

INTERNATIONAL RECTIFIER

1N3879, 1N3889, 6FL, 12FL, 16FL SERIES

6A, 12A and 16A Fast Recovery Rectifiers

Major Ratings and Characteristics

	1N3879 —1N3883	1N3889 —1N3893	6FL...	12FL...	16FL...	Unit
$I_F(AV)^{\dagger}$	6*	12*	6	12	16	A
I_{FSM}	50Hz 72	145	110	145	180	A
	60Hz 75*	150*	115	150	190	A
I^2t	50Hz 26	103	60	103	160	A ² s
	60Hz 23	94	55	94	150	A ² s
$I_R \sqrt{t}$	363	1452	855	1452	2290	A $\sqrt{s}$
t_{rr} range	see table					ns
V_{RRM} range	50 — 400*		50 — 1000			V
T_J range	—65 to 150					°C

* JEDEC registered values.

† At max. $T_C = 100^\circ\text{C}$.

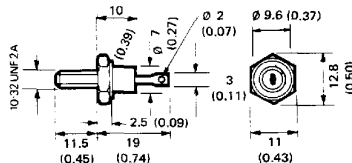
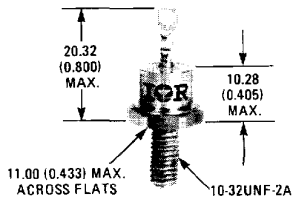
Description

This range of fast recovery diodes is designed for applications in DC power supplies, inverters, converters, choppers, ultrasonic systems and for use as free wheel diodes.

Features

- Short reverse recovery time
- Low stored charge
- Wide current range
- Excellent surge capabilities
- Standard JEDEC types
- Stud cathode and stud anode versions
- Types up to 1000V V_{RRM}
- Fully characterised reverse recovery conditions

CASE STYLE AND DIMENSIONS



Conforms to JEDEC: DO-203AA (DO-4)
IEC 191-2: A3U
BS 3934: SO-10A
DIN 41885: 101 C 2

All dimensions in millimetres (inches)

REVERSE VOLTAGE RATINGS

Part Number ① ②	VRRM — Max. Repetitive Peak Reverse Voltage		VRRM — Max. Non-Repetitive Peak Reverse Voltage $t_p \leq 5$ ms		IR — Max. Reverse Current At Rated VR		
	V		V		$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	$T_J = 150^\circ\text{C}$
1N3879	50		75	mA	0.015*	1.0*	3.0*
1N3880	100		150		0.015*	1.0*	3.0*
1N3881	200		250		0.015*	1.0*	3.0*
1N3882	300		350		0.015*	1.0*	3.0*
1N3883	400		450		0.015*	1.0*	3.0*
1N3889	50		75		0.025*	3.0*	5.0*
1N3890	100		150		0.025*	3.0*	5.0*
1N3891	200		250		0.025*	3.0*	5.0*
1N3892	300		350		0.025*	3.0*	5.0*
1N3893	400		450		0.025*	3.0*	5.0*
**6FL6S02	6FL6S05	6FL6S10	50	75	0.050	—	6.0
6FL10S02	6FL10S05	6FL10S10	100	150	0.050	—	6.0
6FL20S02	6FL20S05	6FL20S10	200	275	0.050	—	6.0
6FL40S02	6FL40S05	6FL40S10	400	500	0.050	—	6.0
6FL60S02	6FL60S05	6FL60S10	600	725	0.050	—	6.0
—	6FL80S05	6FL80S10	800	950	0.050	—	6.0
—	6FL100S05	6FL100S10	1000	1250	0.050	—	6.0
**12FL6S02	12FL6S05	12FL6S10	50	75	0.050	—	6.0
12FL10S02	12FL10S05	12FL10S10	100	150	0.050	—	6.0
12FL20S02	12FL20S05	12FL20S10	200	275	0.050	—	6.0
12FL40S02	12FL40S05	12FL40S10	400	500	0.050	—	6.0
12FL60S02	12FL60S05	12FL60S10	600	725	0.050	—	6.0
—	12FL80S05	12FL80S10	800	950	0.050	—	6.0
—	12FL100S05	12FL100S10	1000	1250	0.050	—	6.0
**16FL6S02	16FL6S05	16FL6S10	50	75	0.050	—	6.0
16FL10S02	16FL10S05	16FL10S10	100	150	0.050	—	6.0
16FL20S02	16FL20S05	16FL20S10	200	275	0.050	—	6.0
16FL40S02	16FL40S05	16FL40S10	400	500	0.050	—	6.0
16FL60S02	16FL60S05	16FL60S10	600	725	0.050	—	6.0
—	16FL80S05	16FL80S10	800	950	0.050	—	6.0
—	16FL100S05	16FL100S10	1000	1250	0.050	—	6.0

