PRELIMINARY

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

SGF48N10

48 AMP
GaN POWER FET
Enhancement Mode
100 VOLTS, 6 mΩ

Designer's Data Sheet

Part Number/Ordering Information[1/]

SGF48N10 __ __

Screening
__ = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

Package
__ = SMG.3-1

FEATURES:
- 4th Generation Gallium Nitride Technology
- Exceptionally Low $R_{DS(ON)}$
- Low Q_G Simplifies Gate Drive Circuit
- Very Fast Switching for High-Freq. Applications
- Low Thermal Resistance
- Hermetically Sealed, Chip-Scale Package (SMG.3-1)
- TX, TXV, and S-Level Screening Available[2/]

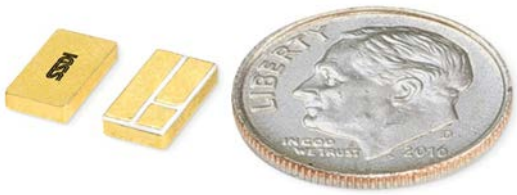
APPLICATIONS:
- High Efficiency DC-DC / PoL Converters
- Motor Controller
- Robotics/Automation
- Military and Aerospace

BENEFITS:
- GaN Transistor offers superior advantages over Si based MOSFET: zero Q_{RR}, low gate charge, low $R_{DS(ON)}$, fast switching speed and low temperature coefficient
- Benefits circuit designer through higher efficiency, lower cross-over losses and On-state losses
- Eliminates the need to add free-wheeling diode

Maximum Ratings[3/]	Symbol	Value	Units
Continuous Drain - Source Voltage	V_{DSS}	100	V
Gate – Source Voltage	V_{GS}	+6 -4	V
Continuous Drain Current	I_{D1}	48	A
Pulsed Drain Current T_{op} / P_{width} limited	I_{D2}	340	A
Total Power Dissipation	P_D	25	W
Operating & Storage Temperature	T_{OP} & T_{STG}	-55 to +150	°C
Thermal Resistance Junction to Case	$R_{\theta JC}$	5	°C/W

NOTES:
1/ For ordering information, price, operating curves, 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/ Pulse Test, P_W = 300 µs, D.C. = 2%.
5/ Attach device with low temperature solder such as Sn63 with peak reflow temperature of 215°C and maximum dwell time of 30 sec.

SMG.3-1 (__)



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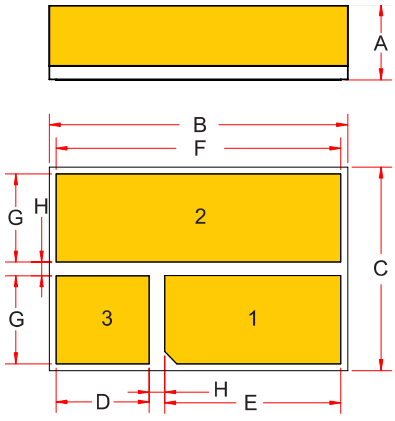
Electrical Characteristics[3]		Symbol	Min	Typ	Max	Units
Drain to Source Breakdown Voltage V_{GS} = 0 V, I_D = 0.8 mA		BV_{DSS}	100	-	-	V
Gate to Source Leakage	V_{GS} = +5 V V_{GS} = -4 V	I_{GSS}	- -	1 0.1	9 0.6	mA
Zero Gate Voltage Drain Current V_{DS} = 80 V, V_{GS} = 0 V, T_J = 25°C		I_{DSS}	-	0.1	0.6	mA
Gate Threshold Voltage V_{DS} = V_{GS}, I_D = 11 mA, T_J = 25°C		$V_{GS(th)}$	0.8	1.4	2.5	V
Drain to Source On State Resistance[4] V_{GS} = 5 V, I_D = 30 A, T_J = 25°C		$R_{DS(on)}$	-	5.5	6	mΩ
Source to Drain Forward Voltage[4] I_F = 0.5 A, V_{GS} = 0 V		V_{SD}	-	1.8	-	V
Total Gate Charge V_{GS} = 5 V, V_{DS} = 50 V, I_D = 30 A		Q_G	-	12	15	nC
Gate to Source Charge **Gate to Drain Charge** **Gate Threshold Charge**	V_{DS} = 50 V I_D = 30 A	Q_{GS} Q_{GD} Q_{GTH}	- - -	3.1 2 2.3	10 4 4.6	nC
Input Capacitance **Output Capacitance** **Reverse Transfer Capacitance**	V_{GS} = 0 V V_{DS} = 50 V f = 1 MHz	C_{ISS} C_{OSS} C_{RSS}	- - -	1270 800 14	1530 1200 -	pF
Output Charge V_{GS} = 0 V, V_{DS} = 50 V		Q_{OSS}	-	66	100	nC
Source to Drain Recovery Charge		Q_{RR}	-	0	-	µC
Gate Resistance		R_G	-	0.4	-	Ω

Case Outline: SMG.3-1 (__)



Available Part Numbers:
SMG.3-1: SGF48N10

Pin Assignment
Source: 2
Drain: 1
Gate: 3
Substrate: internally tied to Source

Dimensions (in inches)		
DIM	MIN	MAX
A	--	.085
B	.315	.345
C	.165	.190
D	.084	.100
E	.204	.220
F	.312	.328
G	.067	.083
H	(.015)	

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