



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, CA 90638

Phone: (562) 404-4474 * Fax: (562) 404-1773

ssdi@ssdi-power.com * www.ssdi-power.com

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFC80N200

Screening^{2/}
 ___ = Not Screened
 TX = TX Level
 TXV = TXV Level
 S = S Level

Lead Bend Options (TO-254 only)

___ = Straight Leads
 DB = Down Bend
 UB = Up Bend

Package

S1 = SMD1
 S1L = SMD1 with leads
 M = TO-254

SFC80N200

80 AMP, 2 kV, 28 mΩ
SiC Power MOSFET
Enhancement Mode N-Channel

Features:

- Fast Switching, Low Capacitance
- High Blocking Voltage, Low $R_{DS(ON)}$
- Easy to Parallel, Simple to Drive
- Resistant to Latch-Up
- Hermetically Sealed Power Packaging
- TX, TXV, S-Level Screening Available

Applications:

- High Voltage DC-DC Converters
- Solar Inverters
- Switch Mode Power Supplies
- Motor Drive
- Pulsed Power Applications
- Aerospace, Hi-Rel, Military

Maximum Ratings^{3/}

	Symbol	Value	Unit
Drain – Source Voltage	V_{DS}	2000	V
Gate – Source Voltage, dynamic AC ($f > 1$ Hz)	V_{GS1}	-8, +19	V
Gate – Source Voltage, static	V_{GS2}	-4, +15	V
Continuous Drain Current SMD1, SMD1L $V_{GS} = 15$ V, $T_c = 25^\circ\text{C}$	I_{D1}	80 55	A
Pulsed Drain Current Pulse width t_P limited by T_{Jmax}	I_{D2}	249	A
Total Power Dissipation	P_D	288	W
Operating & Storage Temperature	T_{OP} & T_{STG}	-55 to +175	$^\circ\text{C}$
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$	0.52 (typ 0.38)	$^\circ\text{C/W}$

**SMD1
(S1)**



**SMD1 with Leads
(S1L)****



**TO-254
(M)**



NOTES: *Pulsed per MIL-STD-750.

^{1/} For ordering information, price, and availability - contact factory.

^{2/} Screening based on MIL-PRF-19500. Screening flows available on request.

^{3/} Unless otherwise specified, all electrical characteristics @ 25°C .

****Customizable ribbon leads option reduces risk of vibration stress and thermal fatigue**

*****dime used for size reference**

NOTE: All specifications are subject to change without notification.
 SCD's for these devices should be reviewed by SSDI prior to release.

