

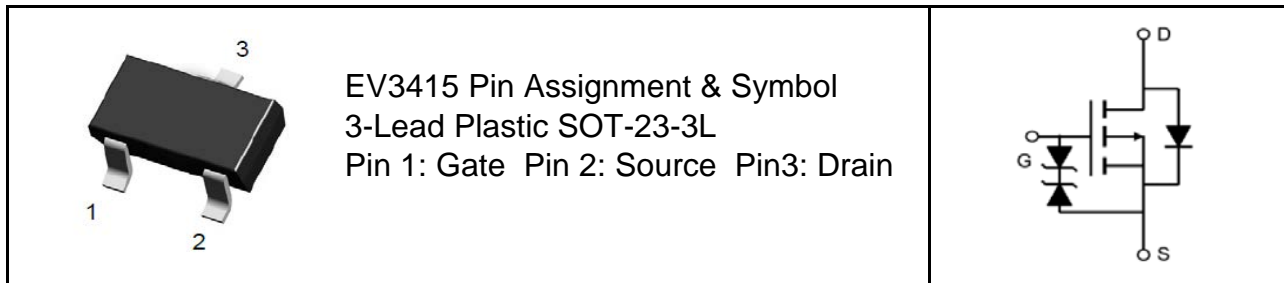
P-Channel Enhancement-Mode MOSFET (-20V, -4.0A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Typ.
-20V	-4.0A	34 @ $V_{GS} = -4.5V, I_D = -4A$
		44 @ $V_{GS} = -2.5V, I_D = -4A$
		55 @ $V_{GS} = -1.5V, I_D = -2A$

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



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, 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 @ $T_A = 25^\circ\text{C}$	1.4	W
I_S	Maximum Diode Forward Current	2	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted) ^b	100	$^\circ\text{C/W}$

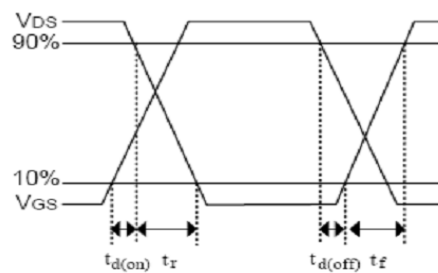
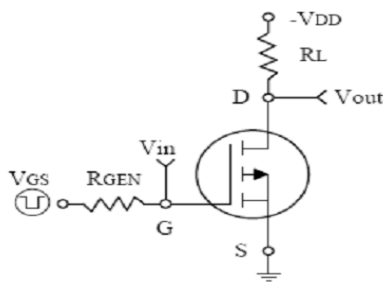
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in² 2oz Cu PCB board

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

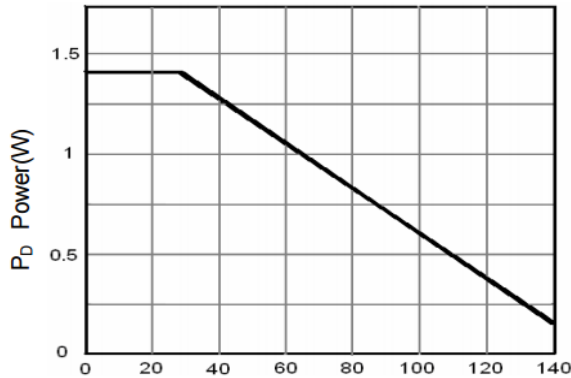
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8V, V _{DS} =0V	-	-	±100	nA
• 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	-	34	43	mΩ
		V _{GS} =-2.5V, I _D =-4A	-	44	54	
		V _{GS} =-1.8V, I _D =-2A	-	50	60	
• 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, V _{GEN} =-4.5V, R _G =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%

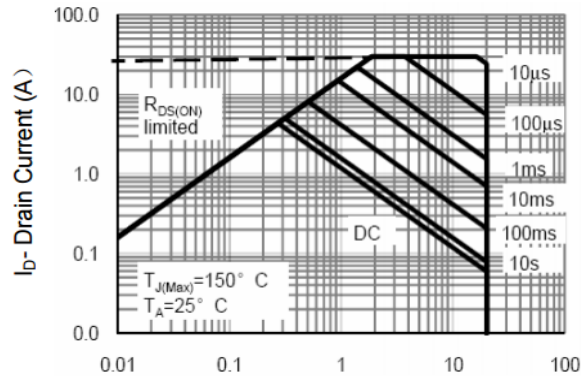


Switching Test Circuit and Switching Waveforms

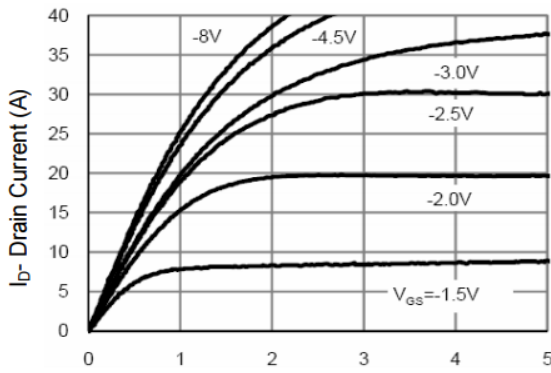
Typical Characteristics Curves ($T_a=25^\circ\text{C}$, unless otherwise note)



