Fast Recovery Diodes (Stud Version), 40 A, 70 A, 85 A

DO-203AB (DO-5)

FEATURES

- Short reverse recovery time
- Low stored charge
- Wide current range
- Excellent surge capabilities
- Stud cathode and stud anode versions
- Types up to 100 V_{RRM}
- 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	
$I_{F(AV)}$	40 A, 70 A, 85 A
Package	DO-203AB (DO-5)
Circuit configuration	Single diode

MAJOR RATINGS AND CHARACTERISTICS					
PARAMETER	TEST CONDITIONS	40HFL	70HFL	85HFL	UNITS
$I_{F(AV)}$		40	70	85	A
	T_C maximum	85	85	85	°C
I_{FSM}	50 Hz	400	700	1100	A
	60 Hz	420	730	1151	
I^2t	50 Hz	800	2450	6050	A^2s
	60 Hz	730	2240	5523	
$I^2\sqrt{t}$		11 300	34 650	85 560	$I^2\sqrt{s}$
V_{RRM}	Range	100 to 1000	100 to 1000	100 to 1000	V
t_{rr}		See Recovery Characteristics table	See Recovery Characteristics table	See Recovery Characteristics table	ns
T_J	Range	-40 to 125	-40 to 125	-40 to 125	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER (1)	V_{RRM}, MAXIMUM PEAK REPETITIVE REVERSE VOLTAGE T_J = - 40 °C TO 125 °C V	V_{RSM}, MAXIMUM PEAK NON-REPETITIVE REVERSE VOLTAGE T_J = 25 °C TO 125 °C V	I_{FM}, MAXIMUM PEAK REVERSE CURRENT AT RATED V_{RRM} mA	
			T_J = 25 °C	T_J = 125 °C
VS-40HFL10S02, VS-40HFL10S05	100	150	0.1	10
VS-40HFL20S02, VS-40HFL20S05	200	300		
VS-40HFL40S02, VS-40HFL40S05	400	500		
VS-40HFL60S02, VS-40HFL60S05	600	700		
VS-40HFL80S05	800	900		
VS-40HFL100S05	1000	1100		
VS-70HFL10S02, VS-70HFL10S05	100	150	0.1	15
VS-70HFL20S02, VS-70HFL20S05	200	300		
VS-70HFL40S02, VS-70HFL40S05	400	500		
VS-70HFL60S02, VS-70HFL60S05	600	700		
VS-70HFL80S05	800	900		
VS-70HFL100S05	1000	1100		
VS-85HFL10S02, VS-85HFL10S05	100	150	0.1	20
VS-85HFL20S02, VS-85HFL20S05	200	300		
VS-85HFL40S02, VS-85HFL40S05	400	500		
VS-85HFL60S02, VS-85HFL60S05	600	700		
VS-85HFL80S05	800	900		
VS-85HFL100S05	1000	1100		

Note

(1) Types listed are cathode case, for anode case add "R" to code, i.e. 40HFLR20S02, 85HFLR100S05 etc.

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS		40HFL	70HFL	85HFL	UNITS
Maximum average forward current at maximum case temperature	$I_{F(AV)}$	180° conduction, half sine wave		40	70	85	A
				75			°C
Maximum RMS forward current	$I_{F(RMS)}$			63	110	134	A
Maximum peak repetitive forward current	I_{FRM}	Sinusoidal half wave, 30° conduction		220	380	470	A
Maximum peak, one-cycle non-repetitive forward current	I_{FSM}	t = 10 ms	Sinusoidal half wave, 100 % V_{RRM} reapplied, initial T_J = T_J maximum	400	700	1100	A
		t = 8.3 ms		420	730	1151	
		t = 10 ms	Sinusoidal half wave, no voltage reapplied, initial T_J = T_J maximum	475	830	1308	
		t = 8.3 ms		500	870	1369	
Maximum I^2t for fusing	I^2t	t = 10 ms	100 % V_{RRM} reapplied, initial T_J = T_J maximum	800	2450	6050	A^2s
		t = 8.3 ms		730	2240	5523	
		t = 10 ms	No voltage reapplied, initial T_J = T_J maximum	1130	3460	8556	
		t = 8.3 ms		1030	3160	7810	
Maximum $I^2\sqrt{t}$ for fusing (1)	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied		11 300	34 650	85 560	$A^2\sqrt{s}$
Maximum value of threshold voltage	$V_{F(TO)}$	T_J = 125 °C		1.081	1.085	1.128	V
Maximum value of forward slope resistance	r_F			6.33	3.40	2.11	mΩ
Maximum forward voltage drop	V_{FM}	T_J = 25 °C, $I_{FM} = \pi \times I_{F(AV)}$		1.95	1.85	1.75	V

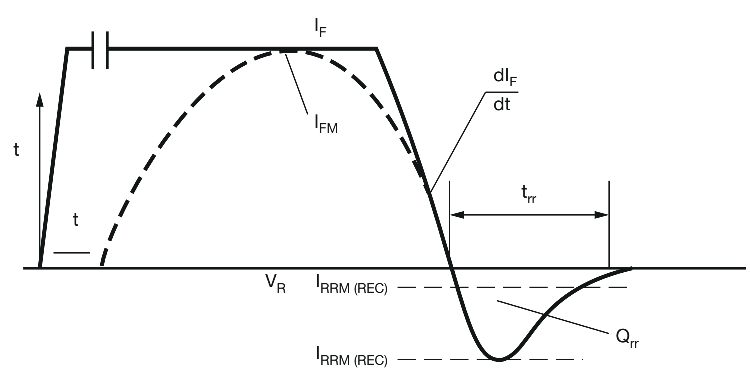
Note

(1) I^2t for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}$

RECOVERY CHARACTERISTICS									
PARAMETER	SYMBOL	TEST CONDITIONS	40HFL...		70HFL...		85HFL...		UNITS
			S02	S05	S02	S05	S02	S05	
Typical reverse recovery time	t_{rr}	T_J = 25 °C, I_F = 1 A to V_R = 30 V, dI_F/dt = 100 A/µs	70	180	60	150	50	120	ns
		T_J = 25 °C, - dI_F/dt = 25 A/µs, $I_{FM} = \pi$ x rated $I_{F(AV)}$	200	500	200	500	200	500	
Typical reverse recovered charge	Q_{rr}	T_J = 25 °C, I_F = 1 A to V_R = 30 V, dI_F/dt = 100 A/µs	160	750	90	500	70	340	nC
		T_J = 25 °C, - dI_F/dt = 25 A/µs, $I_{FM} = \pi$ x rated $I_{F(AV)}$	240	1300	240	1300	240	1300	

