



PRELIMINARY

Solid State Devices, Inc.

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Designer's Data Sheet

Part Number/Ordering Information^{1/}

SGF48N20

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

Package

___ = SMG.3-1

SGF48N20

**48 AMP
GaN POWER FET
Enhancement Mode
200 VOLTS, 11 mΩ**

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 Packages - Available in 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:

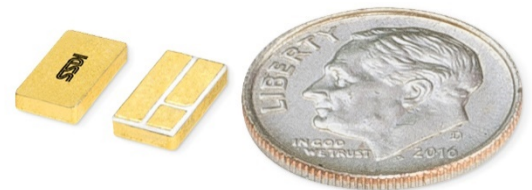
- GaN Transistor offers superior advantages over Si based MOSFET: Zero Q_{RR}, low gate charge, low R_{DS(ON)}, fast switching speed and low temperature coefficient
- Benefits circuit designer through higher efficiency, lower cross-over losses and On-state losses
- Eliminates the need to add free-wheeling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

Maximum Ratings ^{3/}	Symbol	Value	Units
Continuous Drain - Source Voltage	V _{DSS}	200	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}	200	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 _{θJC}	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



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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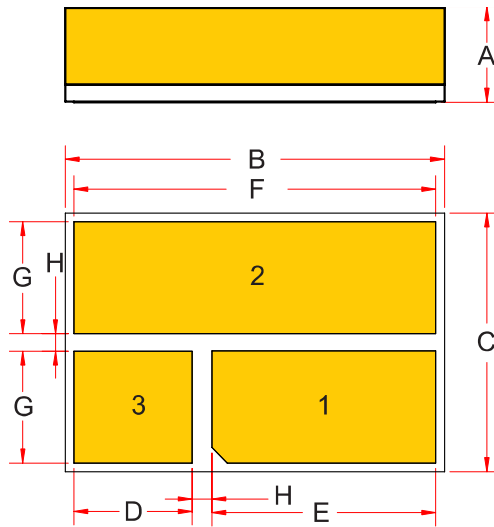
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Electrical Characteristics ^{3/}		Symbol	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 0.6\text{ mA}$	BV_{DSS}	200	-	-	V
Gate to Source Leakage	$V_{GS} = +5\text{ V}$ $V_{GS} = -4\text{ V}$	I_{GSS}	-	1 0.1	7 0.4	mA
Zero Gate Voltage Drain Current	$V_{DS} = 160\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	0.1	0.4	mA
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 7\text{ mA}$	$V_{GS(TH)}$	0.8	1.4	2.5	V
Drain to Source On State Resistance ^{4/}	$V_{GS} = 5\text{ V}, I_D = 20\text{ A}$	$R_{DS(ON)}$	-	8	11	mΩ
Source to Drain Forward Voltage ^{4/}	$I_F = 0.5\text{ A}, V_{GS} = 0\text{ V}$	V_{SD}	-	1.8	-	V
Total Gate Charge	$V_{GS} = 5\text{ V}, V_{DS} = 100\text{ V}, I_D = 20\text{ A}$	Q_G	-	12	15	nC
Gate to Source Charge	$V_{DS} = 100\text{ V}$ $I_D = 20\text{ A}$	Q_{GS}	-	3	-	nC
Gate to Drain Charge		Q_{GD}	-	1.8	-	
Gate Threshold Charge		Q_{GTH}	-	2.2	-	
Input Capacitance	$V_{GS} = 0\text{ V}$	C_{ISS}	-	950	1140	pF
Output Capacitance	$V_{DS} = 100\text{ V}$	C_{OSS}	-	450	680	
Reverse Transfer Capacitance	$f = 1\text{ MHz}$	C_{RSS}	-	2.3	-	
Output Charge	$V_{GS} = 0\text{ V}, V_{DS} = 100\text{ V}$	Q_{OSS}	-	75	113	nC
Source to Drain Recovery Charge		Q_{RR}	-	0	-	μC
Gate Resistance		R_G	-	0.5	-	Ω

SMG.3-1 ()



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)	

Dimensions in inches

PIN ASSIGNMENT

Source: 2
 Drain: 1
 Gate: 3
 Substrate: *
 *Substrate internally tied to Source

AVAILABLE PART NUMBERS:

SMG.3-1: SGF48N20

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