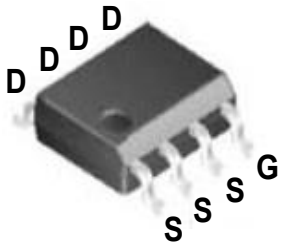
ER3909

P-Channel Enhancement Mode Field Effect Transistor



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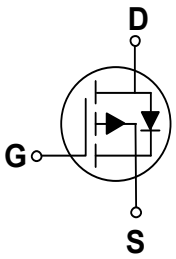

Features

- V_{DS} = -30V / I_D = -7A
- $R_{DS(ON)} \leqq$ 30mΩ @ V_{GS} = -10V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Suit for -4.5V Gate Drive Applications
- Fast switching
- SOP-8 package design

Applications

- Notebook
- Battery Protection
- Load Switch
- Hand-held Instruments

Ordering Information

Part No.	Remark	Package	Packing
ER3909	RoHS Compliant	SOP-8	3000 / Tape & Reel
ER3909-H	Halogen Free		

Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Linits	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-7	A
Pulsed Drain Current	I_{DM}	-30	A
Power Dissipation TA=25°C	P_D	2	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C

Thermal Characteristics

Parameter	Symbol	Max	Unit
Junction-to-Ambient	$R_{\theta JA}$	62	°C/W

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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter		Symbol	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	I_D= -250uA, V_{GS}=0V	$V_{(BR)DSS}$	-30	-	-	V
Gate Threshold Voltage	V_{DS}=$V_{GS,}$ I_D= -250μA	$V_{GS(th)}$	-1	-	-2.5	V
Gate-Body leakage current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	-	-	±100	nA
Zero Gate Voltage Drain Current	V_{DS}= -24V, V_{GS}=0V, T_j=25°C	I_{DSS}	-	-	-1	uA
Forward Transconductance [A]	V_{DS}= -5V, I_D=-7A	g_{fs}	-	10	-	S
Drain-Source On-State Resistance [A]	V_{GS}= -10V, I_D= -4A	$R_{DS(ON)}$	-	-	30	mΩ
	V_{GS}= -4.5V, I_D= -2A		-	-	55	
Dynamic Parameters						
Input Capacitance	V_{GS}=0V, V_{DS}=- 15V, f=1MHz	C_{iss}	-	930	-	pF
Output Capacitance		C_{oss}	-	148	-	
Reverse Transfer Capacitance		C_{rss}	-	115	-	
Total Gate Charge [B]	V_{GS}= -4.5V, V_{DS}= -20V, I_D= -7A	Q_g	-	9.8	-	nC
Gate-Source Charge [B]		Q_{gs}	-	2.2	-	
Gate-Drain Charge [B]		Q_{gd}	-	3.4	-	
Turn-On Delay Time [B]	V_{DS}= -24V, R_G=3.3Ω, V_{GS}= -10V, I_D= -1A	$t_{d(on)}$	-	16.4	-	nS
Turn-On Rise Time [B]		t_r	-	20.2	-	
Turn-Off Delay Time [B]		$t_{d(off)}$	-	55	-	
Turn-Off Fall Time [B]		t_f	-	10	-	
Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	R_g	-	15	-	Ω
Source-Drain Diode Ratings And Characteristics						
Continuous Current	V_G=V_D=0V , Force Current	I_S	-	-	-7	A
Pulsed Current [C]		I_{SM}	-	-	-14	A
Diode Forward Voltage [A]	I_S= -2.3A, V_{GS}=0V	V_{SD}	-	-	-1.2	V

