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

SFC85N80S1

85 AMP, 800 VOLTS, 18 mΩ
SiC Power MOSFET
Enhancement Mode N-Channel

DESIGNER'S DATA SHEET

Part Number / Ordering Information [1/]

SFC85N80

Screening[2/]
__ = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

Package
S1 = SMD1
S1L = SMD1 with leads

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
- PFC Boost Converters
- Switch Mode Power Supplies
- Motor Drive
- Aerospace, Hi-Rel, Military

Maximum Ratings[3/]		Symbol	Value	Unit
Drain – Source Voltage		V_{DS}	800	V
Gate – Source Voltage, dynamic[4/]	AC (f > 1 Hz)	V_{GS1}	-8, +19	V
Gate – Source Voltage, static[5/]		V_{GS2}	-4, +15	V
Continuous Drain Current	V_{GS} = 15 V, T_C = 25°C	I_{D1}	85	A
Pulsed Drain Current	Pulse width t_P limited by T_{Jmax}	I_{D2}	250	A
Total Power Dissipation		P_D	156	W
Operating & Storage Temperature		T_{OP} & T_{STG}	-55 to +175	°C
Maximum Thermal Resistance	Junction to Case	$R_{\theta JC}$	0.96 (typ 0.7)	°C/W

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.
4/ When using MOSFET body diode V_{GSmax} = -4 V / +19 V.
5/ MOSFET can also safely operate at V_{GS} = 0 / +15 V.

SMD1 (S1) **SMD1 with Leads (S1L)****

***Customizable ribbon leads option (S1L) reduces risk of vibration stress and thermal fatigue*
****dime used for size reference*

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Electrical Characteristics[3/]		Symbol	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	V_{GS} = 0 V, I_D = 100 µA	$V_{(BR)DSS}$	800	-	-	**V**
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 11 mA V_{DS} = V_{GS}, I_D = 11 mA, T_J = 175°C	$V_{GS(th)}$	1.4 -	2.2 1.8	3.5 -	**V**
Zero Gate Voltage Drain Current	V_{DS} = 800 V, V_{GS} = 0 V	I_{DSS1}	-	3	100	**µA**
Gate - Source Leakage	V_{GS} = 15 V, V_{DS} = 0 V	I_{GSS}	-	30	150	**nA**
Drain - Source On-State Resistance*	V_{GS} = 15 V, I_D = 50 A V_{GS} = 15 V, I_D = 50 A, T_J = 175°C	$R_{DS(on)}$	- -	15 21	18 -	**mΩ**
Forward Transconductance*	V_{DS} = 20 V, I_{DS} = 50 A V_{DS} = 20 V, I_{DS} = 50 A, T_J = 175°C	g_{fs}	- -	14 18	- -	**S**
Input Capacitance **Output Capacitance** **Reverse Transfer Capacitance**	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz, V_{AC} = 25 mV	C_{iss} C_{oss} C_{rss}	- - -	6 0.8 0.04	- - -	**nF**
Turn On Delay Time **Rise Time** **Turn Off Delay Time** **Fall Time**	V_{DD} = 400 V, V_{GS} = 0 V / 15 V, I_D = 35 A, $R_{G(ext)}$ = 1 Ω	$t_{d(on)}$ t_r $t_{d(off)}$ t_f	- - - -	60 190 130 30	- - - -	**ns**
Internal Gate Resistance	V_{AC} = 25 mV, f = 1 MHz	$R_{G(Int)}$	-	4	-	**Ω**
Gate to Source Charge **Gate to Drain Charge** **Total Gate Charge**	V_{DS} = 400 V, V_{GS} = -4 V / 15 V I_D = 35 A	Q_{gs} Q_{gd} Q_g	- - -	64 58 205	- - -	**nC**
Reverse Diode Characteristics[3/]		**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Diode Forward Voltage*	V_{GS} = -4 V, I_{SD} = 50 A V_{GS} = -4 V, I_{SD} = 50 A, T_J = 175°C	V_{SD}	- -	2.1 2.1	- -	**V**
Reverse Recovery Time	V_{GS} = 0 V, I_{SD} = 10 A, V_R = 30 V, di/dt = 100 A/µs, T_J = 25°C	t_{rr}	-	67	-	**ns**
Reverse Recovery Charge		Q_{rr}	-	130	-	**nC**
Peak Reverse Recovery Current		I_{rrm}	-	3.9	-	**A**

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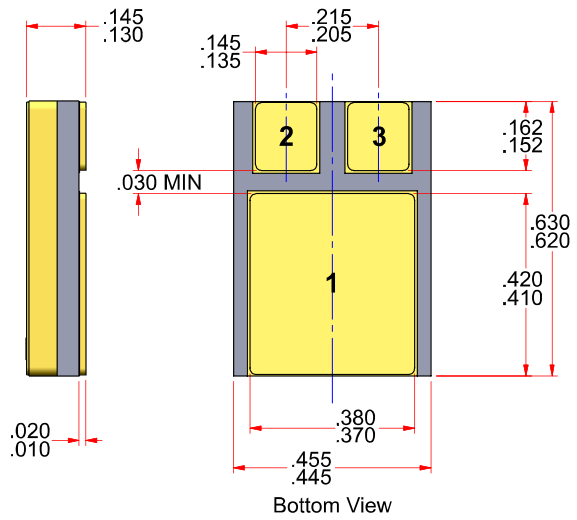
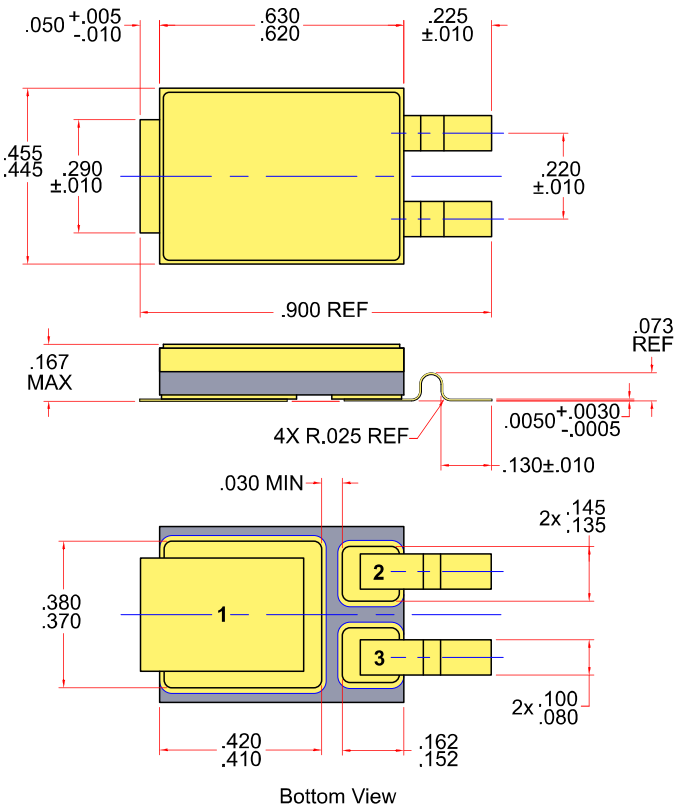
PACKAGE OUTLINE: SMD1 (S1)



Bottom View

Pin Assignment:			
Package	**Drain**	**Source**	**Gate**
SMD1 (S1)	**Pin 1**	**Pin 2**	**Pin 3**
SMD1 with Leads (S1L)	**Pin 1**	**Pin 2**	**Pin 3**

PACKAGE OUTLINE: SMD1 with Leads (S1L)



Bottom View