



# 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

# SSG55N60 series

## DESIGNER'S DATA SHEET

### Part Number/Ordering Information <sup>1/</sup>

SSG55N60

### Screening <sup>2/</sup>

- = Not Screened
- TX = TX Level
- TXV = TXV
- S = S Level

### Package Type

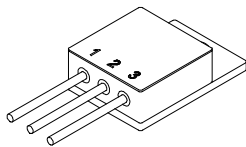
- M = TO-254
- Z = TO-254Z
- N = TO-258
- P = TO-259
- /3 = TO-3

## 55 AMP /600 Volts 1.65 V saturation ultrafast IGBT

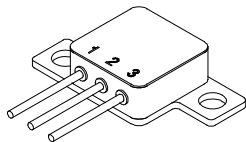
- Features:**
- Lowest ON-resistance in the industry
  - Hermetically Sealed, Isolated Package
  - Low Total Gate Charge
  - Fast Switching
  - TX, TXV, S-Level screening available

Maximum Ratings	Symbol	Value	Units
Collector – Emitter Breakdown Voltage	$V_{CES}$	600	V
Gate – Emitter Voltage	$V_{GE}$	±20	V
Max. Continuous Collector Current	$I_{D1}$ $I_{D2}$	55 27	A
		@ $T_C = 25^\circ C$ @ $T_C = 100^\circ C$	
Max. Instantaneous Drain Current (Tj limited)	$I_{D3}$	200	A
		@ $T_C = 25^\circ C$	
Clamped Inductive Load current	$I_{LM}$	200	A
		L= 10 uH	
Repetitive Reverse Voltage Avalanche Energy	$E_{ARV}$	20	mJ
		Limited by Tj max	
Total Power Dissipation	$P_D$	195	W
		@ $T_C = 25^\circ C$	
Operating & Storage Temperature	$T_{OP}$ & $T_{STG}$	-55 to +150	°C
Maximum Thermal Resistance (Junction to Case)	$R_{\theta JC}$	0.64 (typ 0.35)	°C/W

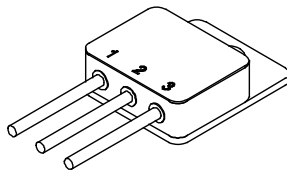
TO-254 (M)



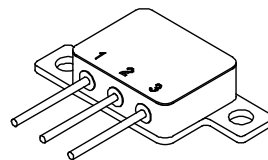
TO-254Z (Z)



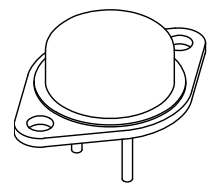
TO-258 (N)



TO-259 (P)



TO-3 (/3)



**NOTES:** \*Pulse Test: Pulse Width = 300µsec, Duty Cycle = 2%.

<sup>1/</sup> For ordering information, price, and availability - contact factory.

<sup>2/</sup> Screening based on MIL-PRF-19500. Screening flows available on request.

<sup>3/</sup> Unless otherwise specified, all electrical characteristics @25°C.

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

**DATA SHEET #:** TG0005C

**DOC**



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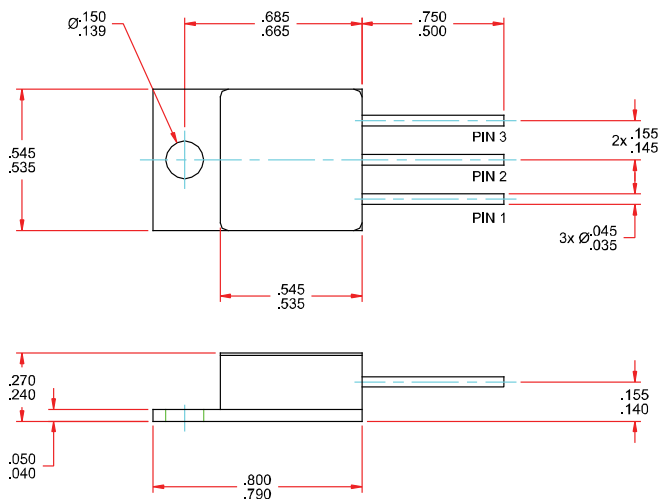
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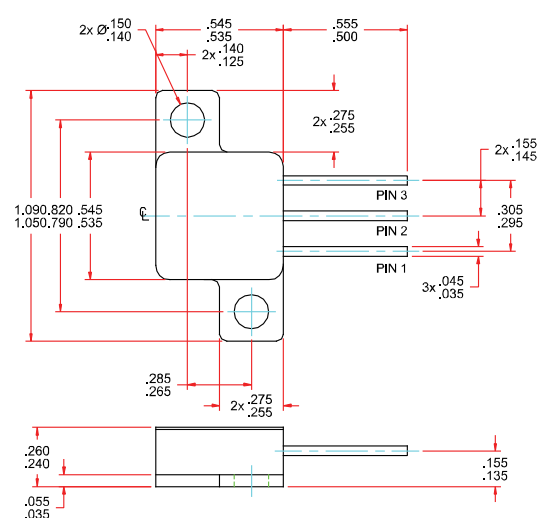
# SSG55N60 series

