

## SCD46.12



### Power Rectifier Diodes

#### FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V  $V_{RRM}$
- Designed and qualified for multiple level
- Material categorization: for definitions of compliance please see

#### TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
Package	DO-5 (DO-203AB)
Circuit configuration	Single



**RoHS**  
COMPLIANT

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	SCD46.12	UNITS
$I_{F(AV)}$		40	A
	$T_C$	140	°C
$I_{F(RMS)}$		62	A
$I_{FSM}$	50 Hz	570	A
	60 Hz	595	
$I^2t$	50 Hz	1600	A <sup>2</sup> s
	60 Hz	1450	
$V_{RRM}$	Range	1200	V
$T_J$		65 to 180	°C

#### 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	$I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA
SCD46.12	120	1200	1300	9

<b>FORWARD CONDUCTION</b>						
PARAMETER	SYMBOL	TEST CONDITIONS		SCD46.12	Units	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		40	A	
				140	°C	
Maximum RMS forward current	$I_{F(RMS)}$			62	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	A	
		t = 8.3 ms				
		t = 10 ms	100 % $V_{RRM}$ reapplied			
		t = 8.3 ms				
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied		A <sup>2</sup> s	
		t = 8.3 ms				
		t = 10 ms	100 % $V_{RRM}$ reapplied			
		t = 8.3 ms				
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied		16 000	A <sup>2</sup> √s	
Value of threshold voltage (up to 1200 V)	$V_{F(TO)}$	$T_J = T_J$ maximum		0.65	V	
Value of threshold voltage (for 1400 V/1600 V)	$V_{F(TO)}$			0.76		
Value of forward slope resistance (up to 1200 V)	$r_f$	$T_J = T_J$ maximum		4.29	mΩ	
Value of forward slope resistance (for 1400 V/1600 V)	$r_f$			3.8		
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 125$ A, $T_J = 25$ °C, $t_p = 400$ μs rectangular wave		1.30	1.50	V

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>					
PARAMETER	SYMBOL	TEST CONDITIONS		SCD46.12	Units
Maximum junction operating and storage temperature range	$T_J, T_{Stg}$			65 to 190	°C
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation		0.95	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, tightening on nut <sup>(1)</sup>		3.4 (30)	N · m (lbf · in)
		Lubricated thread, tightening on nut <sup>(1)</sup>		2.3 (20)	
		Not lubricated thread, tightening on hexagon <sup>(2)</sup>		4.2 (37)	
		Lubricated thread, tightening on hexagon <sup>(2)</sup>		3.2 (28)	
Approximate weight				17	g
				0.6	oz.
Case style		See dimensions - link at the end of datasheet		DO-5 (DO-203AB)	

**Notes**

- <sup>(1)</sup> Recommended for pass-through holes
- <sup>(2)</sup> Recommended for holed threaded heatsinks

<b><math>\Delta R_{thJC}</math> CONDUCTION</b>				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.14	0.10	$T_J = T_J$ maximum	K/W
120°	0.16	0.17		
90°	0.21	0.22		
60°	0.30	0.31		
30°	0.50	0.50		