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	40HFL	70HFL	85HFL	UNITS
Junction operating temperature range	T_J		- 40 to 125			°C
Storage temperature range	T_{Stg}		- 40 to 150			
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.60	0.36	0.30	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.25			
Maximum allowable mounting torque (+ 0 %, - 10 %)		Not lubricated thread, tighting on nut [1]	3.4 (30)			N · m (lbf · in)
		Lubricated thread, tighting on nut [1]	2.3 (20)			
		Not lubricated thread, tighting on hexagon [2]	4.2 (37)			
		Lubricated thread, tighting on hexagon [2]	3.2 (28)			
Approximate weight			25			
			0.88			
Case style		JEDEC	DO-203AB (DO-5)			

Notes
[1] Recommended for pass-through holes
[2] Recommended for holed threaded heatsinks



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

Fig. 1 - Reverse Recovery Time Test Waveform

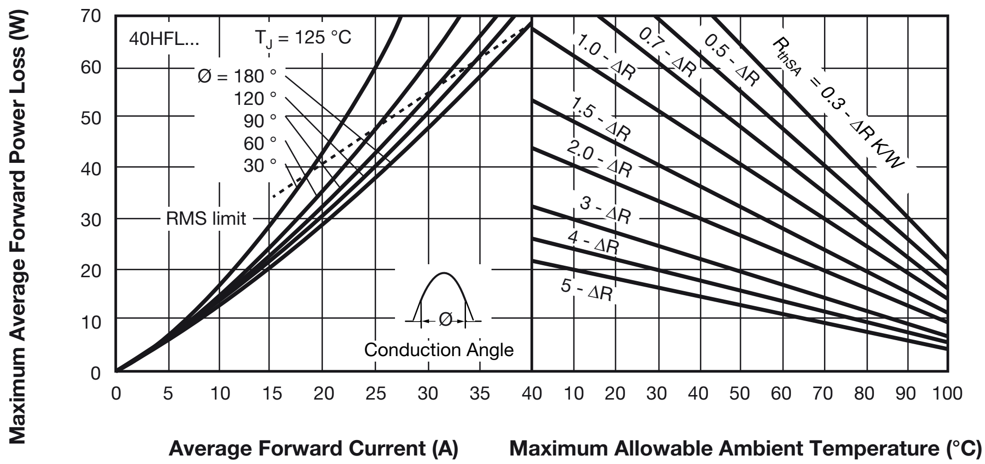


Fig. 2 - Current Rating Nomogram (Sinusoidal Waveforms), 40HFL Series

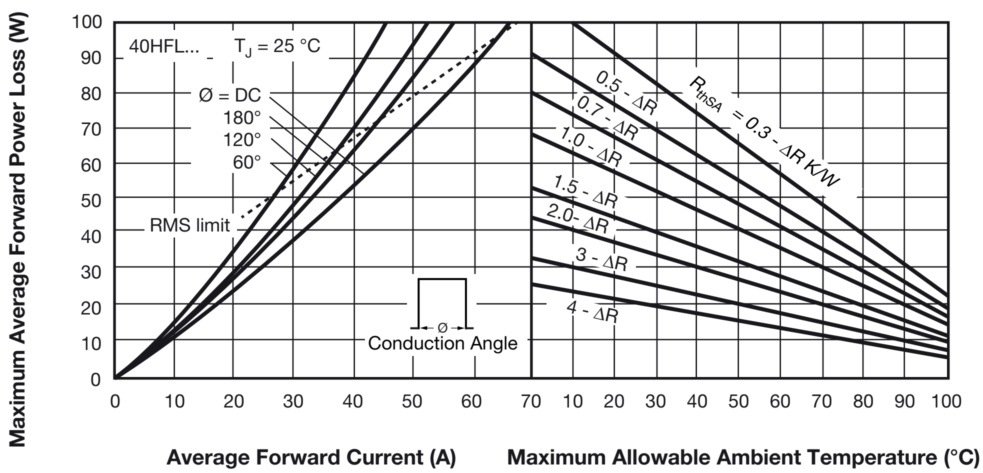


Fig. 3 - Current Rating Nomogram (Rectangular Waveforms), 40HFL Series

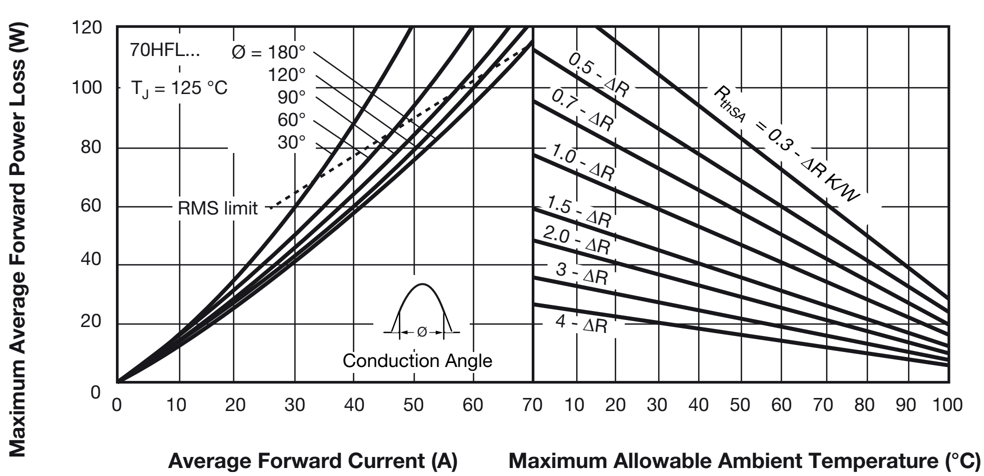


Fig. 4 - Current Rating Nomogram (Sinusoidal Waveforms), 70HFL Series

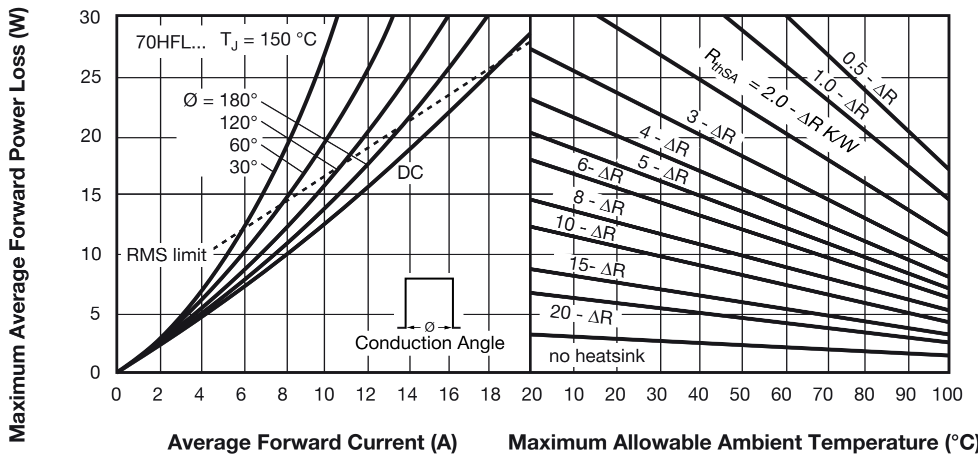


Fig. 5 - Current Rating Nomogram (Rectangular Waveforms), 70HFL Series

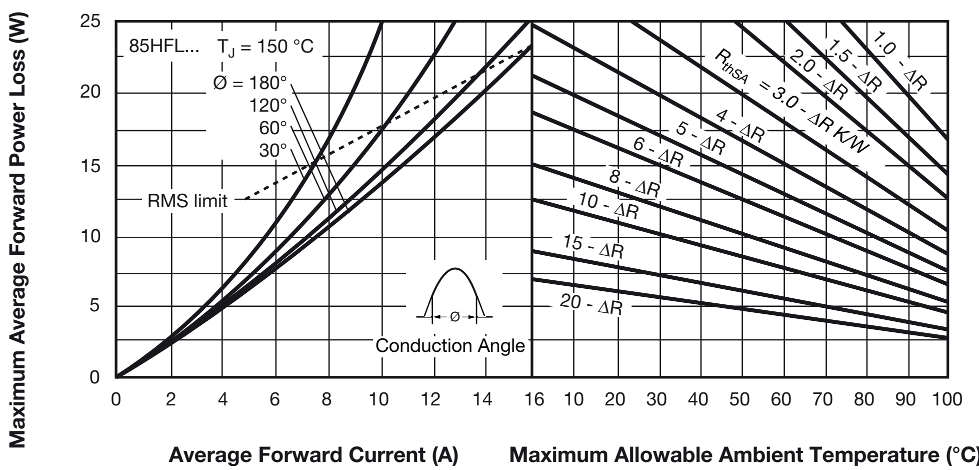


Fig. 6 - Current Rating Nomogram (Sinusoidal Waveforms), 85HFL Series

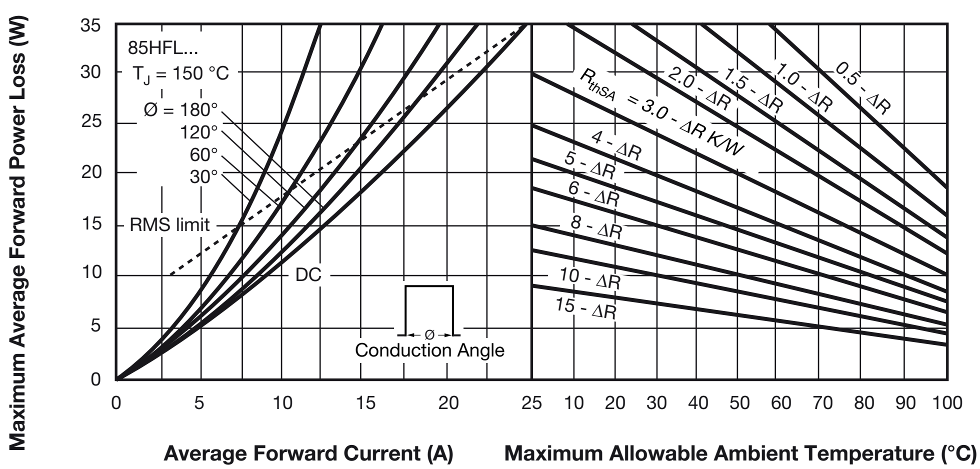


Fig. 7 - Current Rating Nomogram (Rectangular Waveforms), 85HFL Series

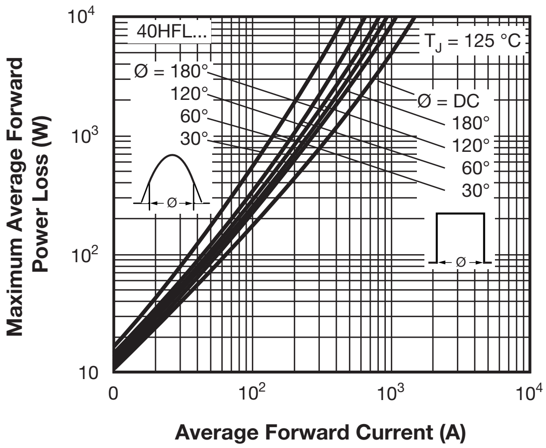


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 40HFL Series

