Eternal Semiconductor Inc.

EV3415

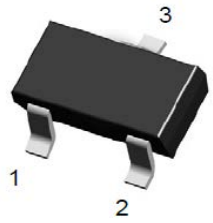
P-Channel Enhancement-Mode MOSFET (-20V, -4.0A)

PRODUCT SUMMARY

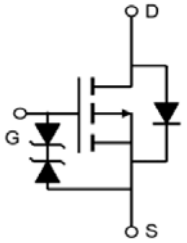
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Typ.
-20V	-4.0A	28 @ VGS = -4.5 V,ID=-4A
		33 @ VGS = -2.5V,ID=-4A
		38 @ VGS = -1.5V,ID=-2A

Features

- Super high dense cell trench design for low RDS(on)
- Rugged and reliable
- SOT-23-3L package
- ESD
- Lead（Pb）-free and halogen-free



EV3415 Pin Assignment & Symbol
3-Lead Plastic SOT-23-3L
Pin 1: Gate Pin 2: Source Pin3: Drain



Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D	Drain Current (Continuous)	-4	A
I_{DM}	Drain Current (Pulsed) [a]	-30	A
P_D	Total Power Dissipation @T_A=25°C	1.4	W
I_S	Maximum Diode Forward Current	2	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted)[b]	100	°C/W

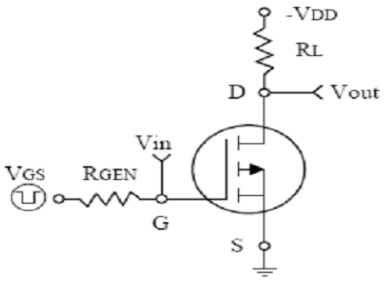
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

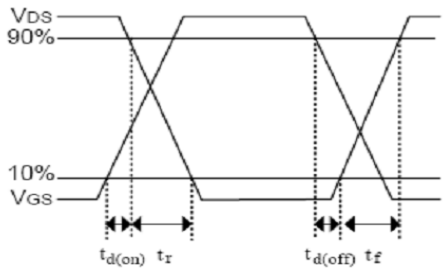
b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8V, V_{DS}=0V	-	-	±10	μA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.45	-0.55	-1	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V, I_D=-4A	-	28	34	mΩ
		V_{GS}=-2.5V, I_D=-4A	-	33	40	
		V_{GS}=-1.8V, I_D=-2A	-	38	46	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	950	-	PF
C_{oss}	Output Capacitance		-	165	-	
C_{rss}	Reverse Transfer Capacitance		-	120	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-10V, I_D=-1A, V_{GS}=-4.5V	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	10	-	
Q_{gd}	Gate-Drain Charge		-	19	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-10V, R_L=15Ω, I_D=1A, VGEN=-4.5V, RG=10Ω	-	12	-	nS
t_r	Turn-on Rise Time		-	10	-	
$t_{d(off)}$	Turn-off Delay Time		-	19	-	
t_f	Turn-off Fall Time		-	25	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=-1A	-	-	-1	V

Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%





Switching Test Circuit and Swithcing Waveforms

Typical Characteristics Curves (Ta=25°C, unless otherwise note)