**Note**

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

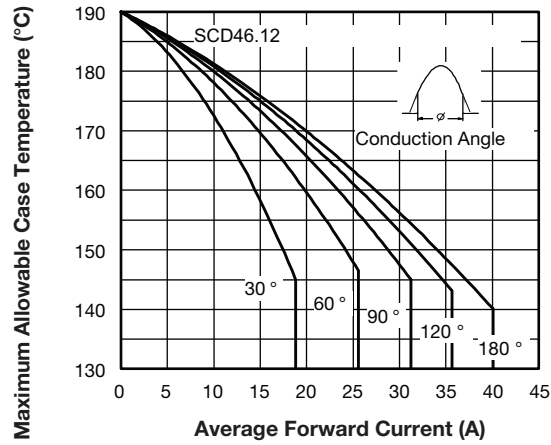


Fig. 1 - Current Ratings Characteristics

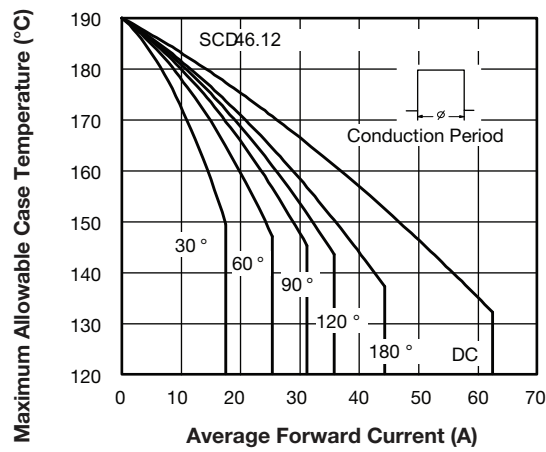


Fig. 2 - Current Ratings Characteristics

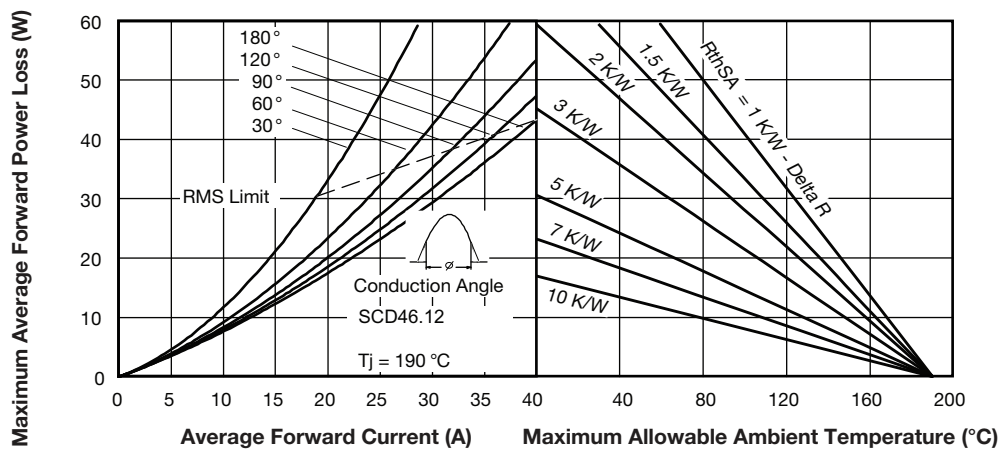


Fig. 5 - Forward Power Loss Characteristics

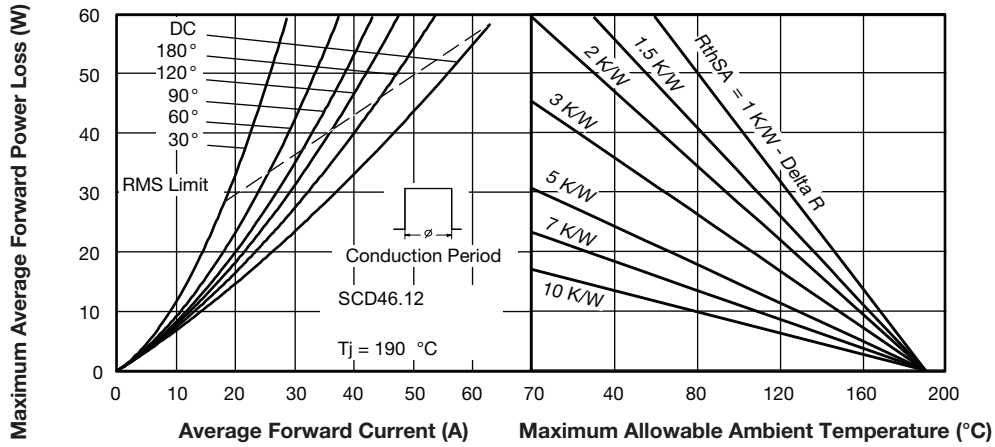


Fig. 6 - Forward Power Loss Characteristics

