



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/}

SFC85N80

Screening ^{2/}

— = Not Screened

TX = TX Level

TXV = TXV Level

S = S Level

Package

S2 = SMD2

SFC85N80

85 AMP, 800 VOLTS, 10 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/}

Drain – Source Voltage

Symbol

Value

Unit

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 ^{6/}

$V_{GS} = 15$ V, $T_C = 25^\circ\text{C}$

I_{D1}

85

A

Pulsed Drain Current

Pulse width t_p limited by T_{Jmax}

I_{D2}

450

A

Total Power Dissipation

P_D

326

W

Operating & Storage Temperature

T_{OP} & T_{STG}

-55 to +175

$^\circ\text{C}$

Maximum Thermal Resistance

Junction to Case

$R_{\theta JC}$

0.46 (typ 0.34)

$^\circ\text{C/W}$

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 $^\circ\text{C}$.

^{4/} When using MOSFET body diode $V_{GSmax} = -4$ V / +19 V.

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

^{6/} Package limited; die is rated at 190 A.

SMD2 (S2)



**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 #: FT0105A

DOCX



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

SFC85N80

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 = 33 mA V _{DS} = V _{GS} , I _D = 33 mA, T _J = 175°C		V _{GS(th)}	1.4 -	2.8 2.1	3.5 -	V
Zero Gate Voltage Drain Current V _{DS} = 800 V, V _{GS} = 0 V		I _{DSS1}	-	6	100	μA
Gate - Source Leakage V _{GS} = 15 V, V _{DS} = 0 V		I _{GSS}	-	16	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 = 175°C		R _{DS(on)}	- -	8.7 12	10 -	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}	- -	87 71	- -	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}	- - -	12 1.4 .02	- - -	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	- - - -	70 100 180 50	- - - -	ns
Internal Gate Resistance V _{AC} = 25 mV, f = 1 MHz		R _{G(Int)}	-	2	-	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	- - -	80 40 270	- - -	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}	- -	4.6 4.1	- -	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}	-	80	-	ns
Reverse Recovery Charge		Q _{rr}	-	136	-	nC
Peak Reverse Recovery Current		I _{rrm}	-	3.4	-	A

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 $V_{GS} = 0 / +15\text{ V}$.

6/ Package limited; die is rated at 190 A.

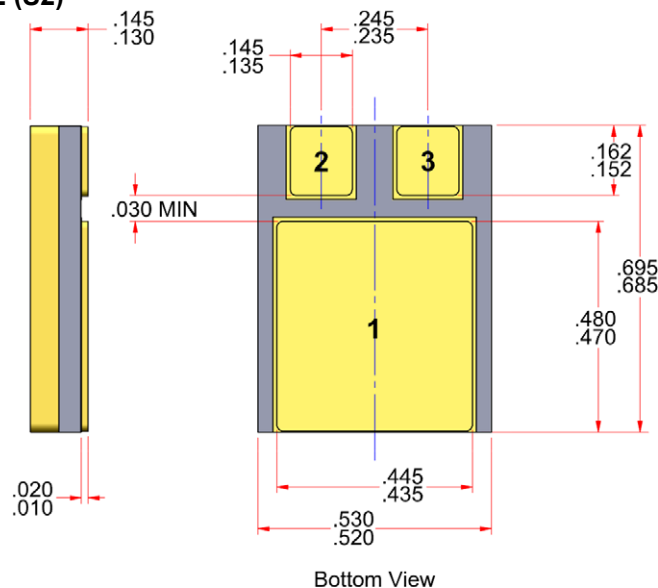
NOTE: All specifications are subject to change without notification.
SCD's for these devices should be reviewed by SSDI prior to release.

DATA SHEET #: FT0105A

DOCX

SFC85N80

PACKAGE OUTLINE: SMD2 (S2)



Pin Assignment:

Package	Drain	Source	Gate
SMD2 (S2)	Pin 1	Pin 2	Pin 3