Electrical Characteristics <sup>3/</sup>		Symbol	Min	Typ	Max	Units
Collector to Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 250\mu A$	$BV_{CES}$	600	—	—	V
Emitter to Collector Breakdown Voltage	$V_{GE} = 0V, I_C = 1 A$	$BV_{ECS}$	18	—	—	V
Collector to Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 27A, T_j = 25^\circ C$	$V_{CE(on)}$	—	1.65	2.0	V
	$V_{GE} = 15V, I_C = 55A, T_j = 25^\circ C$		—	2.0	—	
	$V_{GE} = 15V, I_C = 27A, T_j = 150^\circ C$		—	1.6	—	
Gate Threshold Voltage	$V_{CE} = V_{GE}, I_C = 0.25 mA$	$V_{GS(th)}$	3.0	—	6.0	V
Gate to Emitter Leakage	$V_{GE} = \pm 20V$	$I_{GES}$	—	—	$\pm 100$	nA
Zero Gate Voltage Collector Current	$V_{CE} = 600V, V_{GE} = 0V, T_j = 25^\circ C$	$I_{CES}$	—	0.5	250	$\mu A$
	$V_{CE} = 10V, V_{GE} = 0V, T_j = 25^\circ C$		—	—	2	$\mu A$
	$V_{CE} = 600V, V_{GE} = 0V, T_j = 150^\circ C$		—	—	5000	$\mu A$
Forward Transconductance	$V_{CE} = 15V, I_C = 27A, T_j = 25^\circ C$	$g_{fs}$	15	25	—	Mho
Total Turn-on Gate Charge	$V_{GE} = 15V$	$Q_g$	—	150	275	nC
Gate to Emitter Turn-on Charge	$V_{CC} = 400V$	$Q_{ge}$	—	25	40	
Gate to Collector Turn-on Charge	$I_C = 27A$	$Q_{gc}$	—	60	90	
Turn on Delay Time	$V_{GE} = 15V, V_{CC} = 480V, I_C = 27A, R_G = 5.0\Omega, T_j = 25^\circ C$	$t_{d(on)}$	—	50	70	nsec
Rise Time		$t_r$	—	125	—	
Turn off Delay Time		$t_{d(off)}$	—	250	300	
Fall Time		$t_f$	—	120	150	
Turn-On Switching Losses	$V_{GE} = 15V, V_{CC} = 480V, I_C = 27A, R_G = 5.0\Omega, T_j = 25^\circ C$	$E_{on}$	—	0.12	—	mJ
Turn-Off Switching Losses		$E_{off}$	—	0.55	—	
Total Switching Losses		$E_{ts}$	—	0.66	0.9	
Turn on Delay Time	$V_{GE} = 15V, V_{CC} = 480V, I_C = 27A, R_G = 5.0\Omega, T_j = 150^\circ C$	$t_{d(on)}$	—	90	120	ns
Rise Time		$t_r$	—	600	—	ns
Turn off Delay Time		$t_{d(off)}$	—	230	300	ns
Fall Time		$t_f$	—	1200	—	ns
Total Switching Losses		$E_{ts}$	—	1.6	—	mJ
Input Capacitance	$V_{GE} = 0V$	$C_{ies}$	—	4000	—	pF
Output Capacitance	$V_{CC} = 30V$	$C_{oes}$	—	250	—	
Reverse Transfer Capacitance	$f = 1 MHz$	$C_{res}$	—	20	—	

