SCOMES

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SCD87

Power Rectifier Diodes

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V V_{RRM}
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

TYPICAL APPLICATIONS

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

Parameters		SCD87		Units
		10 to 120	140 to 160	
$I_{F(AV)}$		85	85	A
	@ T_C	140	110	°C
$I_{F(RMS)}$		133		A
I_{FSM}	@ 50Hz	1700		A
	@ 60Hz	1800		A
I^2t	@ 50Hz	14500		A^2s
	@ 60Hz	13500		A^2s
V_{RRM}	range	100 to 1200	1400 to 1600	V
T_J	range	- 65 to 180	- 65 to 150	°C

MAJOR RATINGS AND CHARACTERISTICS				
PARAMETER	TEST CONDITIONS	SCD87		UNITS
		10 TO 120	140/160	
$I_{F(AV)}$		85		A
	T_C	140	110	°C
$I_{F(RMS)}$		133		A
I_{FSM}	50 Hz	1700		A
	60 Hz	1800		
I^2t	50 Hz	14 500		A^2s
	60 Hz	13 500		
V_{RRM}	Range	100 to 1200	1400/1600	V
T_J		- 65 to 180	- 65 to 150	°C

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT $T_J = T_J$ MAXIMUM mA
SCD87	10	100	200	9
	20	200	300	
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	4.5
	160	1600	1700	

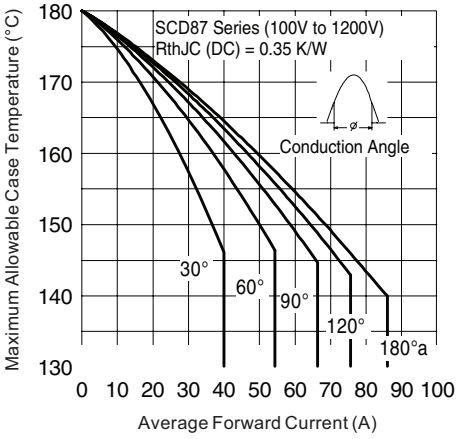
FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			SCD87		UNITS
					10 to 120	140/160	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			85		A
					140	110	°C
Maximum RMS forward current	$I_{F(RMS)}$				133		A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	1700		A
		t = 8.3 ms			1800		
		t = 10 ms	100 % V_{RRM} reapplied		1450		
		t = 8.3 ms			1500		
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		14 500		A^2s
		t = 8.3 ms			13 500		
		t = 10 ms	100 % V_{RRM} reapplied		10 500		
		t = 8.3 ms			9400		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			16 000		$A^2\sqrt{s}$
Value of threshold voltage (up to 1200 V)	$V_{F(TO)}$	$T_J = T_J$ maximum			0.68		V
Value of threshold voltage (for 1400 V, 1600 V)					0.69		
Value of forward slope resistance (up to 1200 V)	r_f	$T_J = T_J$ maximum			1.62		mΩ
Value of forward slope resistance (for 1400 V, 1600 V)					1.75		
Maximum forward voltage drop	V_{FM}	I_{pk} = 267 A, T_J = 25 °C, t_p = 400 µs rectangular wave			1.2	1.4	V

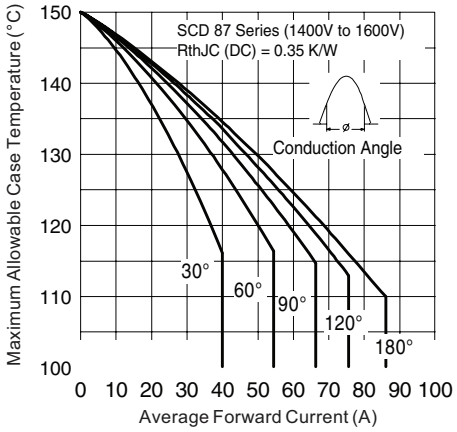
THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS	SCD87		UNITS
			10 to 120	140/160	
Maximum junction operating and storage temperature range	T_J, T_{Stg}		- 65 to 180	- 65 to 150	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.35		K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.25		
Maximum shock (1)			1500		g
Maximum constant vibration (1)		50 Hz	20		
Maximum constant acceleration (1)		Stud outwards	5000		
Maximum allowable mounting torque (+ 0 %, - 10 %)		Not lubricated thread, tighting on nut (2)	3.4 (30)		N · m (lbf · in)
		Lubricated thread, tighting on nut (2)	2.3 (20)		
		Not lubricated thread, tighting on hexagon (3)	4.2 (37)		
		Lubricated thread, tighting on hexagon (3)	3.2 (28)		
Approximate weight		Unleaded device	17		g
			0.6		oz.
Case style		See dimensions - link at the end of datasheet	DO-203AB (DO-5)		