REVERSE RECOVERY CHARACTERISTICS

		1N3879 – 1N3883		1N3889 – 1N3893		6FL...			12FL...			16FL...			Unit	Conditions
						S02	S05	S10	S02	S05	S10	S02	S05	S10		
t_{rr}	Max. reverse recovery time	150	150	110	285	490	100	250	430	90	225	390	ns	$T_J = 25^\circ\text{C}, I_F = 1\text{ A to } V_R = 30\text{ V}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$		
		300*	300*	200	500	1000	200	500	1000	200	500	1000	ns	$T_J = 25^\circ\text{C}, dI_F/dt = 25\text{ A}/\mu\text{s}$		
IRM(REC) Max. peak reverse recovery current		4*	5*	—	—	—	—	—	—	—	—	—	—	IFM = $\pi \times$ rated IF(AV)		
QRR	Max. reverse recovered charge	400	350	230	1700	5000	200	1300	3800	150	1100	3000	nC	$T_J = 25^\circ\text{C}, I_F = 1\text{ A to } V_R = 30\text{ V}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$		
		400	400	200	1200	5000	200	1200	5000	200	1200	5000	nC	$T_J = 25^\circ\text{C}, dI_F/dt = 25\text{ A}/\mu\text{s}$ IFM = $\pi \times$ rated IF(AV)		

ELECTRICAL SPECIFICATIONS

		1N3879— 1N3883		6FL...		1N3889— 1N3893		12FL...		16FL...		Unit	Conditions	
FORWARD CONDUCTION														
$I_F(\text{AV})$ Max. average forward current		6*	6	12*	16	A		180° conduction, half sine wave, $T_C = 100^\circ\text{C}$						
$I_F(\text{RMS})$ Max. r.m.s. forward current		9.5	9.5	19	25	A								
I_{FSM} Max. peak one-cycle non-repetitive forward current		72	110	145	180	A		$t = 10\text{ ms}$ $t = 8.3\text{ ms}$ $t = 10\text{ ms}$ $t = 8.3\text{ ms}$	With rated V_{RRM} $V_{RRM} = 0$	Sinusoidal half wave, initial $T_J = 150^\circ\text{C}$				
		75*	115	150*	190									
		85	130	170	215									
		90	135	180	225									
i_2^2 Max. i_2^2 for fusing		26	60	103	160	A^2		$t = 10\text{ ms}$ $t = 8.3\text{ ms}$ $t = 10\text{ ms}$ $t = 8.3\text{ ms}$	With rated V_{RRM} $V_{RRM} = 0$	Initial $T_J = 150^\circ\text{C}$				
		23	55	94	150									
	Max. i_2^2 for individual device fusing	36	86	145	230									
		33	78	130	210									
$i_2^2 \sqrt{t}$ Max. $i_2^2 \sqrt{t}$ for individual device fusing	①	363	856	1452	2290	$i_2^2 \sqrt{t}$		$t = 0.1$ to 10 ms						
V_{FM} Max. peak forward voltage		1.4*	1.4	1.4*	1.4	V		$T_J = 25^\circ\text{C}, I_F = \text{rated } I_F(\text{AV})$ (D.C.) $T_C = 100^\circ\text{C}, I_{FM} = \pi \times \text{rated } I_F(\text{AV})$						
		1.5*	1.5	1.5*	1.5									

* JEDEC registered value

** Suffix "S02" may be omitted, i.e., 12FL10S2 implies 12FL10S02, 12FLR60 implies 12FLR60S02.

① Types listed are cathode to case; for anode-to-case include "R" in code, i.e., 1N3879R, 6FLR20S10, 16FLR40S02.