TO-254 (M)



TO-254Z (Z)



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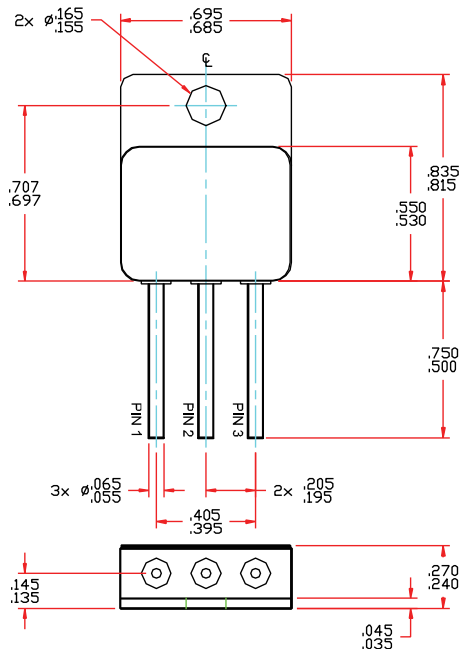
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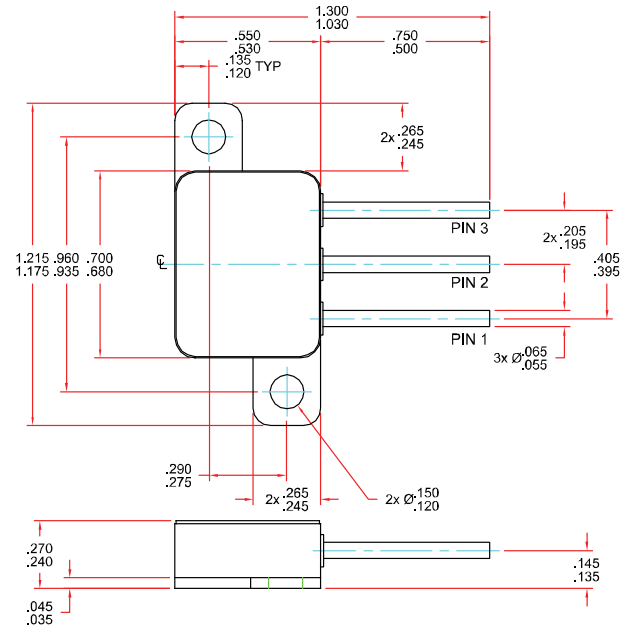
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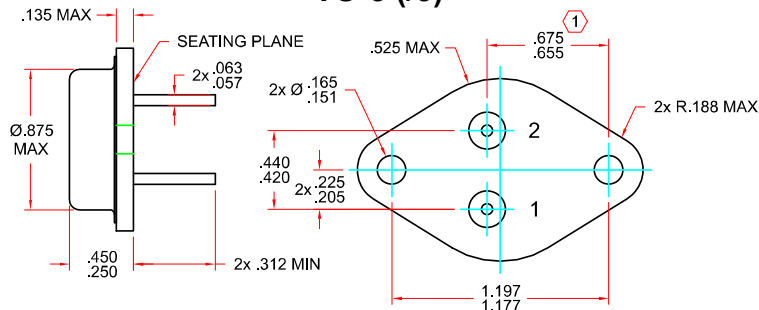
## TO-258 (N)



## TO-259 (P)



## TO-3 (/3)



**NOTES:**

① THIS DIMENSION SHALL BE MEASURED AT POINTS .050 - .055" BELOW THE SEATING PLANE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

### PIN ASSIGNMENT (Standard)

Package	Collector	Emitter	Gate
TO-254 (M)	Pin 1	Pin 2	Pin 3
TO-254Z (Z)	Pin 1	Pin 2	Pin 3
TO-258 (N)	Pin 1	Pin 2	Pin 3
TO-259 (P)	Pin 1	Pin 2	Pin 3
TO-3 (/3)	Case	Pin 2	Pin 1

### Available Part Numbers:

SSG55N60M  
SSG55N60Z  
SSG55N60N  
SSG55N60P  
SSG55N60/3

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