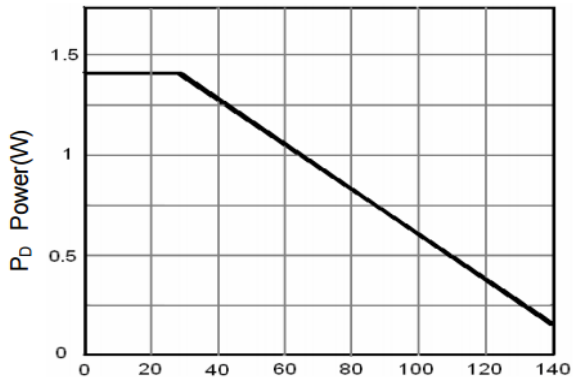


Figure 1 Power Dissipation

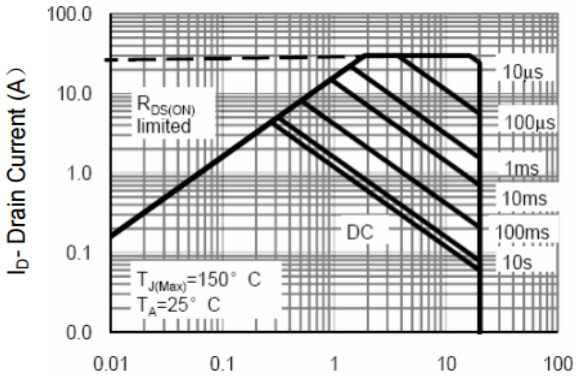


Figure 2 Safe Operation Area

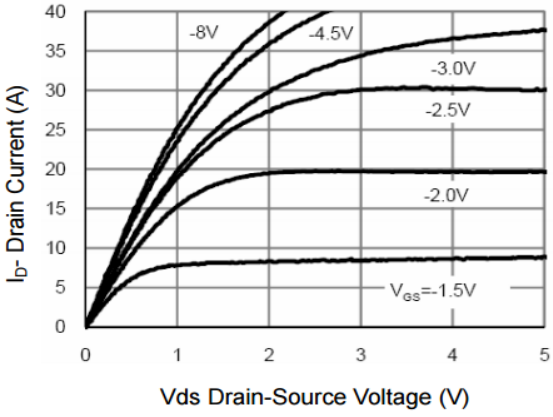


Figure 3 Output Characteristics

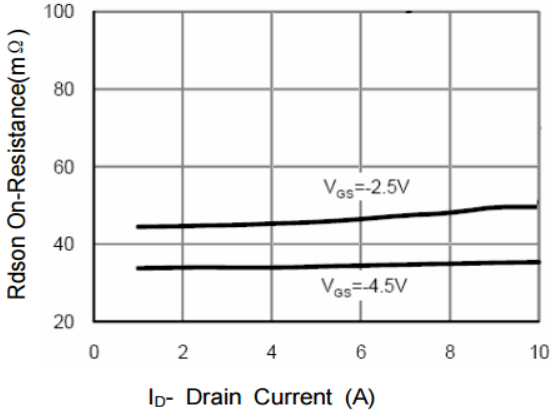


Figure 4 Drain-Source On-Resistance

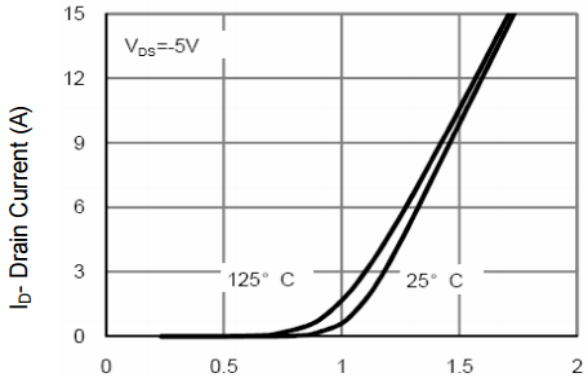


