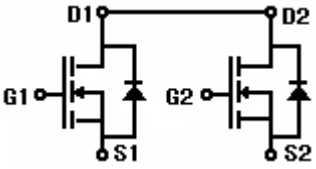
GEMOS

MOS FIELD EFFECT TRANSISTOR
GE5N20V

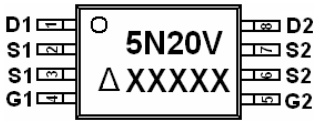
N-CHANNEL MOS FIELD EFFECT TRANSISTOR

DESCRIPTION

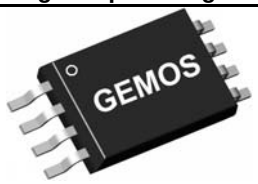
The GE5N20V uses advanced trench technology to provide excellent $R_{DS(ON)}$, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility. This device is suitable for use as a Battery protection or in other Switching application.



Schematic diagram



Marking and pin Assignment



TSSOP-8 top view

GENERAL FEATURES

- V_{DS} = 20V,I_D = 5A $R_{DS(ON)}$ < 36mΩ @ V_{GS}=2.7V
  $R_{DS(ON)}$ < 27.5mΩ @ V_{GS}=4.5V
- High Power and current handing 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 RATLNGS(TA=25℃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	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	℃/W

ELECTRICAL CHARACTERISTICS (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	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}=±12V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	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

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DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C_{lss}	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