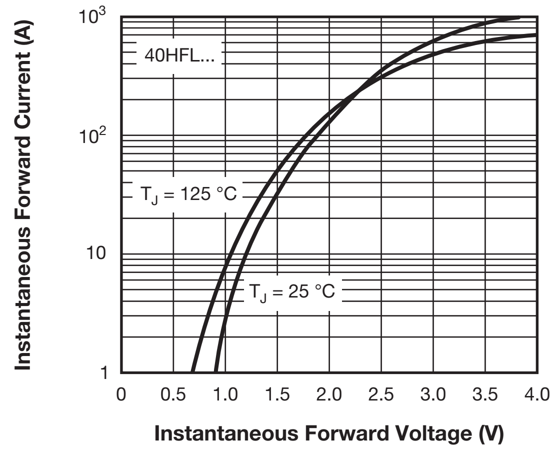


Fig. 11 - Maximum Forward Voltage vs. Forward Current, 40HFL Series

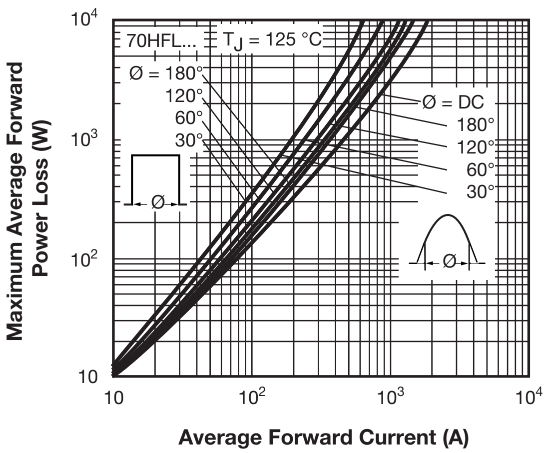


Fig. 9 - Maximum High Level Forward Power Loss vs. Average Forward Current, 70HFL Series

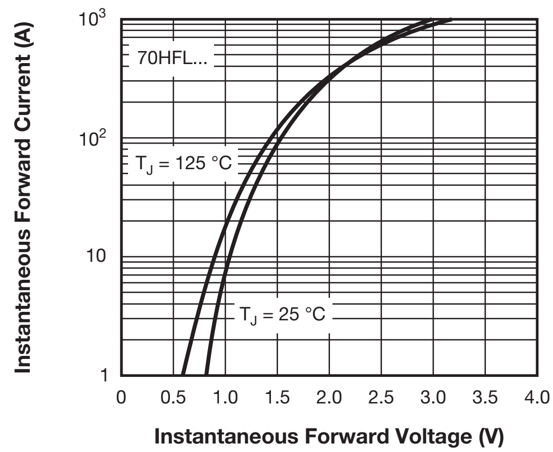


Fig. 12 - Maximum Forward Voltage vs. Forward Current, 70HFL Series

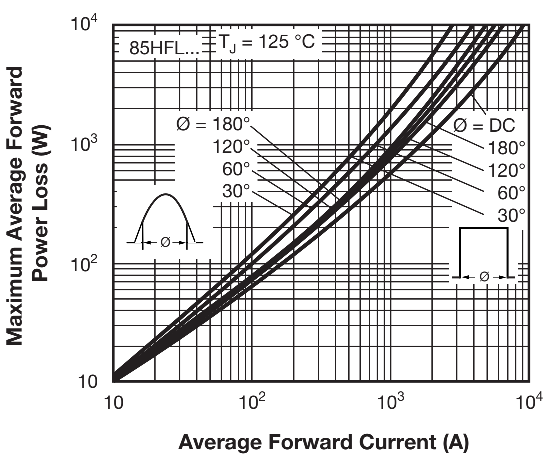


Fig. 10 - Maximum High Level Forward Power Loss vs. Average Forward Current, 85HFL Series

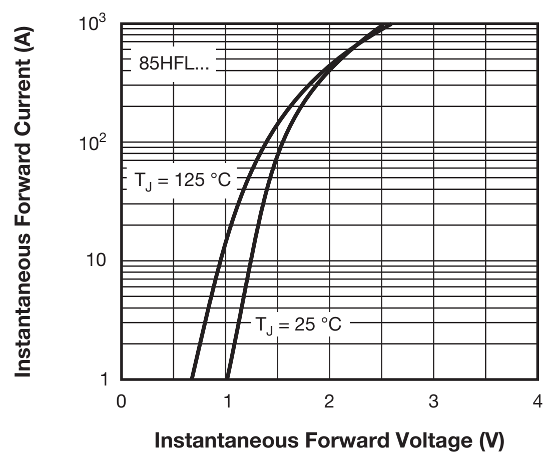


Fig. 13 - Maximum Forward Voltage vs. Forward Current, 85HFL Series

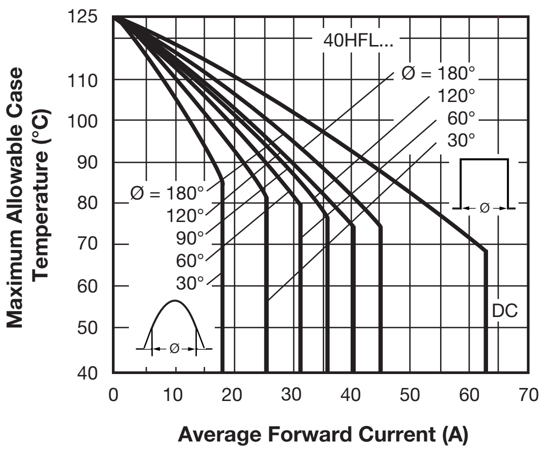


Fig. 14 - Average Forward Current vs. Maximum Allowable Case Temperature, 40HFL Series

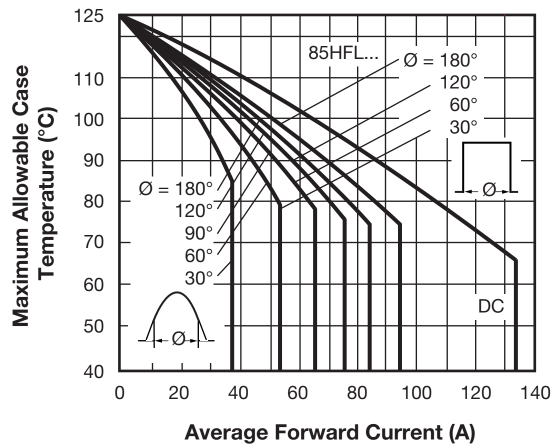


Fig. 16 - Average Forward Current vs. Maximum Allowable Case Temperature, 85HFL Series