Figure 5 Transfer Characteristics

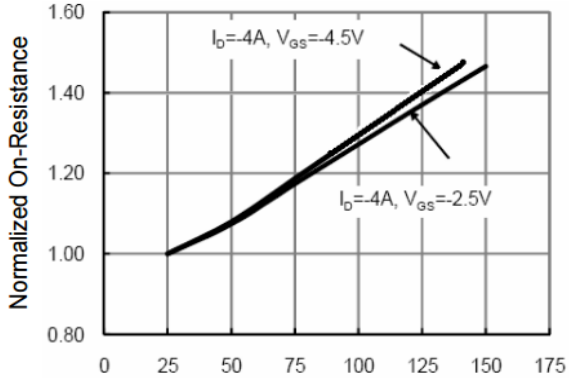


Figure 6 Drain-Source On-Resistance

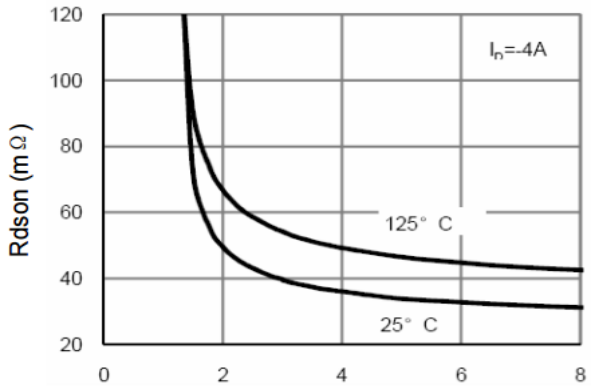


Figure 7 Rdson vs Vgs

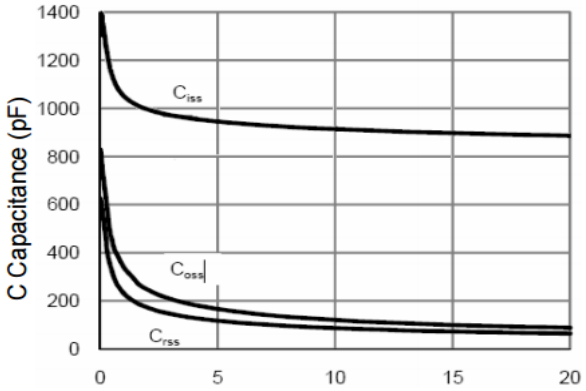


Figure 8 Capacitance vs Vds

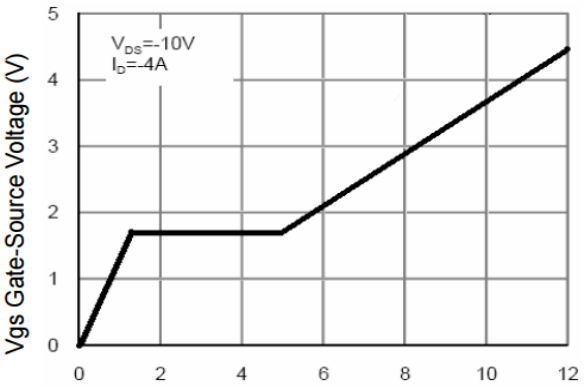


Figure 9 Gate Charge

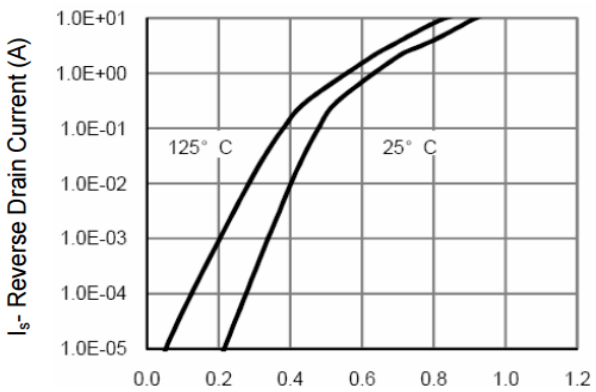