NOTES：

A：Pulse test：Pulse width ≦ 300 usec, Duty Cycle ≦ 2%

B：Independent of operating temperature

C：Pulse width limited by maximum junction temperature

Typical Characteristics

Fig. 1 - Typical Output Characteristics

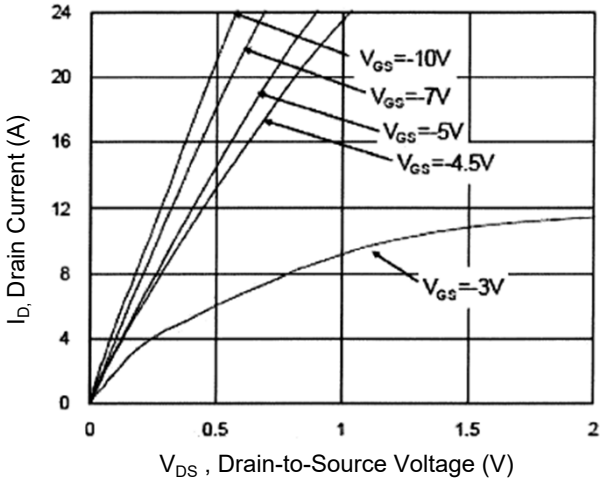


Fig. 2 - Typical Output Characteristics