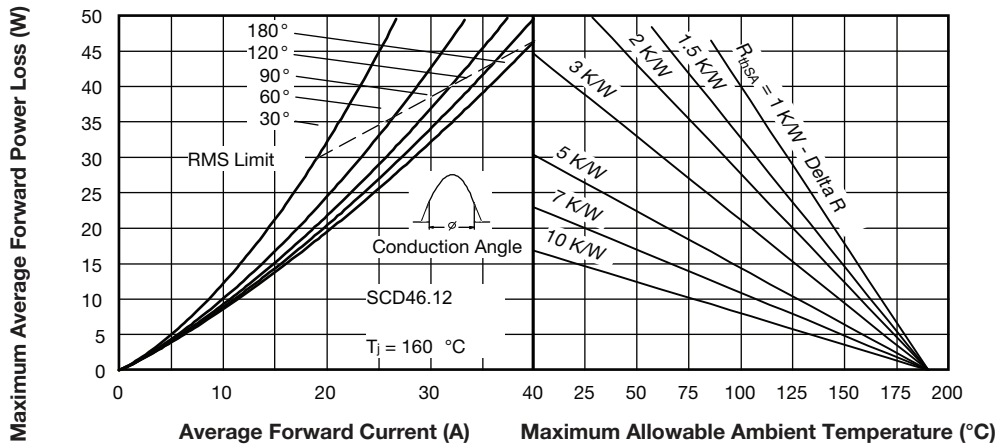


Fig. 7 - Forward Power Loss Characteristics

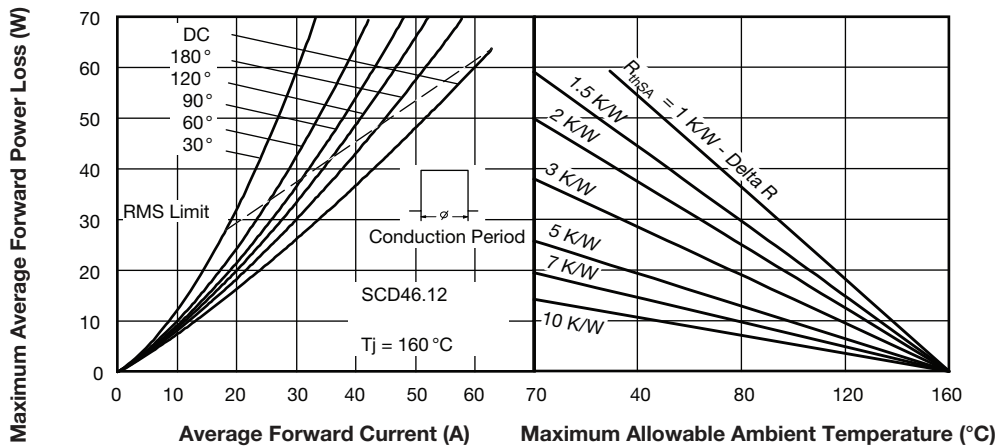


Fig. 8 - Forward Power Loss Characteristics

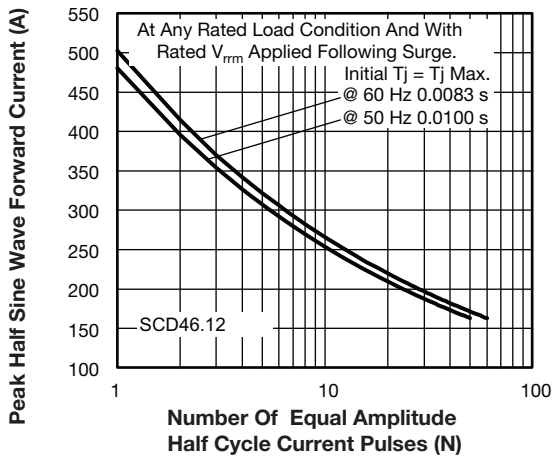


Fig. 9 - Maximum Non-Repetitive Surge Current

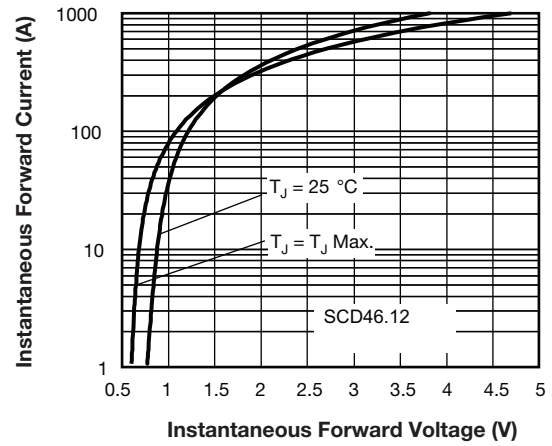


Fig. 11 - Forward Voltage Drop Characteristics (Up To 1200 V)

