

## 12F(R) SERIES

### STANDARD RECOVERY DIODES

Stud Version

#### Features

- High surge current capability
- Avalanche types available
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200V  $V_{RRM}$

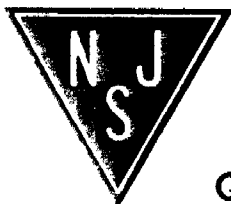
12 A

#### Typical Applications

- Battery charges
- Converters
- Power supplies
- Machine tool controls

#### Major Ratings and Characteristics

Parameters	12F(R)	Units
$I_{F(AV)}$	12	A
@ $T_C$	144	$^{\circ}C$
$I_{F(RMS)}$	19	A
$I_{FSM}$ @ 50Hz	265	A
@ 60Hz	280	A
$T^2t$ @ 50Hz	351	$A^2s$
@ 60Hz	320	$A^2s$
$V_{RRM}$ range	100 to 1200	V
$T_J$ range	- 65 to 175	$^{\circ}C$



## 12F(R) Series

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

Type number	Voltage Code	$V_{RRM}$ , maximum repetitive peak reverse voltage V	$V_{RSM}$ , maximum non-repetitive peak reverse voltage V	$V_{RIBR}$ , minimum avalanche voltage V (1)	$I_{RRM}$ max. @ $T_J = 175^\circ\text{C}$ mA
12F(R)	10	100	150	—	12
	20	200	275	—	
	40	400	500	500	
	60	600	725	750	
	80	800	950	950	
	100	1000	1200	1150	
	120	1200	1400	1350	

(1) Avalanche version only available from  $V_{RRM}$  400V to 1200V.

#### Forward Conduction

Parameter	12F(R)	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	12 144	A °C	180° conduction, half sine wave
$I_{C(RMS)}$ Max. RMS forward current	19	A	
$P_R$ Maximum non-repetitive peak reverse power	7	KW	10 $\mu$ s square pulse, $T_J = T_J$ max. see note (2)
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	265	A	t = 10ms No voltage reappplied
	280		t = 8.3ms 100% $V_{RRM}$ reappplied
	225		t = 10ms 100% $V_{RRM}$ reappplied
	235		t = 8.3ms 100% $V_{RRM}$ reappplied
$I^2t$ Maximum $I^2t$ for fusing	351	A <sup>2</sup> s	t = 10ms No voltage reappplied
	320		t = 8.3ms 100% $V_{RRM}$ reappplied
	250		t = 10ms 100% $V_{RRM}$ reappplied
	226		t = 8.3ms 100% $V_{RRM}$ reappplied
$I^2t$ Maximum $I^2t$ for fusing	3510	A <sup>2</sup> s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.77	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	0.97		$(I > \pi \times I_{F(AV)}), T_J = T_J$ max.
$r_{\theta 1}$ Low level value of forward slope resistance	10.70	m $\Omega$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J$ max.
$r_{\theta 2}$ High level value of forward slope resistance	6.20		$(I > \pi \times I_{F(AV)}), T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.26	V	$I_{pk} = 38A, T_J = 25^\circ\text{C}, t_p = 400\mu\text{s}$ rectangular wave

(2) Available only for Avalanche version, all other parameters the same as 12F.

## 12F(R) Series

### Thermal and Mechanical Specifications

Parameter	12F(R)	Units	Conditions
$T_j$ Max. junction operating temperature range	-65 to 175	°C	
$T_{stg}$ Max. storage temperature range	-65 to 200		
$R_{thJC}$ Max. thermal resistance, junction to case	2	K/W	DC operation
$R_{thCS}$ Max. thermal resistance, case to heatsink	0.5		Mounting surface, smooth, flat and greased
T Mounting torque, $\pm 10\%$	1.2 (1.5)	Nm	Lubricated threads (Not lubricated threads)
wt Approximate weight	7 (0.25)	g (oz)	
Case style	DO-203AA (DO-4)		See Outline Table

### $\Delta R_{thJC}$ Conduction

(The following table shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.33	0.26	K/W	$T_j = T_{j \text{ max.}}$
120°	0.41	0.44		
90°	0.53	0.58		
60°	0.78	0.81		
30°	1.28	1.29		

### Ordering Information Table

Device Code	
A	12 F R 120 M
①	② ③ ④ ⑤ ⑥
<b>1</b> - A = Avalanche diode None = Standard diode	
<b>2</b> - Current rating: Code = $I_{F(AV)}$	
<b>3</b> - F = Standard device	
<b>4</b> - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)	
<b>5</b> - Voltage code: Code x 10 = $V_{RRM}$ (See Voltage Ratings table)	
<b>6</b> - None = Stud base DO-203AA (DO-4) 10-32UNF-2A M = Stud base DO-203AA (DO-4) M5 X 0.8 - (Not available for Avalanche diodes)	

## 12F(R) Series

Outlines Table