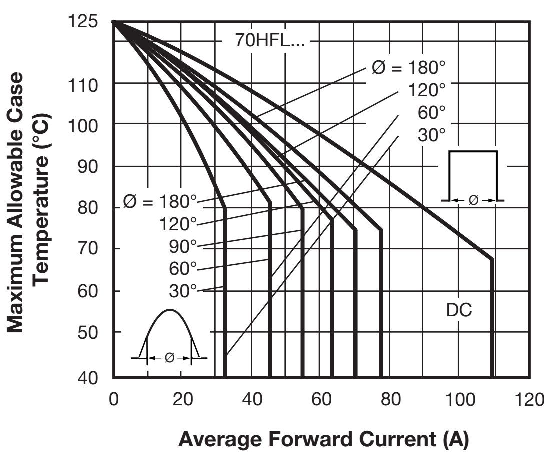


Fig. 15 - Average Forward Current vs. Maximum Allowable Case Temperature, 70HFL Series

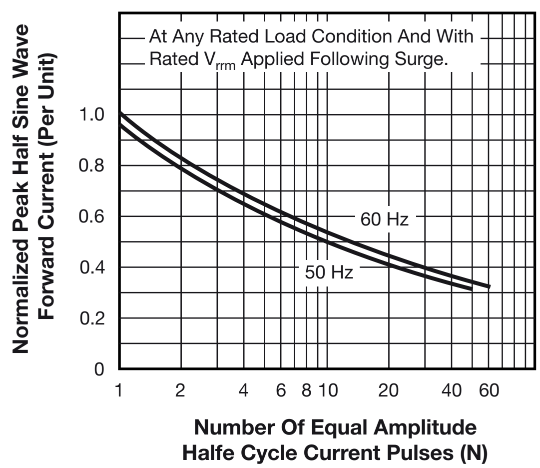


Fig. 17 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, All Series

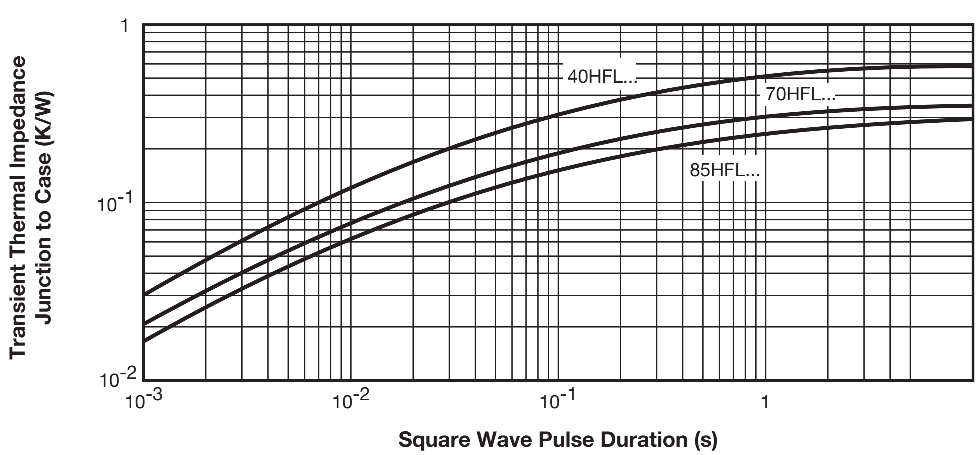


Fig. 18 - Maximum Transient Thermal Impedance, Junction to Case vs. Pulse Duration, All Series

