

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

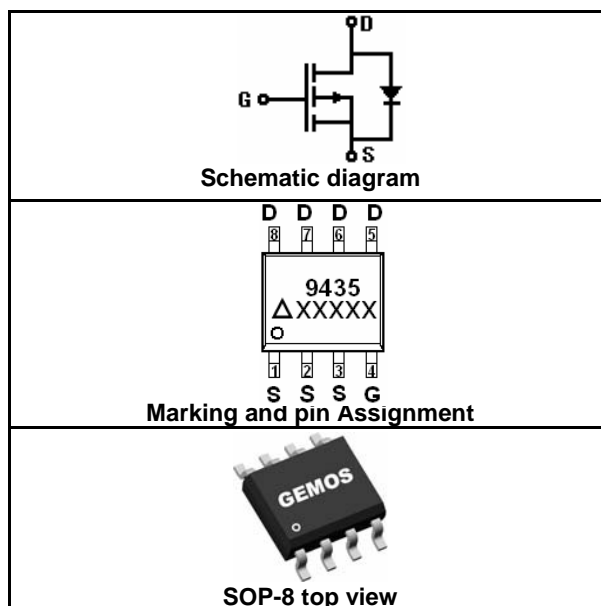
The GE9435 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It has been optimized for power management applications requiring a wide range of gate drive voltage ratings (4.5V – 25V).

GENERAL FEATURES

- $V_{DS} = -30V, I_D = -5.3A$ $R_{DS(ON)} < 90m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)} < 53m\Omega$ @ $V_{GS} = -10V$
- 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
9435	GE9435	SOP-8	Ø330mm	12mm	3000 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous @ Current-Pulsed (Note 1)	I_D	-5.3	A
	I_{DM}	-20	A
Maximum Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	50	°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}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1		-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5.3A$		46	53	$m\Omega$
		$V_{GS}=-4.5V, I_D=-4.2A$		74	90	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=-15V, I_D=-5.3A$	4	7		S

DYNAMIC CHARACTERISTICS			(Note 4)				
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1.0MHz		1040		PF	
Output Capacitance	C _{oss}			420		PF	
Reverse Transfer Capacitance	C _{rss}			150		PF	
SWITCHING CHARACTERISTICS							
(Note 4)							
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, I _D =-1A V _{GS} =-10V, R _{GEN} =6Ω		19	26	nS	
Turn-on Rise Time	t _r			9	13	nS	
Turn-Off Delay Time	t _{d(off)}			74	105	nS	
Turn-Off Fall Time	t _f			36	50	nS	
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-5.3A, V _{GS} =-10V		22.5	29	nC	
Gate-Source Charge	Q _{gs}			2		nC	
Gate-Drain Charge	Q _{gd}			6		nC	
DRAIN-SOURCE DIODE CHARACTERISTICS							
Diode Forward Voltage	(Note 3)	V _{SD}	V _{GS} =0V, I _S =-5.3A			-1.3	V
Diode Forward Current	(Note 2)	I _S				-1.9	A

NOTES:

- 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4. Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