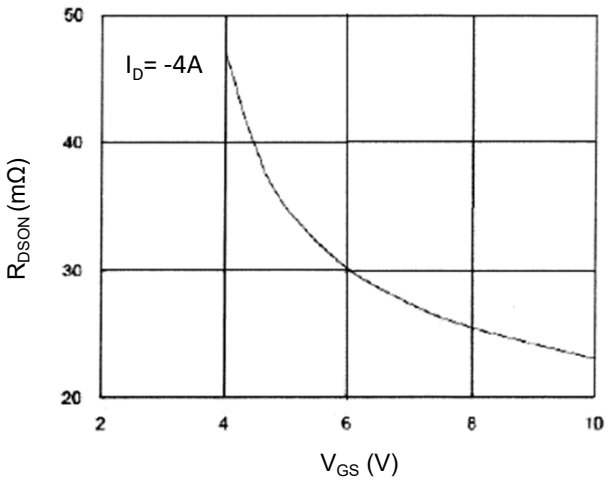


Fig. 3 - Forward Characteristics of Reverse

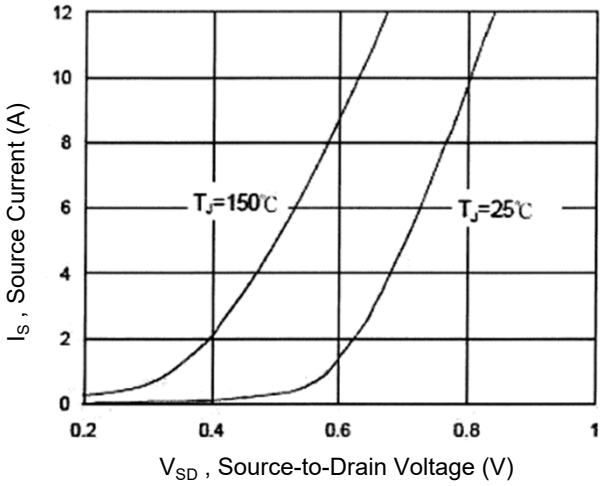


Fig. 4 - Gate-Charge Characteristics

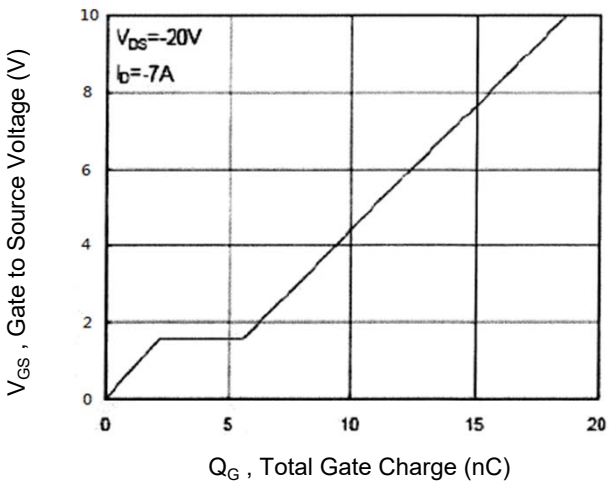


Fig. 5 - Normalized $V_{GS(th)}$ v.s T_J

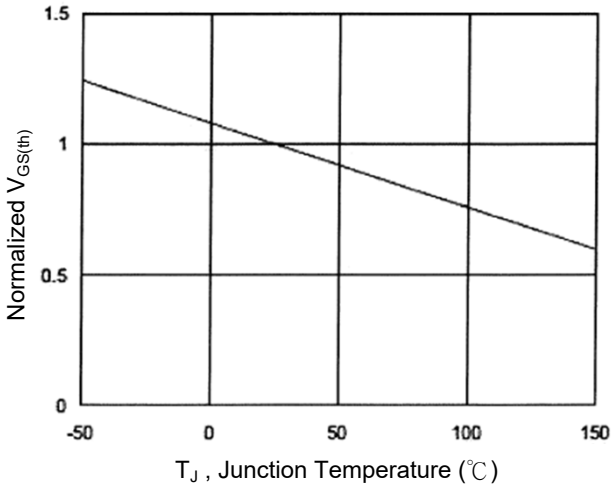
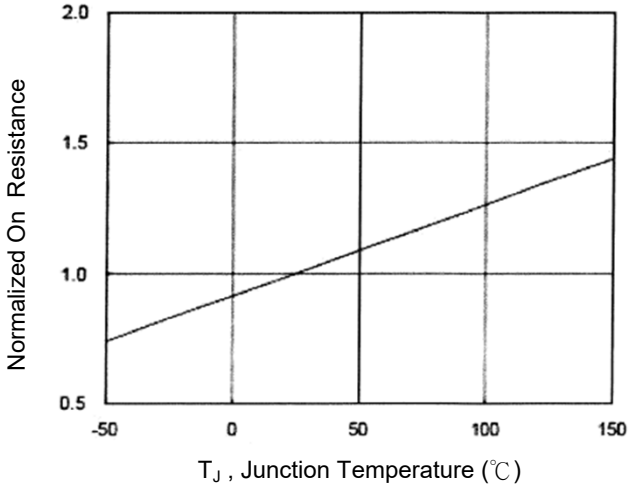