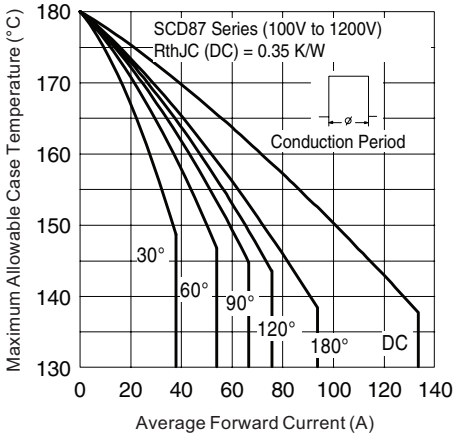
ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.10	0.08	$T_J = T_J$ maximum	K/W
120°	0.11	0.11		
90°	0.13	0.13		
60°	0.17	0.17		
30°	0.26	0.26		

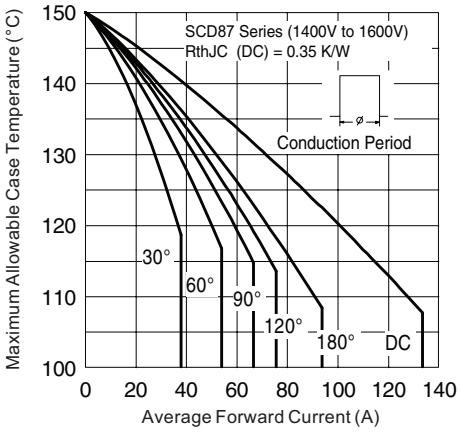
Note

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









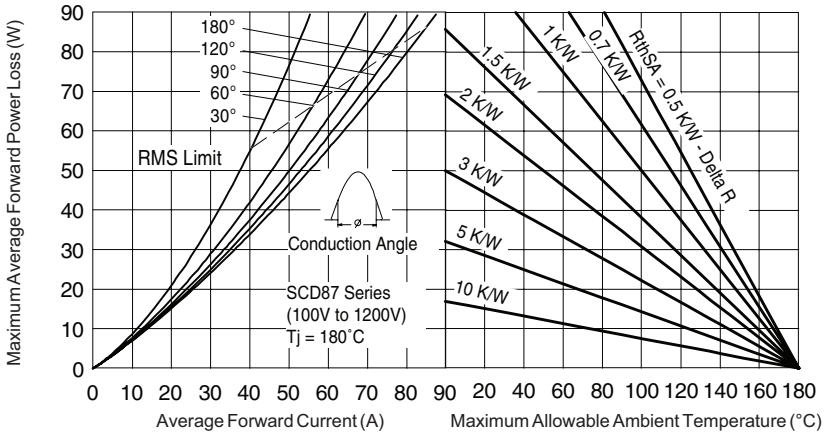


Fig. 5 - Forward Power Loss Characteristics

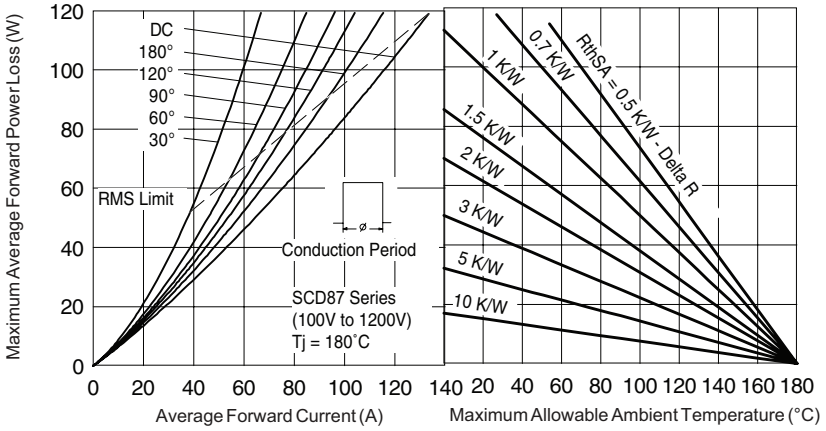