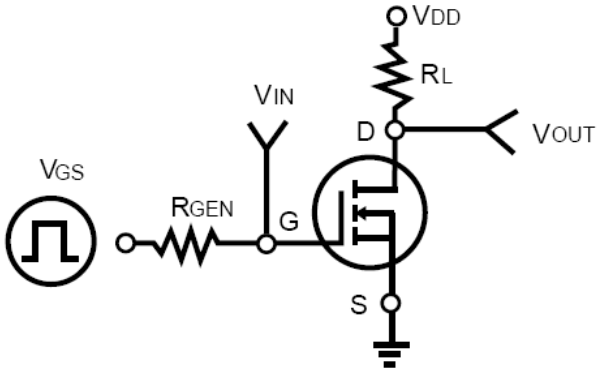


Figure 1: Switching Test Circuit

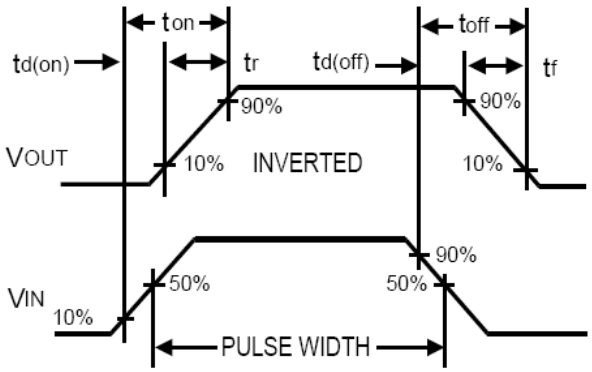


Figure 2: Switching Waveforms

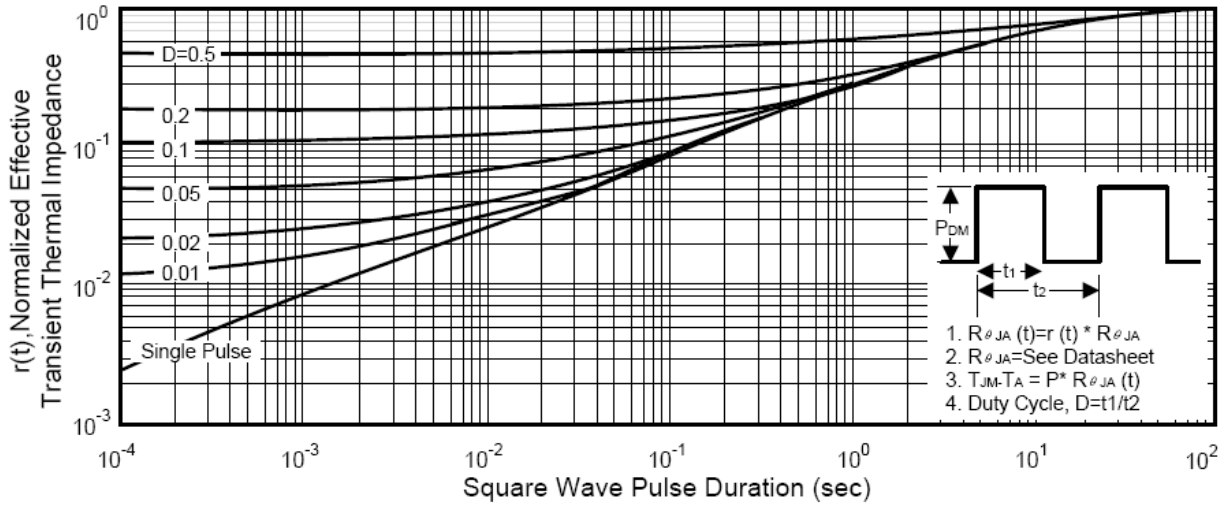
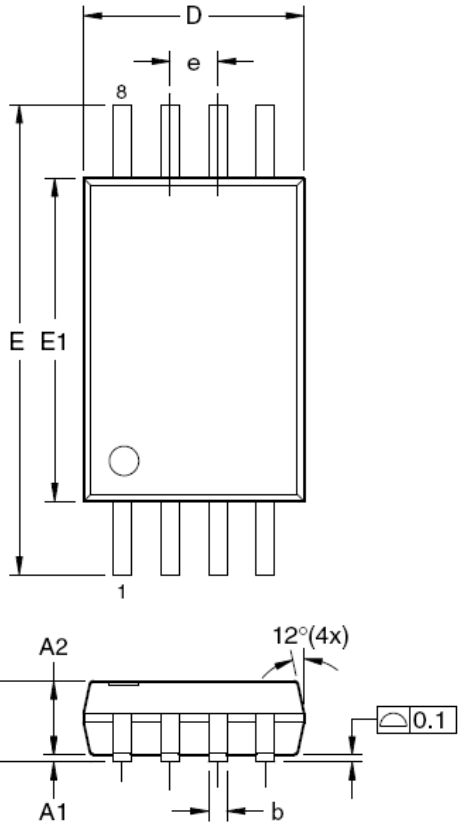
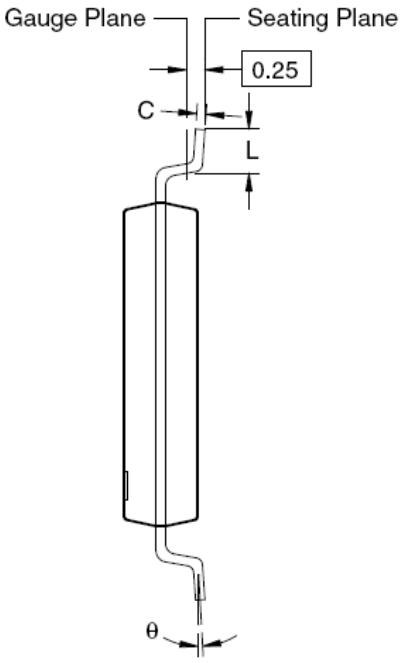


Figure 3: Normalized Maximum Transient Thermal Impedance

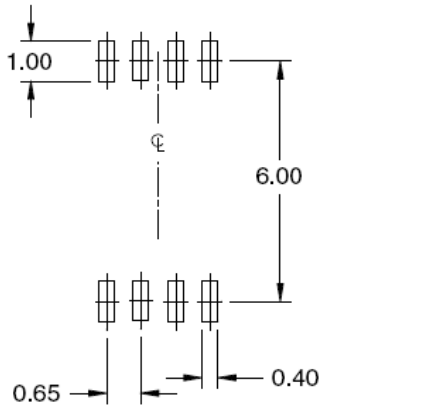
TSSOP-8 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)





RECOMMENDED LAND PATTERN



UNIT: mm

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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