Solid State Devices, Inc.
14701 Firestone Blvd * La Mirada, Ca 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
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SGF48N10M
SGF48N10S1

48 AMP
GaN POWER FET
Enhancement Mode
100 VOLTS, 8 – 10 mΩ

Designer's Data Sheet

Part Number/Ordering Information[1/]

SGF48N10 ___ ___ ___

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

Lead Bend Options
(TO-254 only)
__ = Straight Leads
UB = Up Bend
DB = Down Bend

Package
M = TO-254
S1= SMD1

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 Package
- Available in 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.

SMD1 (S1) **TO-254 (M)**

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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	SMD1 (S1) TO-254 (M)	**$R_{DS(on)}$**	- -	- -	8 10	**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**

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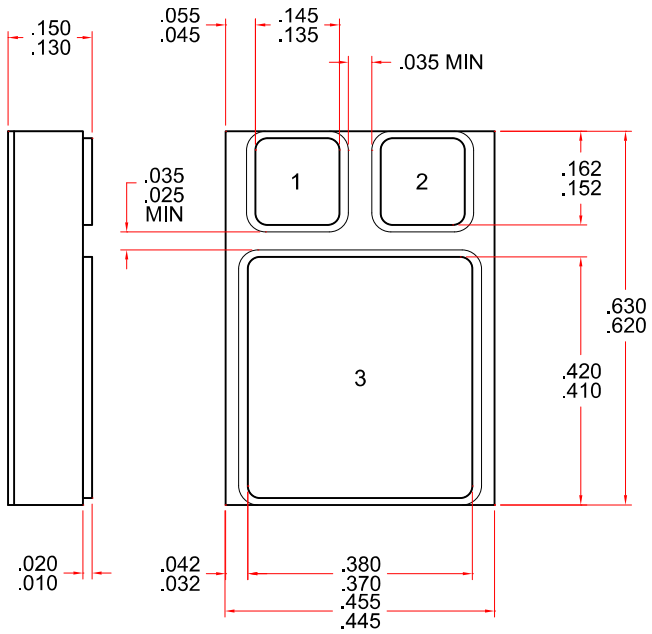
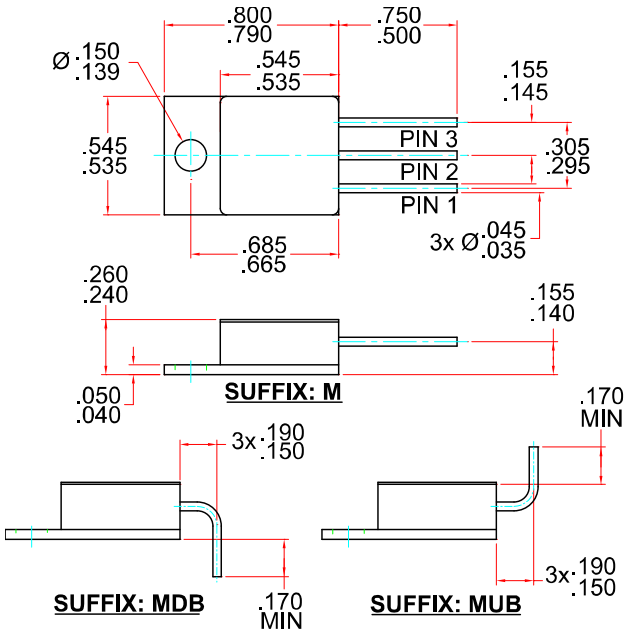
Package Outlines:

SMD1 (S1)



TO-254 (M)



AVAILABLE PART NUMBERS:
SMD1: SGF48N10S1
TO-254: SGF48N10M, SGF48N10MDB, SGF48N10MUB

Dimensions in inches

PIN ASSIGNMENT

	SMD1	TO-254
Source	3	2
Drain	2	1
Gate	1	3
Substrate	*	*

* Substrate internally tied to Source