifeElectronics
Живое партнерство

ООО "ЛайфЭлектроникс" **"LifeElectronics" LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

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- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
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- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

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- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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Email: org@lifeelectronics.ru

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