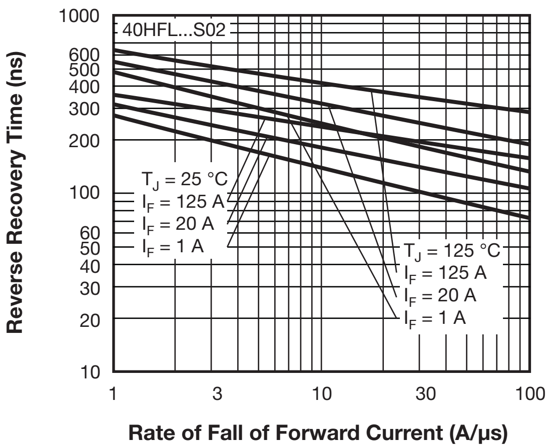


Fig. 19 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 40HFL...S02 Series

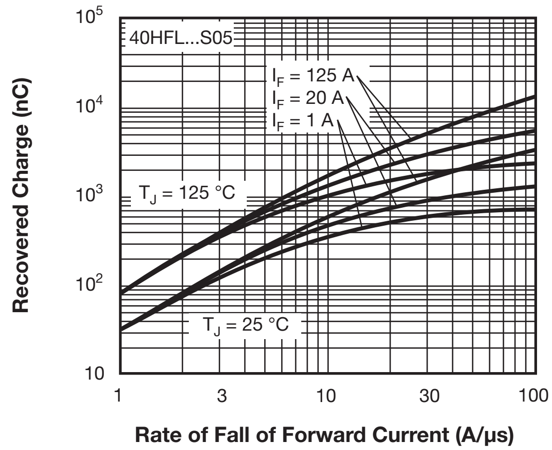


Fig. 22 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 40HFL...S05 Series

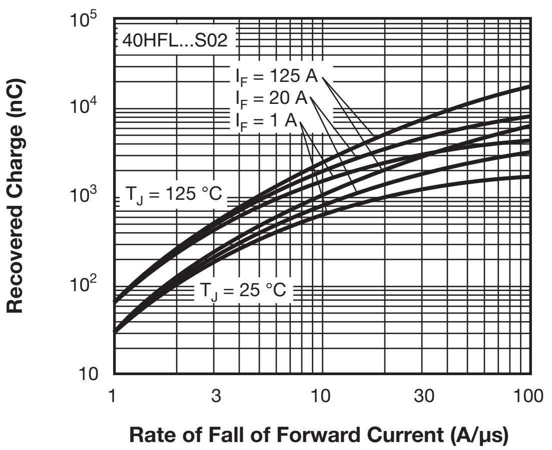


Fig. 20 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 40HFL...S02 Series

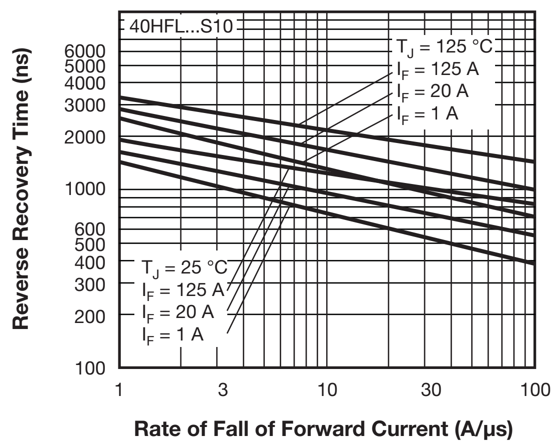


Fig. 23 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 40HFL...Series

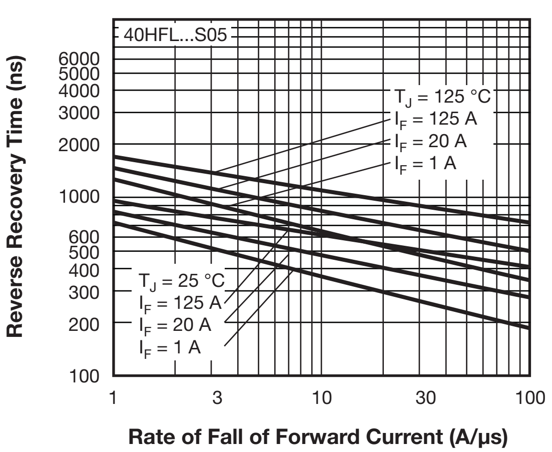


Fig. 21 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 40HFL...S05 Series

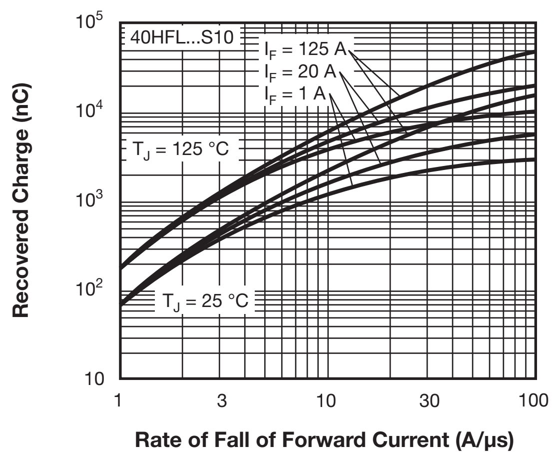


Fig. 24 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 40HFL...Series

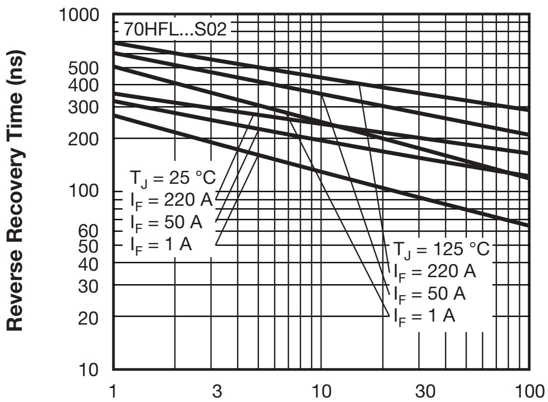


Fig. 25 - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, 70HFL...S02 Series

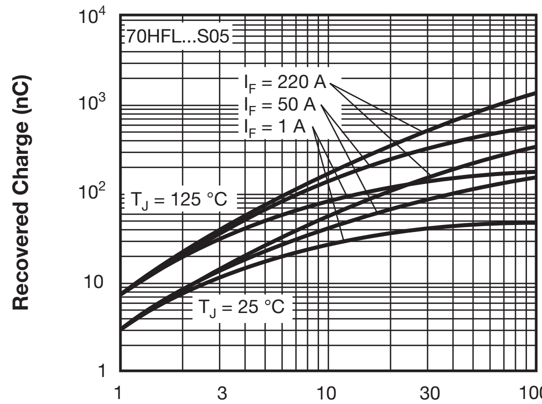


Fig. 28 - Typical Recovered Charge vs. Rate of Fall of Forward Current, 70HFL...S05 Series

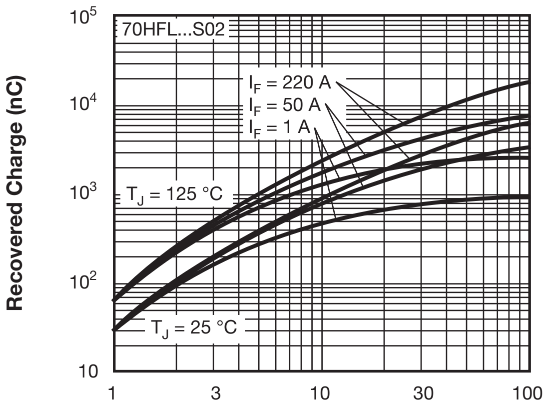


Fig. 26 - Typical Recovered Charge vs. Rate of Fall of Forward Current, 70HFL...S02 Series

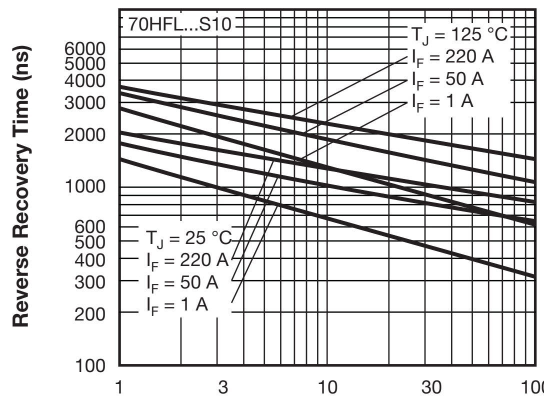


Fig. 29 - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, 70HFL... Series

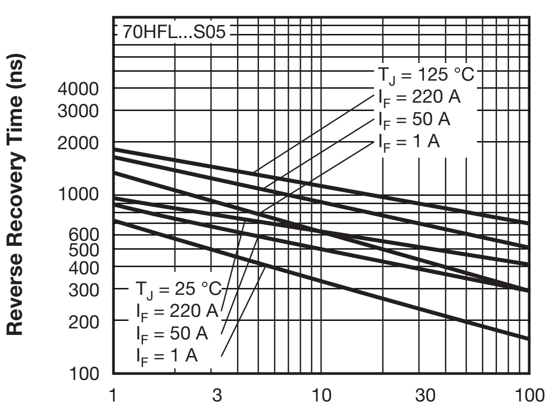


Fig. 27 - Typical Reverse Recovery Time vs. Rate of Fall of Forward Current, 70HFL...S05 Series