Figure 10 Source- Drain Diode Forward

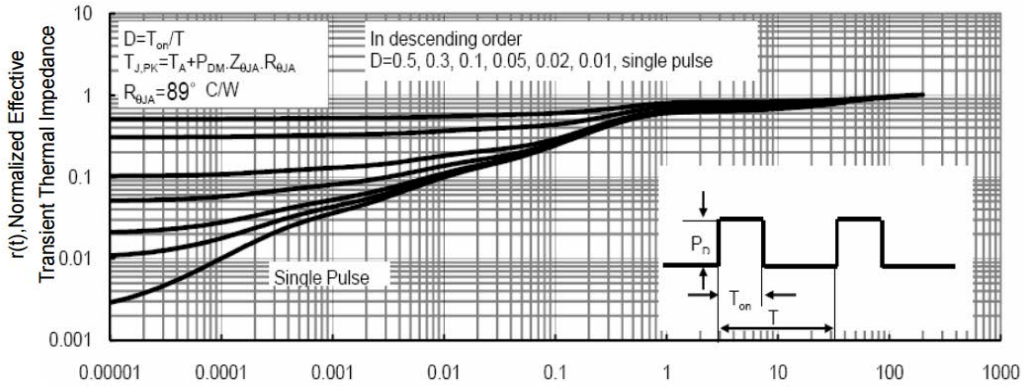
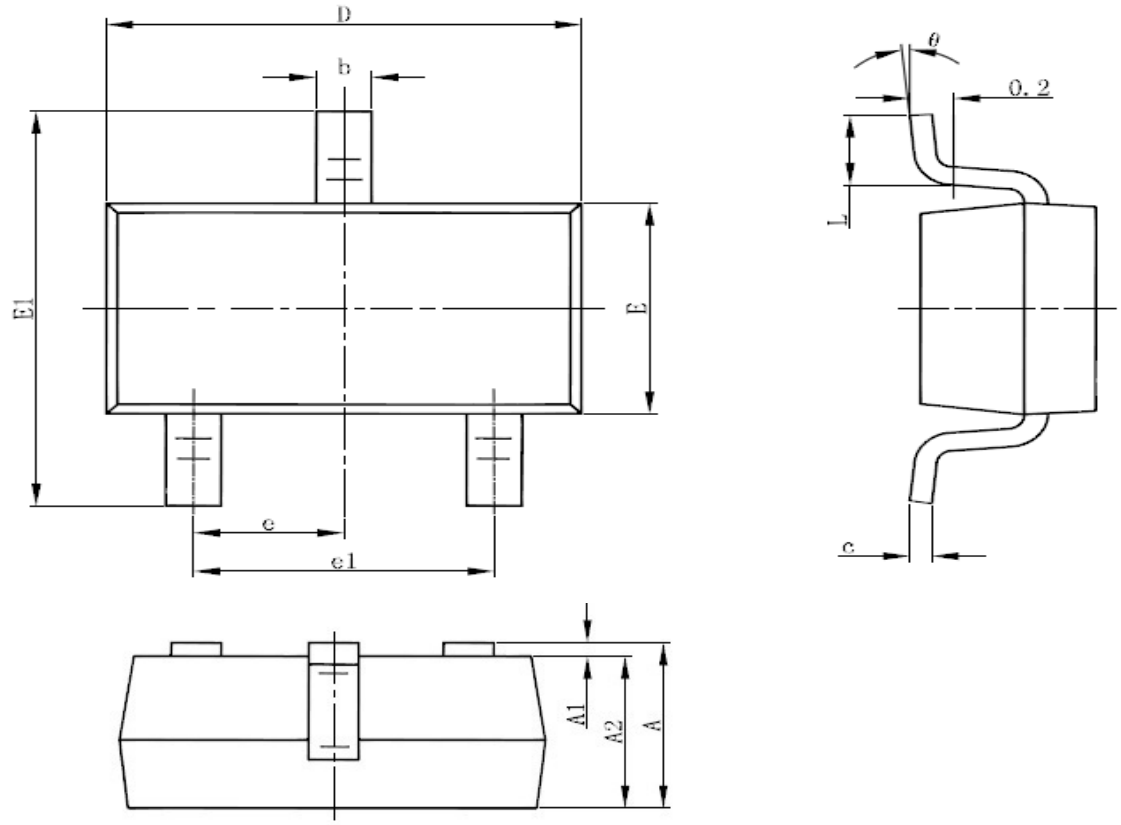


Figure 11 Normalized Maximum Transient Thermal Impedance

SOT23-3L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.850	1.250	0.033	0.049
A1	0.000	0.100	0.000	0.004
A2	0.7	1.150	0.028	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°