Fig. 6 - Normalized R_{DSON} v.s T_J



Typical Characteristics

Fig. 7 - Capacitance

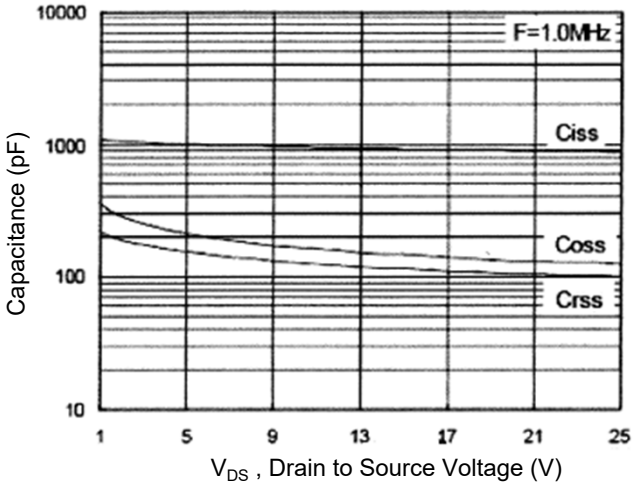


Fig. 8 - Safe Operating Area

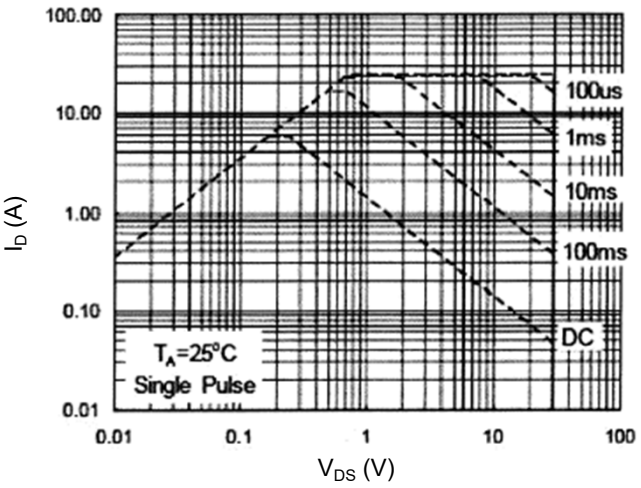


Fig. 9 - Normalized Maximum Transient Thermal Impedance

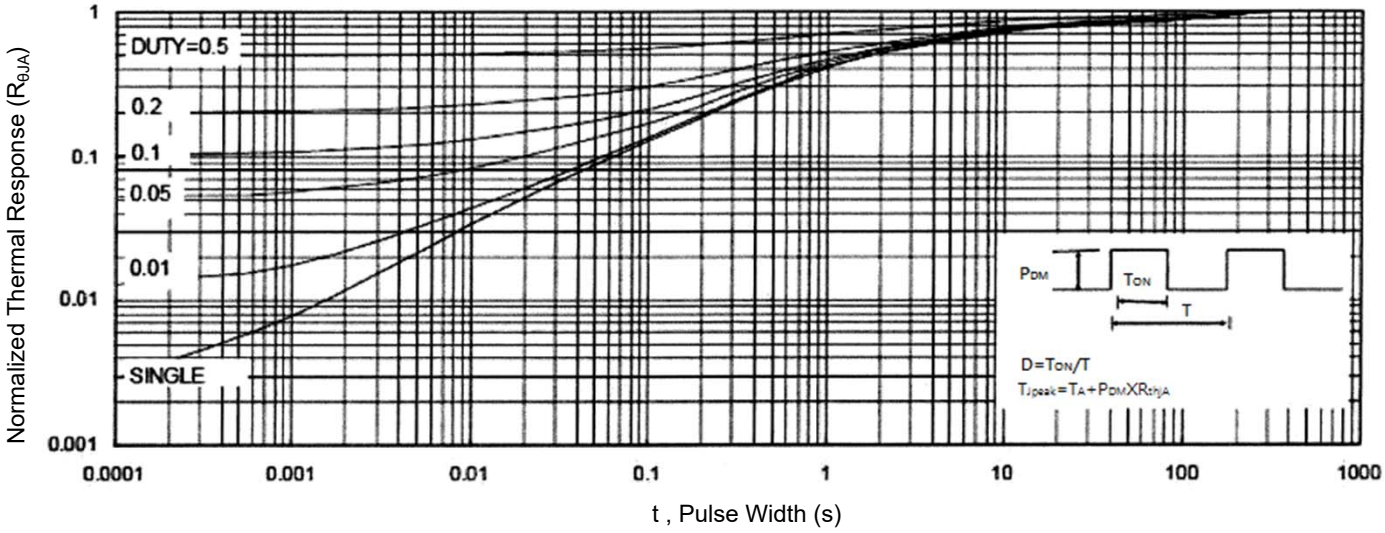
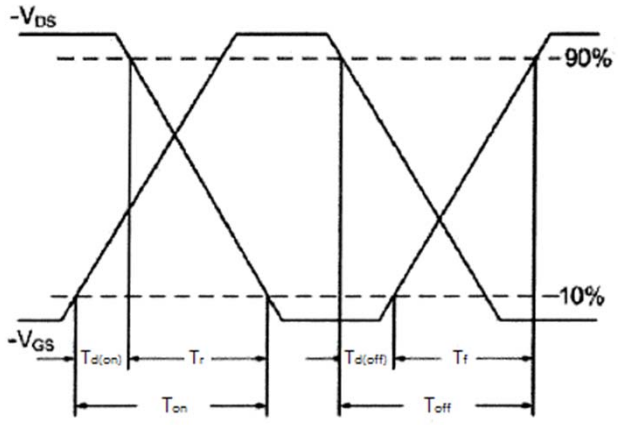