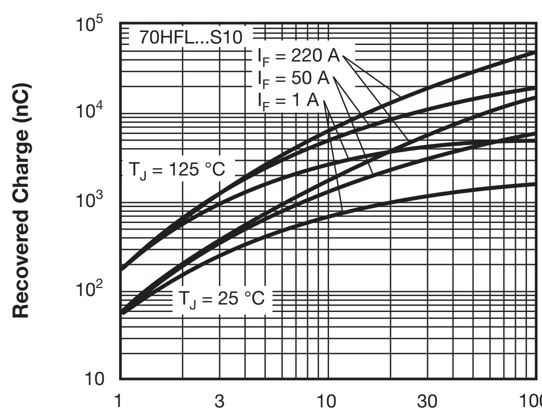
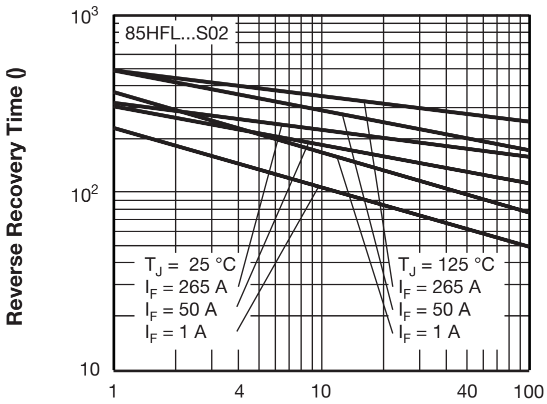
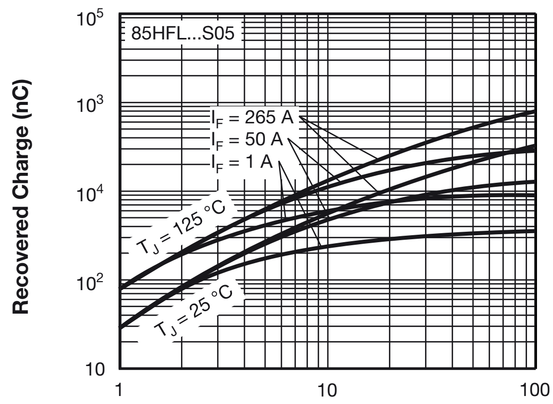


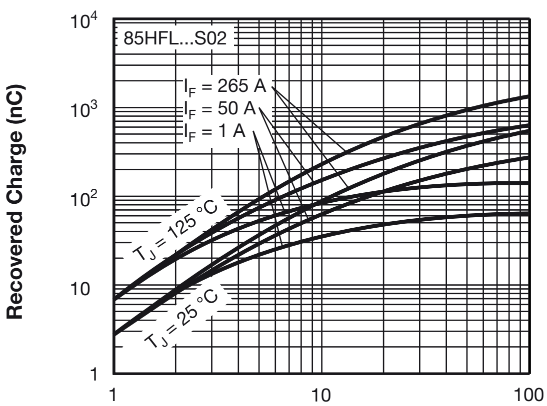
Fig. 30 - Typical Recovered Charge vs. Rate of Fall of Forward Current, 70HFL... Series



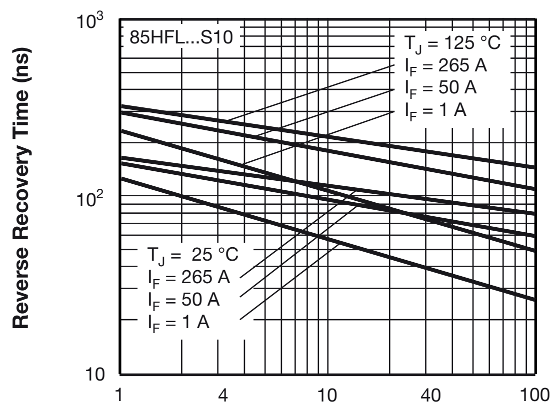
Rate of Fall of Forward Current (A/μs)
Fig. 31 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 85HFL...S02 Series



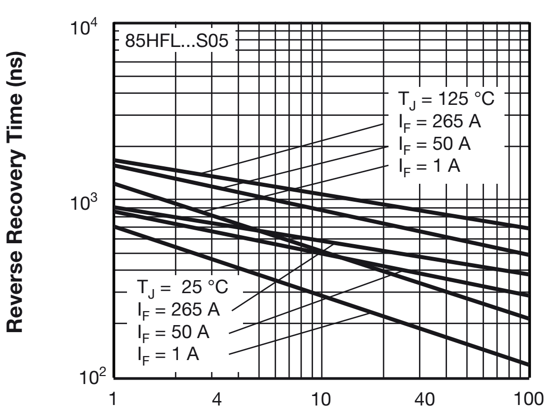
Rate of Fall of Forward Current (A/μs)
Fig. 34 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 85HFL...S05 Series



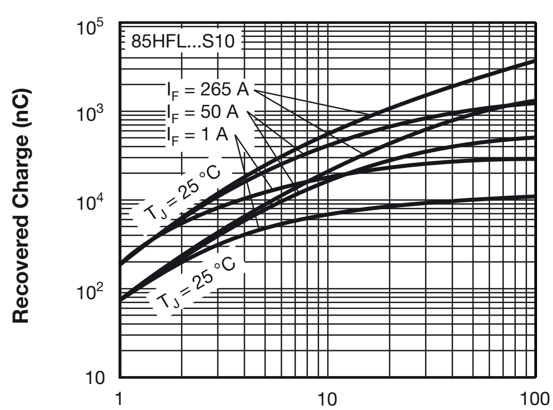
Rate of Fall of Forward Current (A/μs)
Fig. 32 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 85HFL...S02 Series



Rate of Fall of Forward Current (A/μs)
Fig. 35 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 85HFL... Series



Rate of Fall of Forward Current (A/μs)
Fig. 33 - Typical Reverse Recovery Time vs.
Rate of Fall of Forward Current, 85HFL...S05 Series