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Electrical Characteristics ^{3/}		Symbol	Min	Typ	Max	Unit	
Drain - Source Breakdown Voltage V _{GS} = 0 V, I _D = 100 μA		V _{(BR)DSS}	2000	-	-	V	
Gate Threshold Voltage V _{DS} = V _{GS} , I _D = 25 mA V _{DS} = V _{GS} , I _D = 25 mA, T _J = 150°C		V _{GS(th)}	1.8 -	2.5 2.0	3.6 -	V	
Zero Gate Voltage Drain Current V _{DS} = 1800 V, V _{GS} = 0 V		I _{DSS}	-	2	100	μA	
Gate - Source Leakage V _{GS} = 15 V, V _{DS} = 0 V		I _{GSS}	-	5	250	nA	
Drain - Source On-State Resistance V _{GS} = 15 V, I _D = 50 A V _{GS} = 15 V, I _D = 50 A, T _J = 150°C		R _{DS(on)}	- -	21 43	28 -	mΩ	
Forward Transconductance V _{DS} = 20 V, I _{DS} = 50 A V _{DS} = 20 V, I _{DS} = 50 A, T _J = 150°C		g _{fs}	- -	63 61	- -	S	
Input Capacitance Output Capacitance Reverse Transfer Capacitance V _{GS} = 0 V, V _{DS} = 1000 V, f = 1 MHz, V _{AC} = 25 mV		C _{iss} C _{oss} C _{rss}	- - -	7667 188 10	- - -	pF	
C _{oss} Stored Energy V _{GS} = 0 V, V _{DS} = 1000 V, f = 100 kHz, V _{AC} = 25 mV		E _{oss}	-	292	-	μJ	
Turn-On Switching Energy (SiC Diode FWD)	V _{DS} = 1200 V V _{GS} = -5 V / +20 V I _D = 50 A R _{G(ext)} = 2.5 Ω L = 105 μH T _J = 150°C	E _{ON}	-	2.1	-	mJ	
Turn-Off Switching Energy (SiC Diode FWD)		E _{OFF}	-	0.86	-	mJ	
Turn-On Switching Energy (Body Diode FWD)		E _{ON}	-	4.7	-	mJ	
Turn-Off Switching Energy (Body Diode FWD)		E _{OFF}	-	0.93	-	mJ	
Turn On Delay Time Rise Time Turn Off Delay Time Fall Time	V _{DD} = 1200 V, V _{GS} = -5 V / 20 V, I _D = 50 A, R _{G(ext)} = 2.5 Ω, Timing relative to V _{DS} Inductive load	t _{d(on)} t _r t _{d(off)} t _f	- - - -	65 20 48 18	- - - -	ns	
Internal Gate Resistance V _{AC} = 25 mV, f = 1 MHz		R _{G(Int)}	-	7.4	-		Ω
Gate to Source Charge Gate to Drain Charge Total Gate Charge	V _{DS} = 1200 V, V _{GS} = -5 V / 15 V I _D = 50 A	Q _{gs} Q _{gd} Q _g	- - -	80 70 249	- - -		nC
Reverse Diode Characteristics ^{3/}		Symbol	Min	Typ	Max		Unit
Diode Forward Voltage V _{GS} = -4 V, I _{SD} = 41 A V _{GS} = -4 V, I _{SD} = 41 A, T _J = 150°C		V _{SD}	- -	4.9 4.3	- -	V	
Reverse Recovery Time	V _{GS} = -4 V, I _{SD} = 50 A, V _R = 1200 V, dif/dt = 4000 A/μs, T _J = 150°C	t _{rr}	-	43	-	ns	
Reverse Recovery Charge		Q _{rr}	-	2557	-	nC	
Peak Reverse Recovery Current		I _{rrm}	-	87	-	A	

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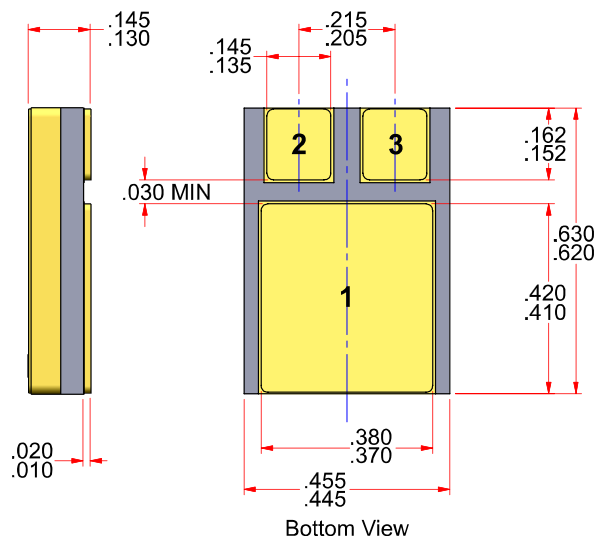


