

N-CHANNEL MOS FIELD EFFECT TRANSISTOR**DESCRIPTION**

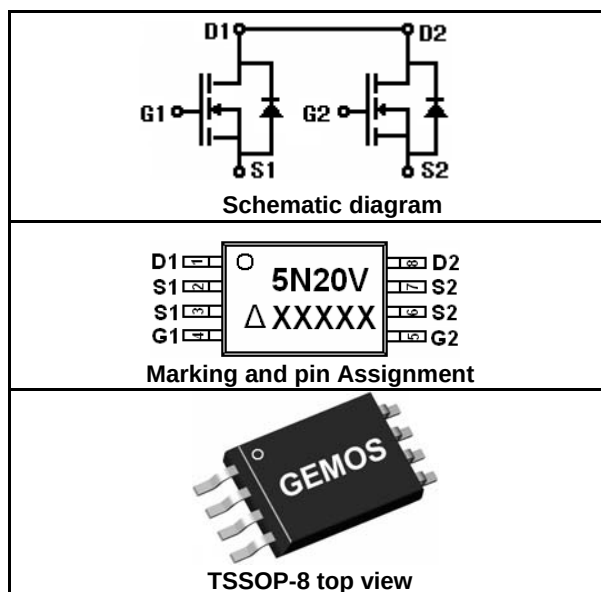
The GE5N20V uses advanced trench technology to provide excellent $R_{DS(ON)}$, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility. This device is suitable for use as a Battery protection or in other Switching application.

GENERAL FEATURES

- $V_{DS} = 20V, I_D = 5A$ $R_{DS(ON)} < 36m\Omega @ V_{GS}=2.7V$
 $R_{DS(ON)} < 27.5m\Omega @ V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

APPLICATIONS

- Battery protection
- Load switch
- Power management

**PACKAGE MARKING AND ORDERING INFORMATION**

Device Marking	Device	Package	Reel Size	Tape width	Quantity
5N20V	GE5N20V	TSSOP-8	Ø330mm	12mm	3000 units

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous @ Current-Pulsed (Note 1)	I_D	5	A
	I_{DM}	20	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	°C/W
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=18V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6			V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=2.5A$		21	27.5	mΩ
		$V_{GS}=2.7V, I_D=2.5A$		26	36	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_D=2.5A$		9.5		S

DYNAMIC CHARACTERISTICS		(Note 4)				
Input Capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V, F=1.0MHz		460		PF
Output Capacitance	C _{oss}			200		PF
Reverse Transfer Capacitance	C _{rss}			50		PF
SWITCHING CHARACTERISTICS		(Note 4)				
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V,I _D =2.5A V _{GS} =4.5V, R _{GEN} =4.7Ω		7		nS
Turn-on Rise Time	t _r			33		nS
Turn-Off Delay Time	t _{d(off)}			27		nS
Turn-Off Fall Time	t _f			10		nS
Total Gate Charge	Q _g	V _{DS} =10V,I _D =4.5A, V _{GS} =4.5V		8.5	11.5	nC
Gate-Source Charge	Q _{gs}			1.8		nC
Gate-Drain Charge	Q _{gd}			2.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	(Note 3)	V _{SD}	V _{GS} =0V,I _S =5A		1.2	V
Diode Forward Current		I _S			5	A

NOTES:

- 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2. When Mounted on minimum recommended footprint.
- 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%.
- 4. Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