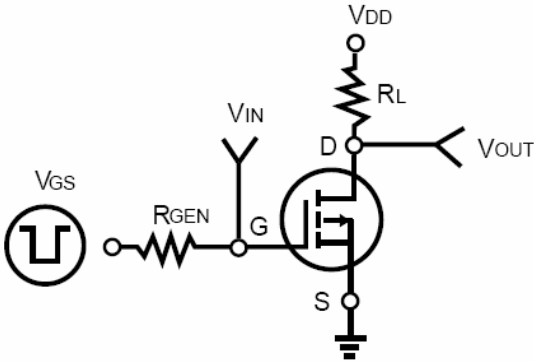


Figure 1: Switching Test Circuit

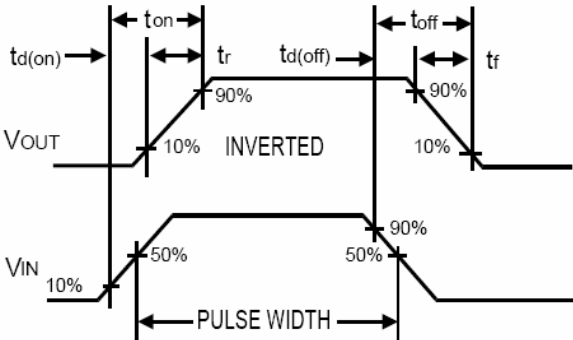


Figure 2: Switching Waveforms

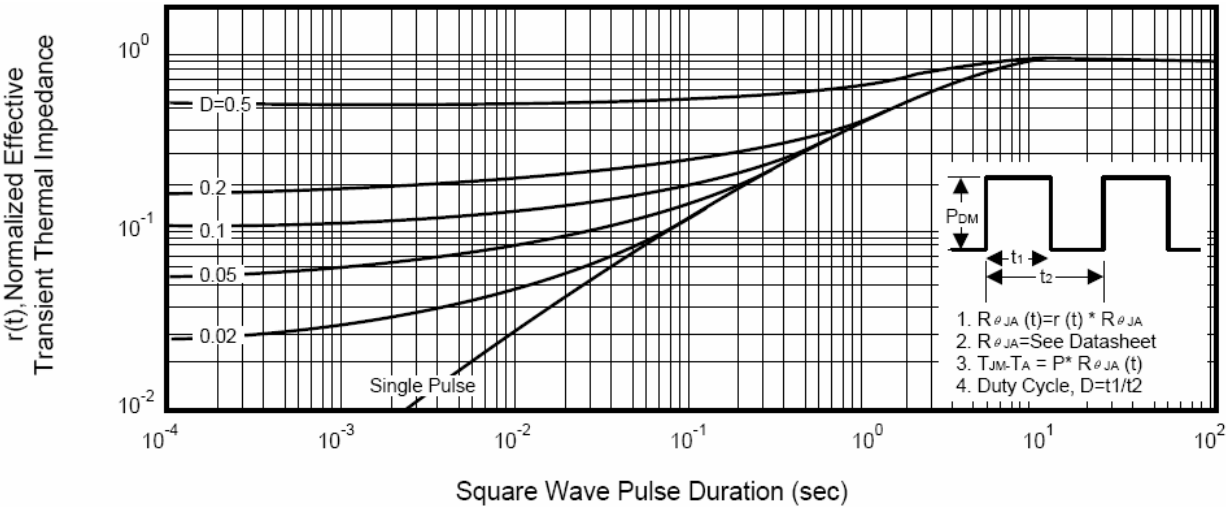
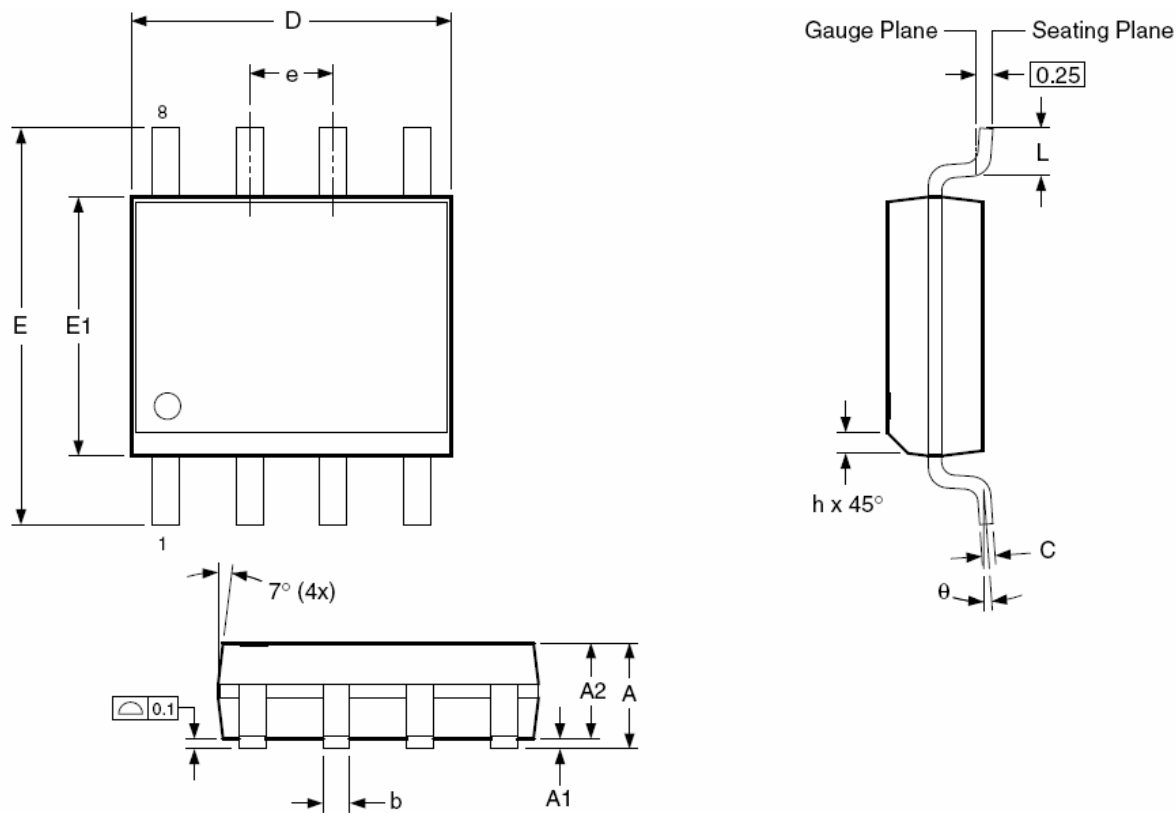


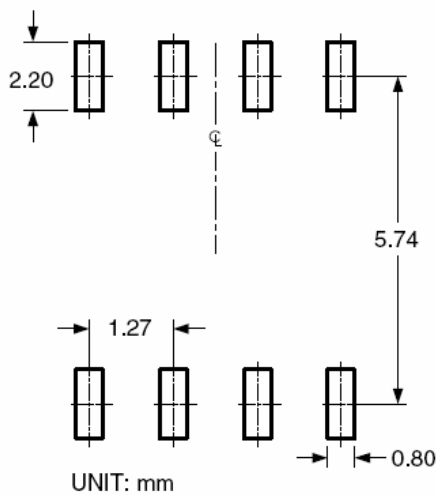
Figure 3: Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	0.228	0.236	0.244
h	0.010	—	0.020
L	0.016	—	0.050
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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