Fig. 10 - Switching Time Waveform



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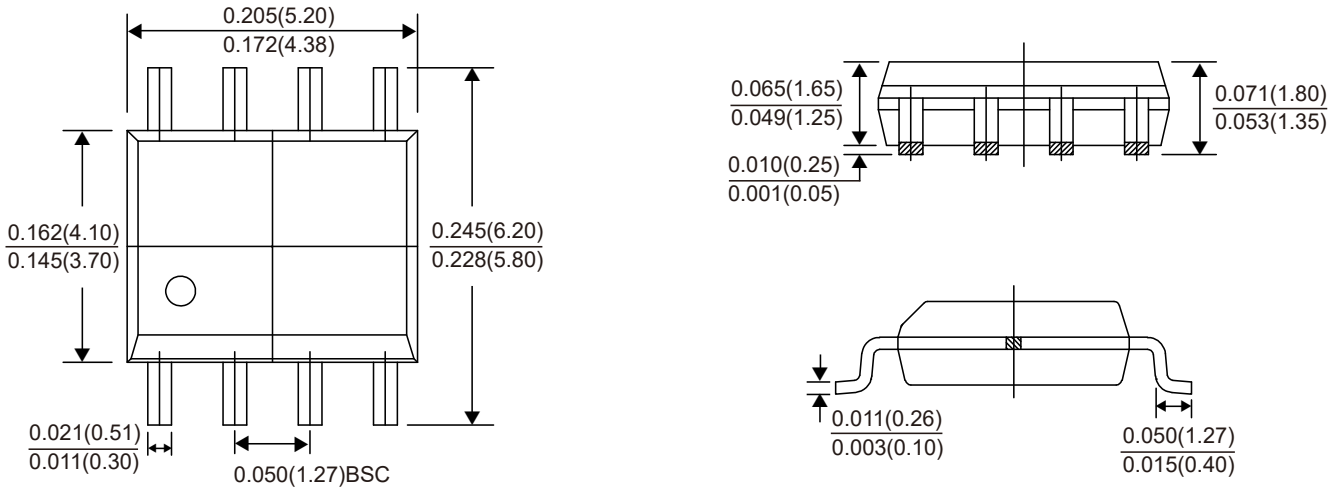
Package Outline Dimensions



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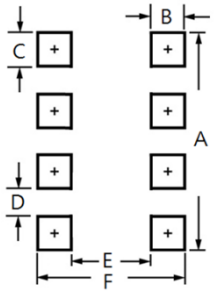
Dimensions in inches and (millimeters)

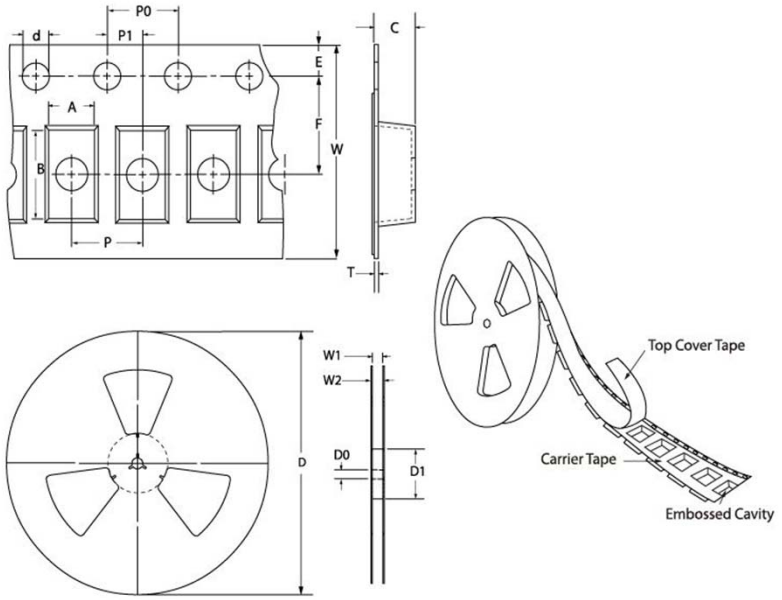
Suggested Pad Layout

Outline / Symbol	SOP-8 millimeters
A	4.51
B	1.00
C	0.70
D	0.57
E	4.40
F	6.40



Tape & Reel Specification

Item	Symbol	SOP-8 (mm)
Carrier width	A	6.4 ± 0.1
Carrier length	B	5.2 ± 0.1
Carrier depth	C	2.1 ± 0.1
Sprocket hole	d	1.5 ± 0.1
Reel outside diameter	D	330 ± 1
Feed hole diameter	D0	13.0 ± 0.3
Reel inner diameter	D1	100.0 ± 0.5
Sprocket hole position	E	1.7 ± 0.15
Punch hole position	F	5.5 ± 0.1
Sprocket hole pitch	P	8 ± 0.1
Sprocket hole pitch	P0	4 ± 0.1
Embossment center	P1	2 ± 0.05
Overall tape thickness	T	0.245 ± 0.15
Tape width	W	12.0 ± 0.15
Reel width	W2	18.6 (max)
Reel width	W1	14 (max)



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