Fig. 6 - Forward Power Loss Characteristics

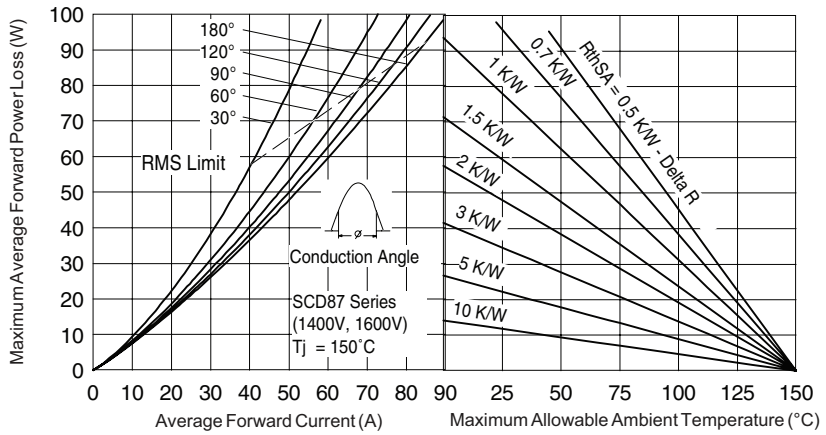


Fig. 7 - Forward Power Loss Characteristics

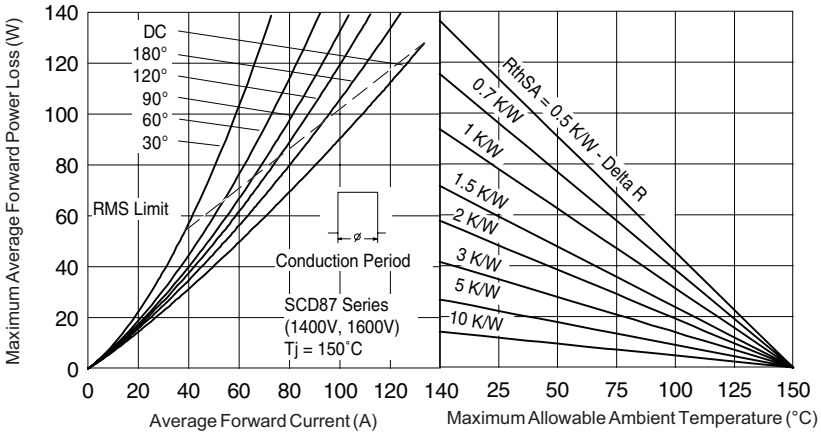


Fig. 8 - Forward Power Loss Characteristics

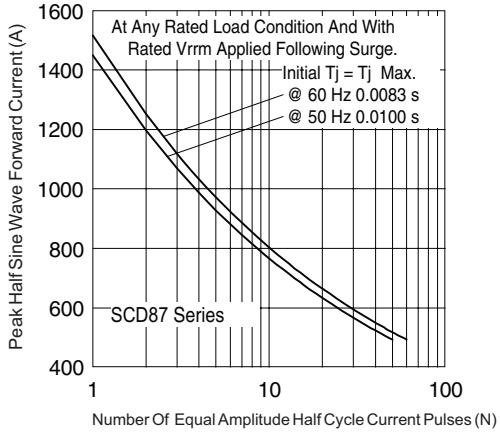


Fig. 9 - Maximum Non-Repetitive Surge Current

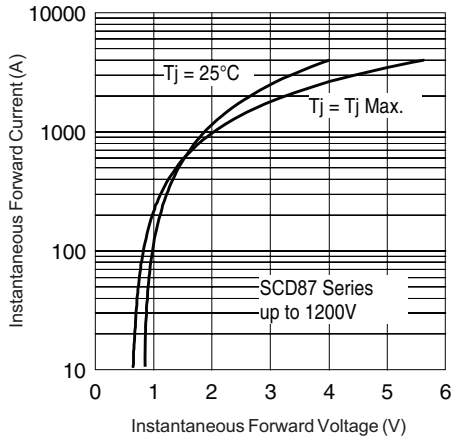


Fig. 11 - Forward Voltage Drop Characteristics (up to 1200 V)