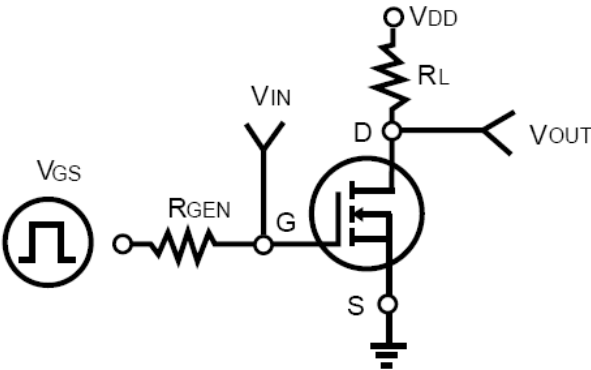


Figure 1: Switching Test Circuit

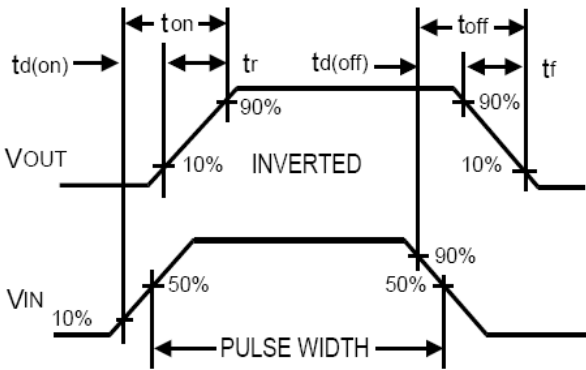


Figure 2: Switching Waveforms

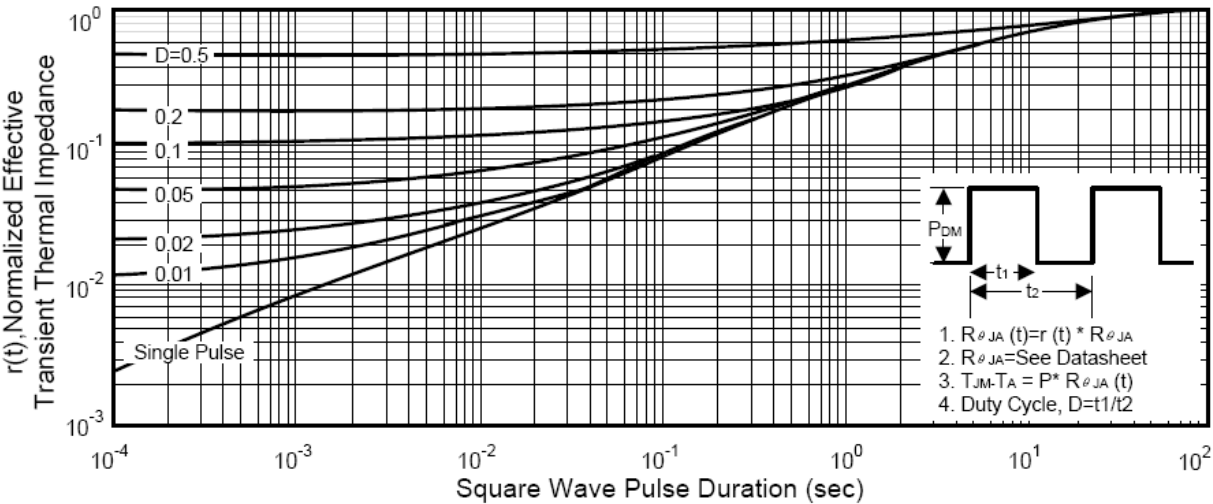
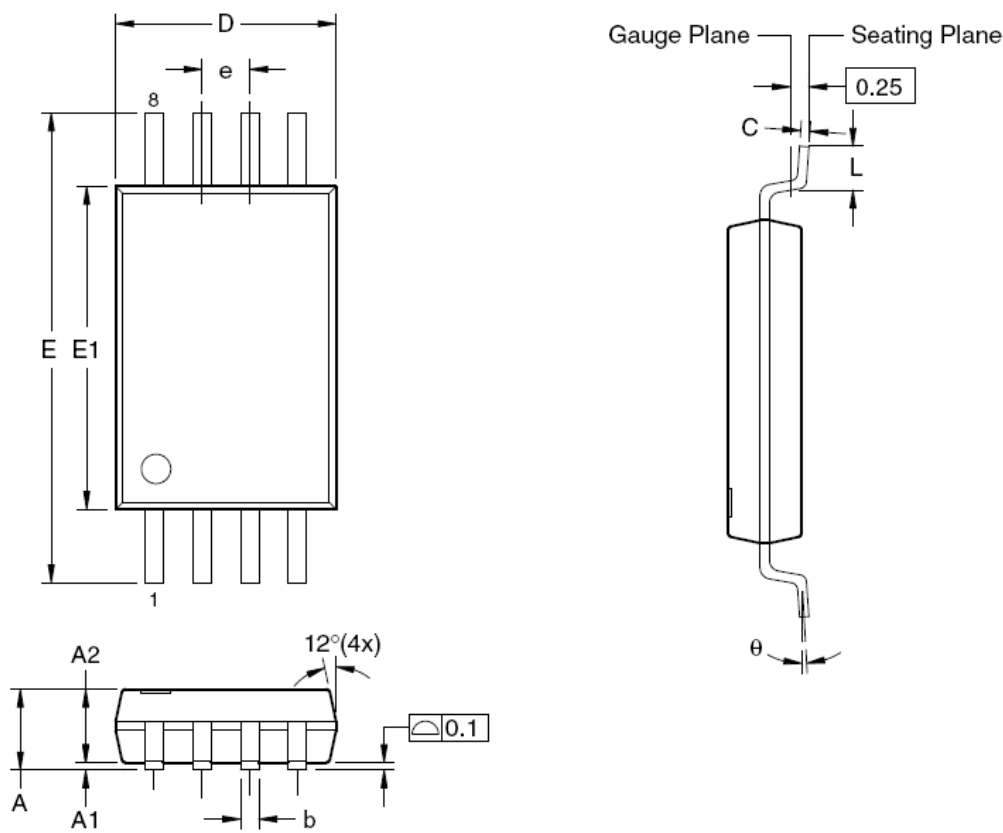


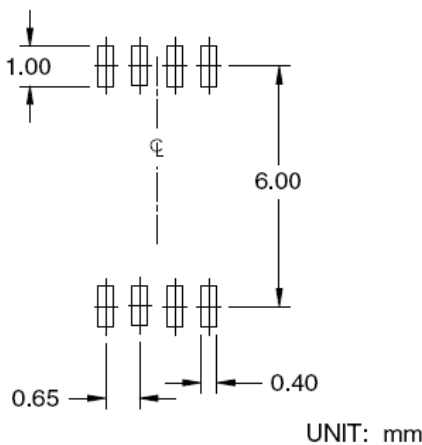
Figure 3: Normalized Maximum Transient Thermal Impedance

TSSOP-8 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.20
A1	0.05	—	0.15
A2	0.80	1.00	1.05
b	0.19	—	0.30
C	0.09	—	0.20
D	2.90	3.00	3.10
E	6.40 BSC		
E1	4.30	4.40	4.50
e	0.65 BSC		
L	0.45	0.60	0.75
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	—	—	0.047
A1	0.002	—	0.006
A2	0.031	0.039	0.041
b	0.007	—	0.012
C	0.004	—	0.008
D	0.114	0.118	0.122
E	0.252 BSC		
E1	0.169	0.173	0.177
e	0.026 BSC		
L	0.018	0.024	0.030
θ	0°	—	8°

NOTES:

- 1. All dimensions are in millimeters.
- 2. Dimensions are inclusive of plating
- 3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
- 4. Dimension L is measured in gauge plane.
- 5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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