② $I_R(\text{AV})$ @ rated $I_F(\text{AV})$ and V_{RRM} , and $T_C = 100^\circ\text{C}$.③ I_{RM} @ rated V_{RRM} and $T_J = 150^\circ\text{C}$.④ i_2^2 for time $t_x = i_2^2 \sqrt{t} \cdot \sqrt{x}$

⑤ When these devices are ordered without a suffix, e.g., 40HFL, the order will be filled with devices that meet the S02 specification.

Thermal and mechanical specifications

			1N3879 -1N3883 6FL...	1N3889 -1N3893 12FL...	16FL...	Units	Conditions
T_J	Junction operating temperature range		-65 to 150			$^{\circ}\text{C}$	
T_{stg}	Storage temperature range		-65 to 175			$^{\circ}\text{C}$	
R_{thJC}	Maximum internal thermal resistance, junction to case		2.5	2.0	1.6	deg C/W	DC operation
R_{thCS}	Maximum thermal resistance, case to heatsink		0.5			deg C/W	Mounting surface flat, smooth and greased.
T	Mounting torque $\pm 10\%$	to nut	10.5			lb·f.in	Lubricated threads (Non-lubricated threads)
			0.12			kgf.m	
			1.2			Nm	
		to device	11.5 (13.5)			lb·f.in	
			0.13 (0.156)			kgf.m	
wt	Approximate weight		1.3 (1.35)			Nm	
			7			g	
			0.25			oz	
Case style			DO-203AA (DO-4)			JEDEC	

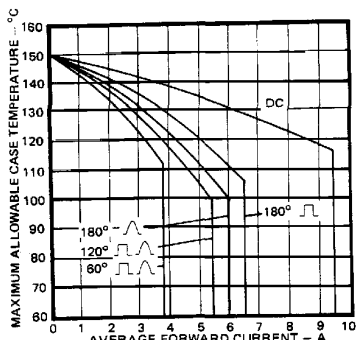


Fig. 1 - Average Forward Current Vs. Maximum Allowable Case Temperature, 1N3879 and 6FL Series

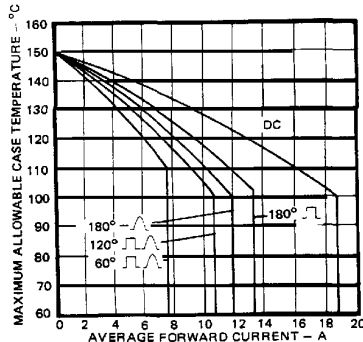


Fig. 2 - Average Forward Current Vs. Maximum Allowable Case Temperature, 1N3889 and 12FL Series

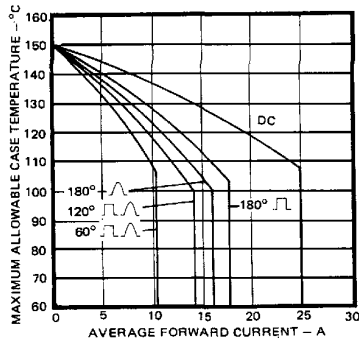
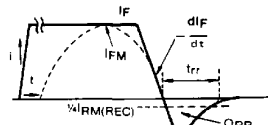


Fig. 3 - Average Forward Current Vs. Maximum Allowable Case Temperature, 16FL Series