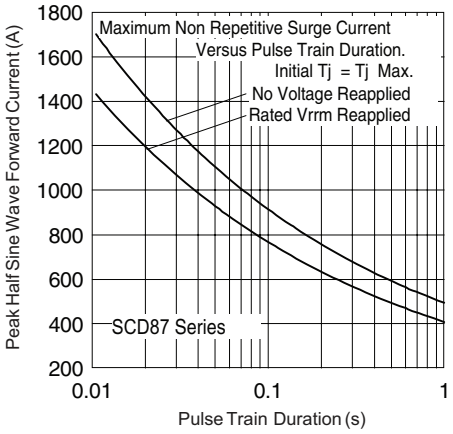


Fig. 10 - Maximum Non-Repetitive Surge Current

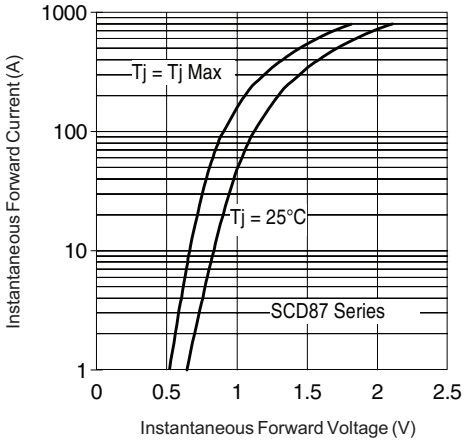
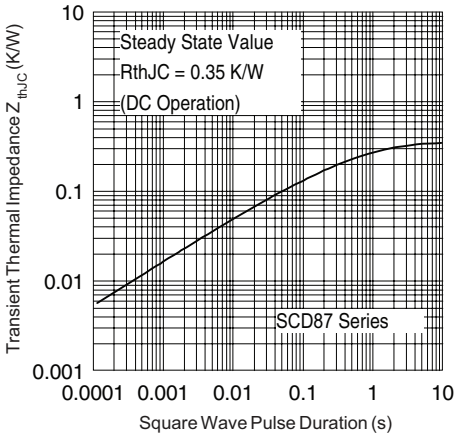
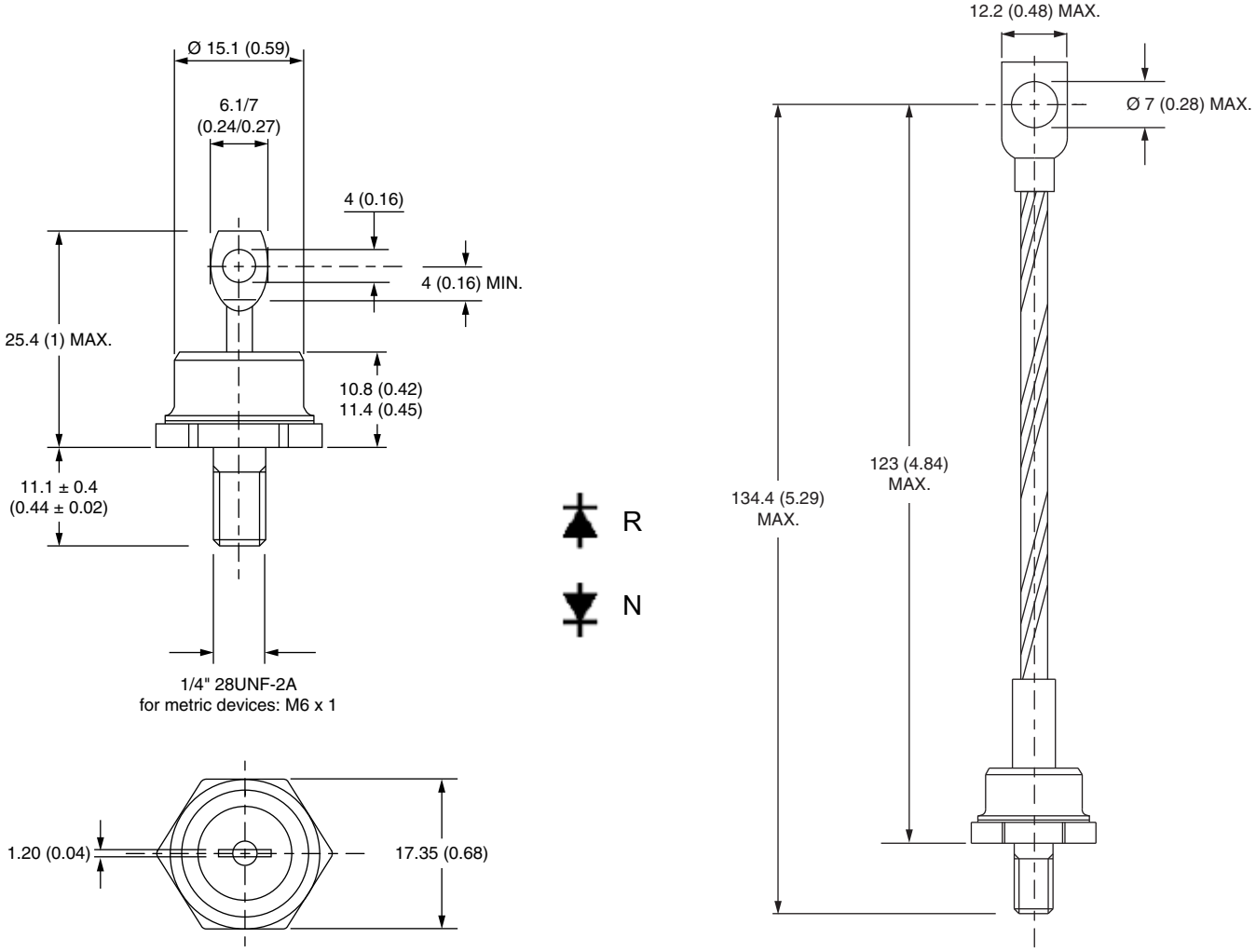


Fig. 12 - Forward Voltage Drop Characteristics (for 1400 V, 1600 V)





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