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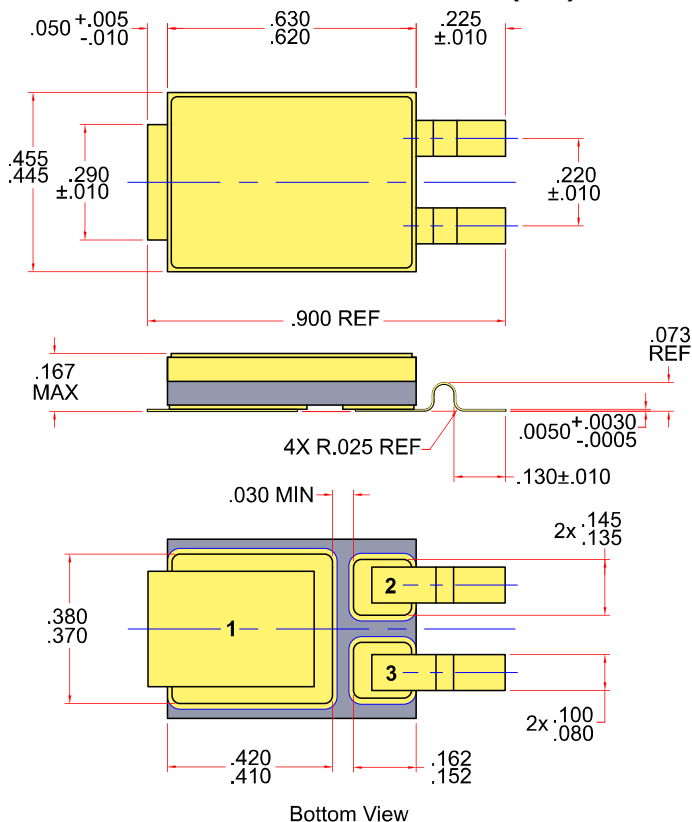
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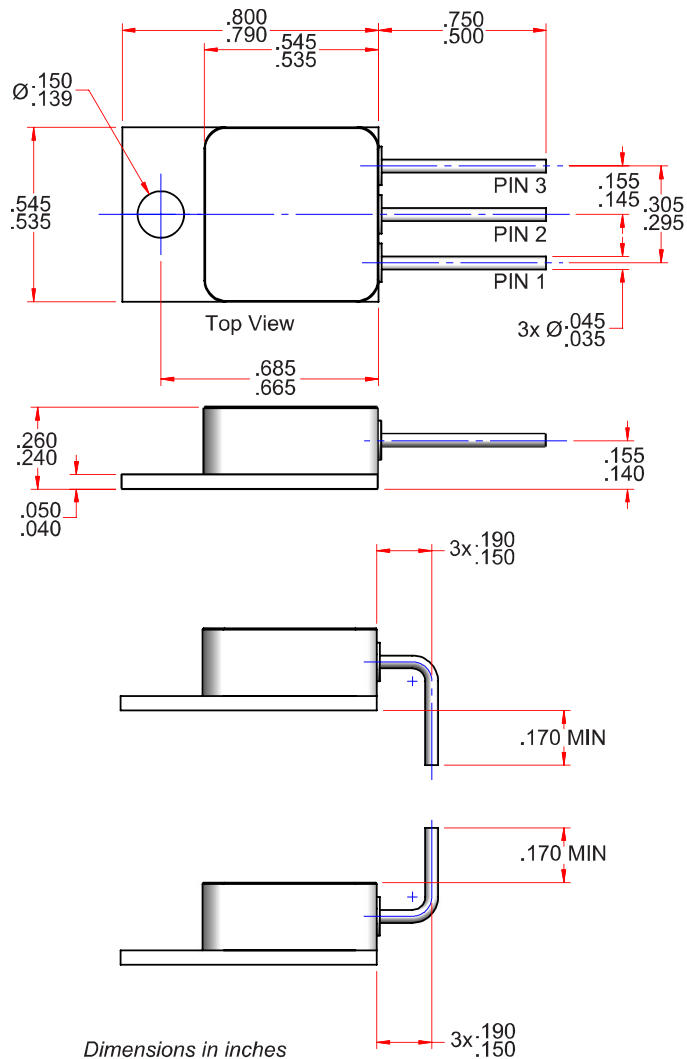
PACKAGE OUTLINE: SMD1 (S1)



PACKAGE OUTLINE: SMD1 with Leads (S1L)



PACKAGE OUTLINE: TO-254 (M)



Pin Assignment:

Package	Drain	Source	Gate
SMD1 (S1)	Pin 1	Pin 2	Pin 3
SMD1 with Leads (S1L)	Pin 1	Pin 2	Pin 3
TO-254 (M)	Pin 1	Pin 2	Pin 3

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