- 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

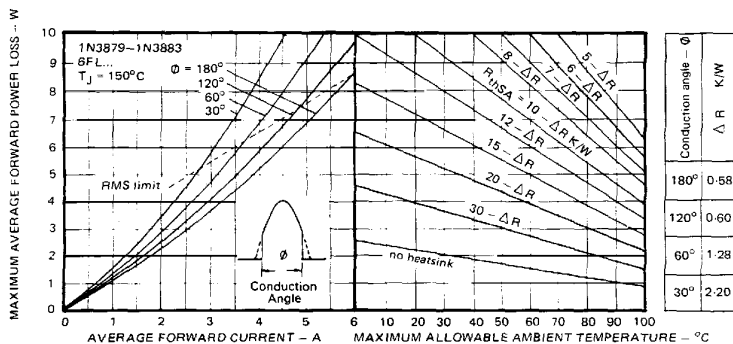


Fig. 5 - Current Rating Nomogram (Sinusoidal Waveforms), 1N3879 and 6FL Series

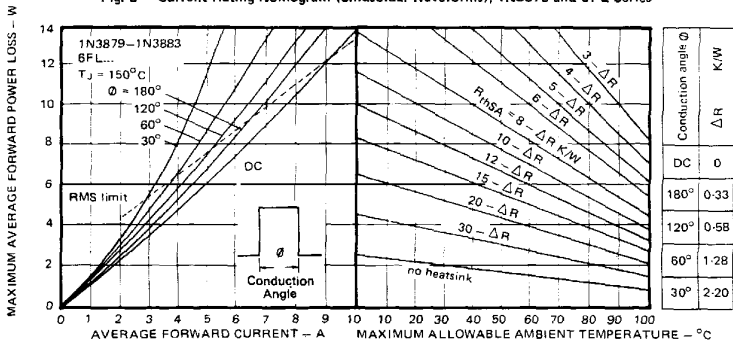


Fig. 6 - Current Rating Nomogram (Rectangular Waveforms), 1N3879 and 6FL Series

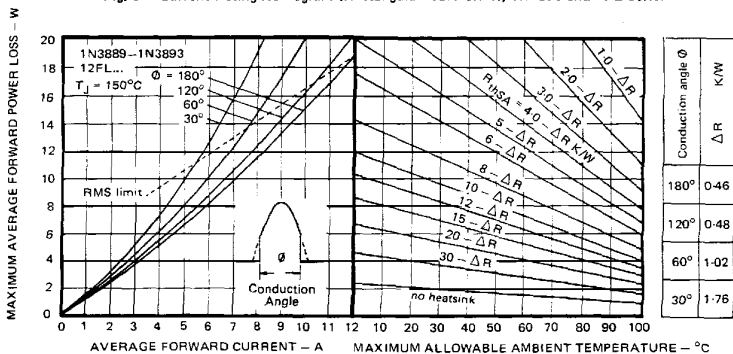
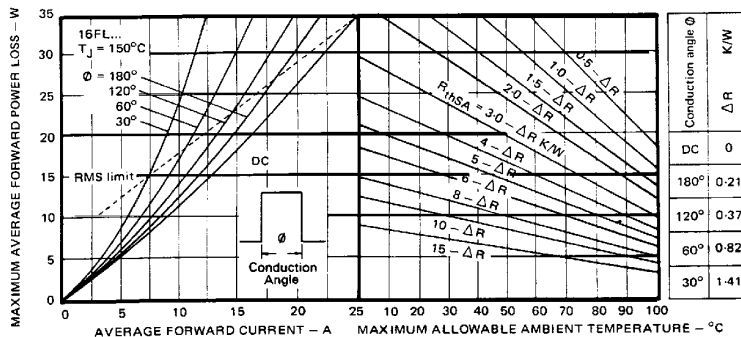
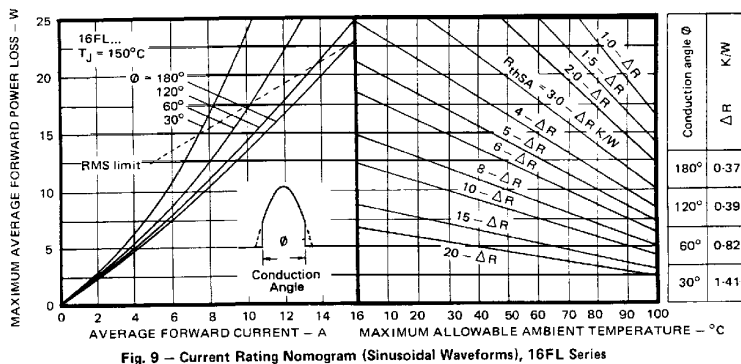
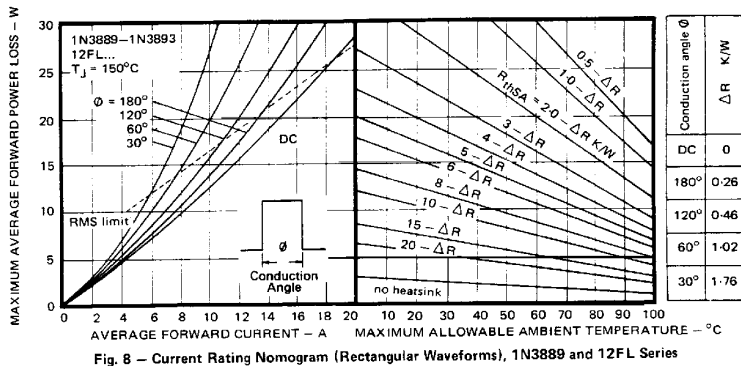