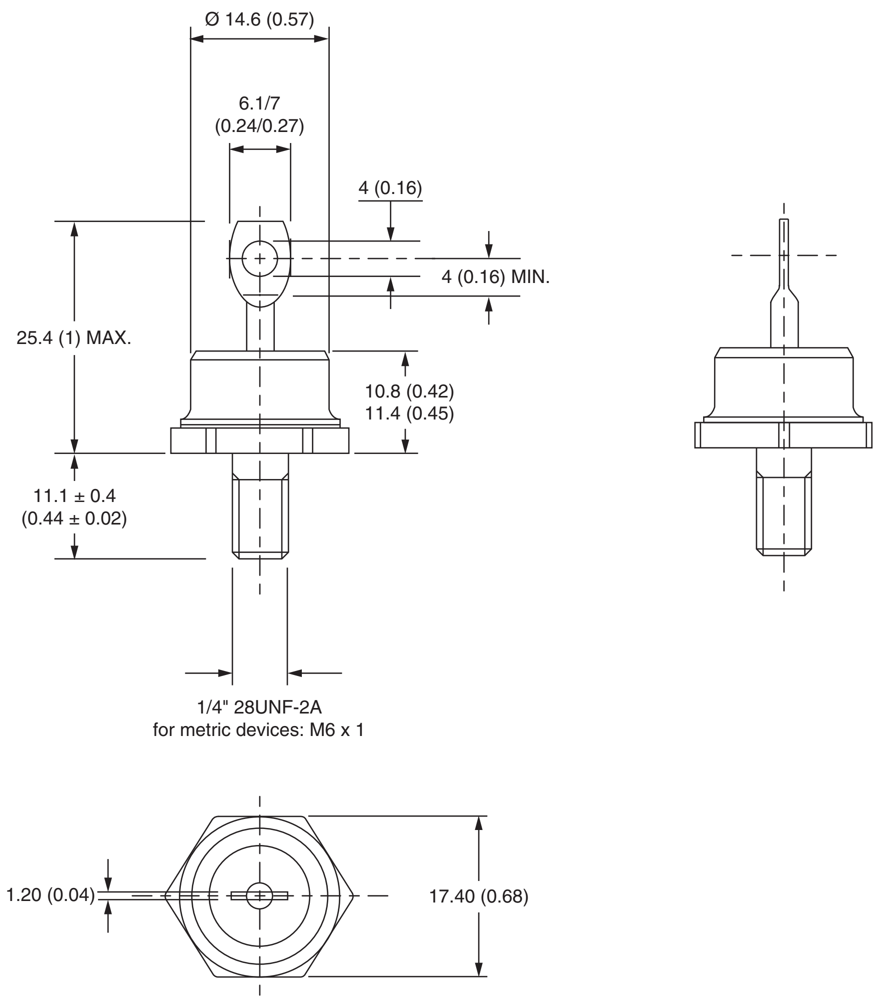


Rate of Fall of Forward Current (A/μs)
Fig. 36 - Typical Recovered Charge vs.
Rate of Fall of Forward Current, 85HFL... Series

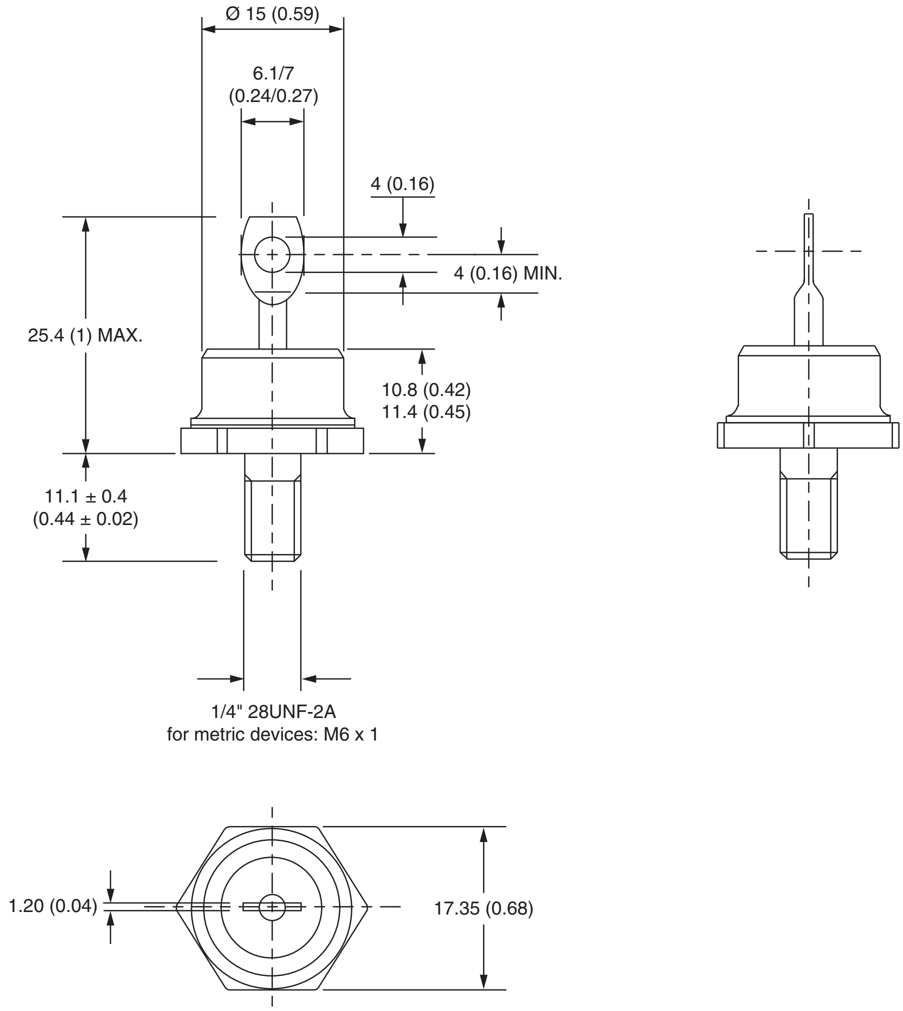
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95312

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

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



DIMENSIONS FOR 85HFL in millimeters (inches)



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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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