



Solid State Devices, Inc.

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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

SFC85N80

85 AMP, 800 VOLTS, 18 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
- PFC Boost Converters
- Switch Mode Power Supplies
- Motor Drive
- Aerospace, Hi-Rel, Military

Maximum Ratings ^{3/}	Symbol	Value	Unit
Drain – Source Voltage $V_{GS} = 0\text{ V}, V_{GS} = 250\text{ }\mu\text{A}$	V_{DS}	800	V
Gate – Source Voltage, dynamic ^{4/} AC ($f > 1\text{ Hz}$)	V_{GS1}	-8, +19	V
Gate – Source Voltage, static ^{5/}	V_{GS2}	-4, +15	V
Continuous Drain Current ^{6/} $V_{GS} = 15\text{ V}, T_C = 25^\circ\text{C}$	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	$T_{OP} \text{ \& } T_{STG}$	-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 $V_{GSmax} = -4\text{ V} / +19\text{ V}$.

^{5/} MOSFET can also safely operate at $V_{GS} = 0 / +15\text{ V}$.

SMD1 (S1)

SMD1 with Leads (S1L)**



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

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

DATA SHEET #: FT0112A

DOCX



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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	V _{GS} = 0 V, V _{DS} = 50 V, f = 1 MHz, V _{AC} = 25 mV	C _{iss}	-	6	-	nF
Output Capacitance		C _{oss}	-	0.8	-	
Reverse Transfer Capacitance		C _{rss}	-	0.04	-	
Turn On Delay Time	V _{DD} = 400 V, V _{GS} = 0 V / 15 V, I _D = 35 A, R _{G(ext)} = 1 Ω	t _{d(on)}	-	60	-	ns
Rise Time		t _r	-	190	-	
Turn Off Delay Time		t _{d(off)}	-	130	-	
Fall Time		t _f	-	30	-	
Internal Gate Resistance V _{AC} = 25 mV, f = 1 MHz		R _{G(Int)}	-	4	-	Ω
Gate to Source Charge	V _{DS} = 400 V, V _{GS} = -4 V / 15 V I _D = 35 A	Q _{gs}	-	64	-	nC
Gate to Drain Charge		Q _{gd}	-	58	-	
Total Gate Charge		Q _g	-	205	-	
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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^{4/} When using MOSFET body diode $V_{GSmax} = -4 \text{ V} / +19 \text{ V}$.

^{5/} MOSFET can also safely operate at $V_{GS} = 0 / +15 \text{ V}$.