Fig. 7 - Current Rating Nomogram (Sinusoidal Waveforms), 1N3889 and 12FL Series



1N3879, 1N3889, 6FL, 12FL, 16FL Series

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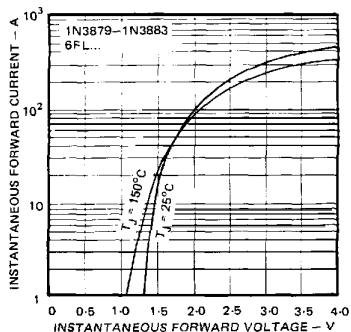


Fig. 11 - Maximum Forward Voltage Vs. Forward Current, 1N3879 and 6FL Series

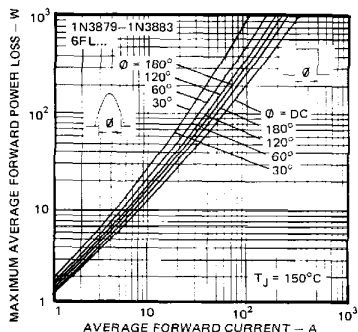


Fig. 12 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N3879 and 6FL Series

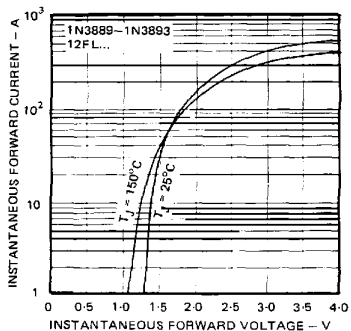


Fig. 13 - Maximum Forward Voltage Vs. Forward Current, 1N3889 and 12FL Series

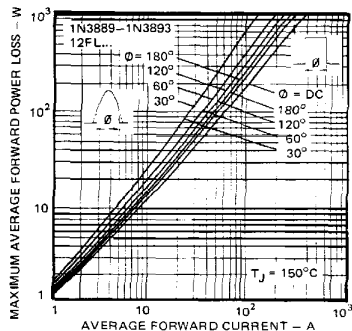


Fig. 14 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N3889 and 12FL Series

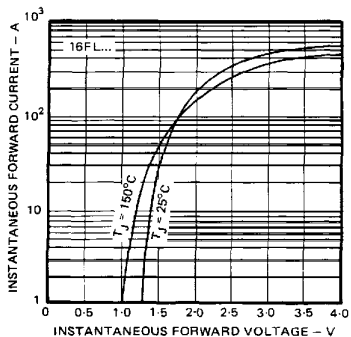


Fig. 15 - Maximum Forward Voltage Vs. Forward Current, 16FL Series

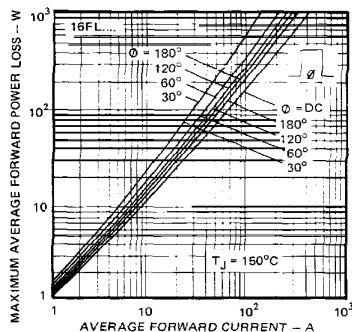


Fig. 16 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 16FL Series



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1N3879, 1N3889, 6FL, 12FL, 16FL Series

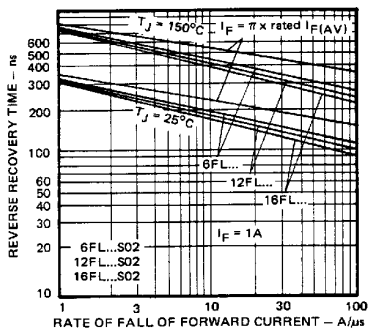


Fig. 17A — Maximum Reverse Recovery Time Vs. Rate of Fall of Forward Current, All Series __S02

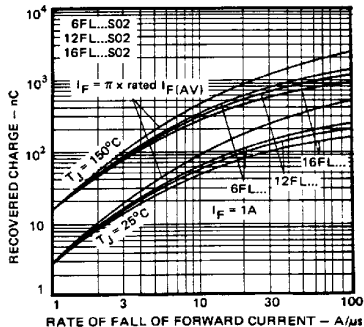


Fig. 17B — Maximum Recovered Charge Vs. Rate of Fall of Forward Current, All Series __S02