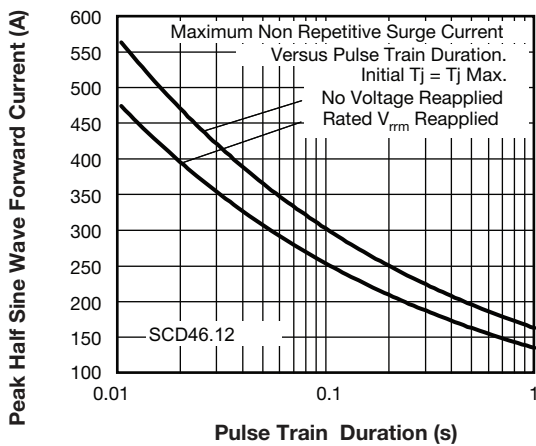


Fig. 10 - Maximum Non-Repetitive Surge Current

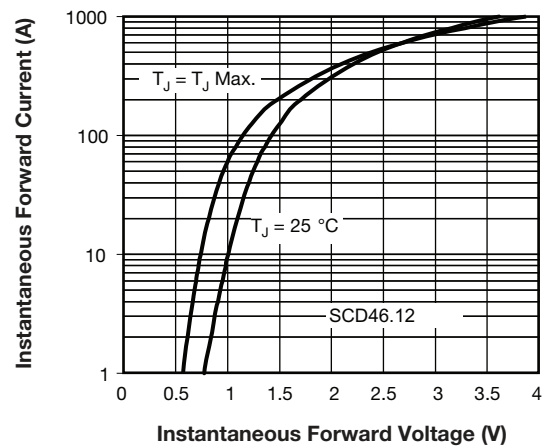


Fig. 12 - Forward Voltage Drop Characteristics (For 1400 V/1600 V)

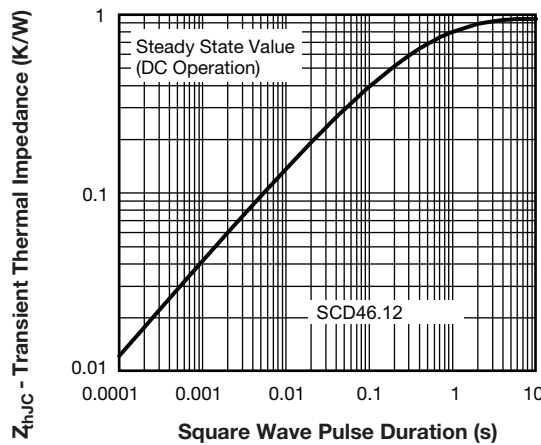
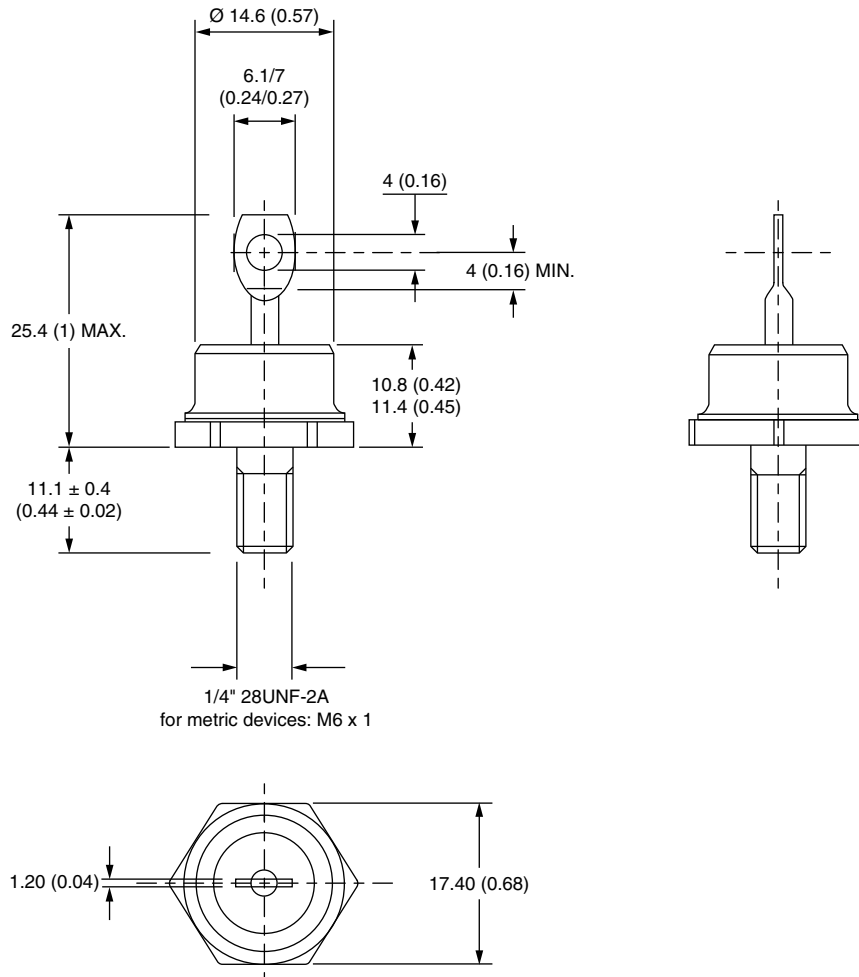



Fig. 13 - Thermal Impedance  $Z_{thJC}$  Characteristics

**DIMENSIONS** in millimeters (inches)



SCD46.12R A to stud 

SCD46.12N K to stud 