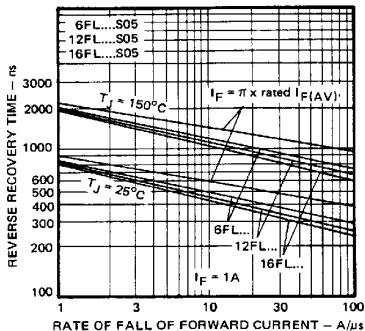


Fig. 18A — Maximum Reverse Recovery Time Vs. Rate of Fall of Forward Current, All Series __S05

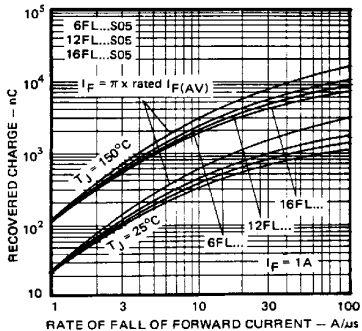


Fig. 18B — Maximum Recovered Charge Vs. Rate of Fall of Forward Current, All Series __S05

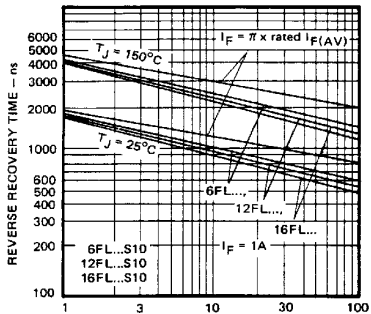


Fig. 19A — Maximum Reverse Recovery Time Vs. Rate of Fall of Forward Current, All Series __S10

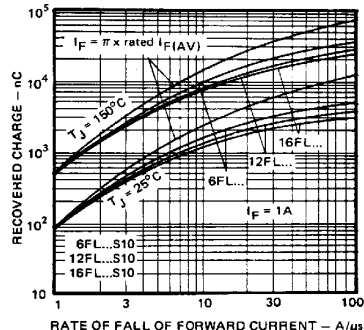


Fig. 19B — Maximum Recovered Charge Vs. Rate of Fall of Forward Current, All Series __S10

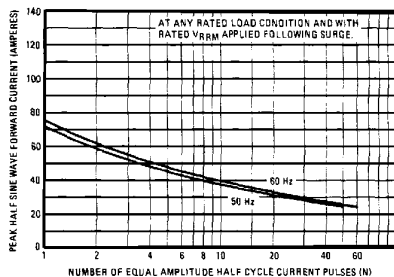


Fig. 20 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N3879 Series

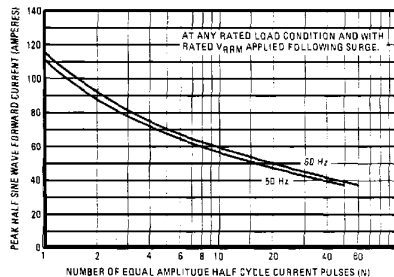


Fig. 21 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 6FL Series

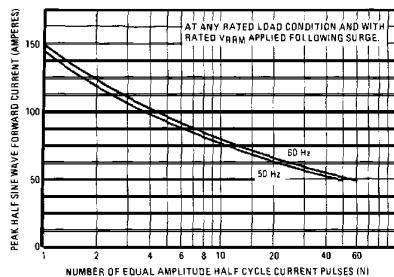


Fig. 22 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N3889 and 12FL Series

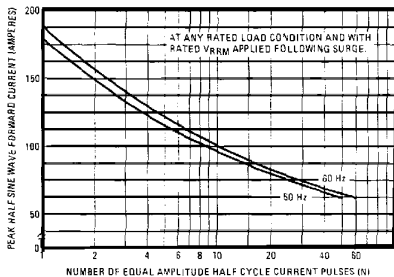


Fig. 23 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 16FL Series

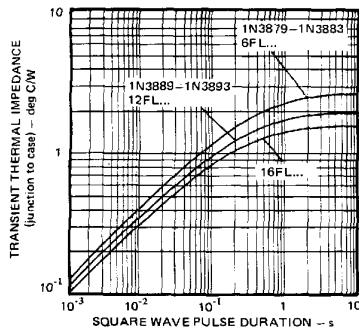


Fig. 24 - Maximum Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration, All Series.



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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