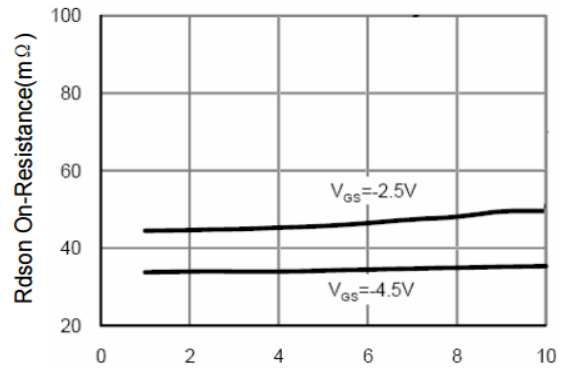
T_J -Junction Temperature($^\circ\text{C}$)
Figure 1 Power Dissipation



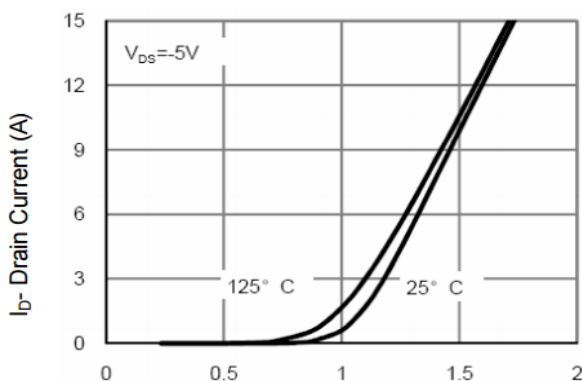
V_{DS} Drain-Source Voltage (V)
Figure 2 Safe Operation Area



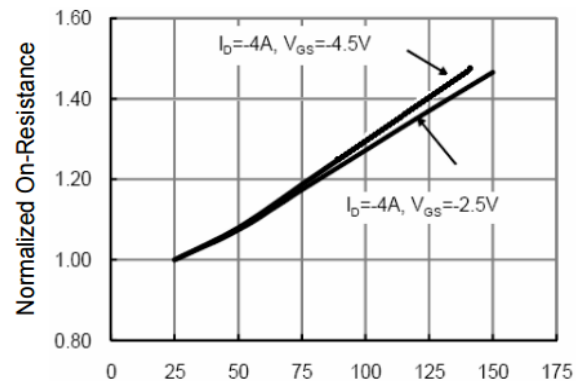
V_{DS} Drain-Source Voltage (V)
Figure 3 Output Characteristics



I_D - Drain Current (A)
Figure 4 Drain-Source On-Resistance



V_{GS} Gate-Source Voltage (V)
Figure 5 Transfer Characteristics



T_J -Junction Temperature($^\circ\text{C}$)
Figure 6 Drain-Source On-Resistance

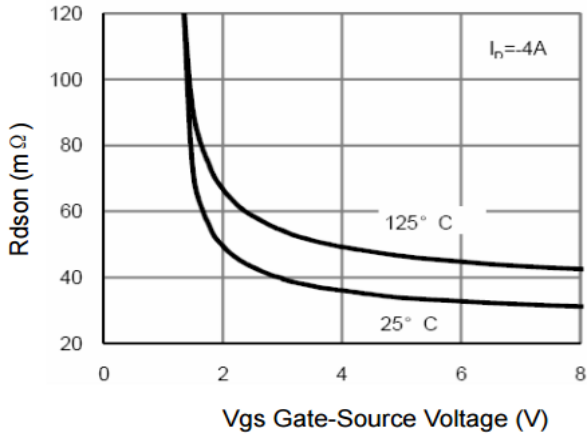


Figure 7 Rdson vs Vgs

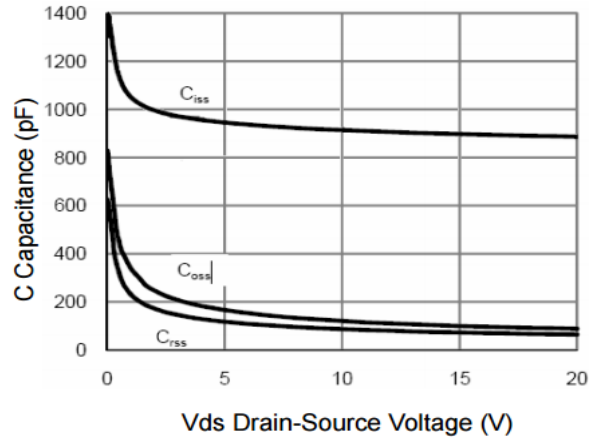


Figure 8 Capacitance vs Vds

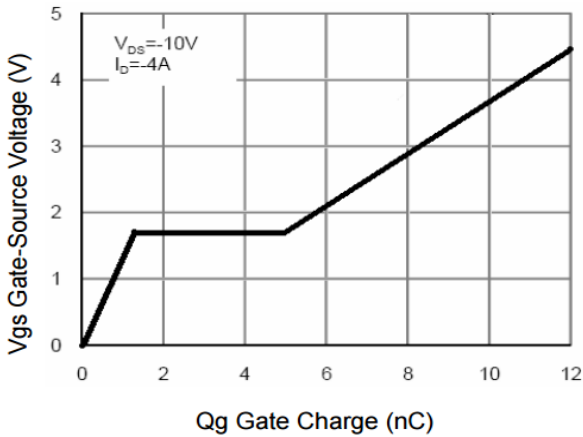


Figure 9 Gate Charge

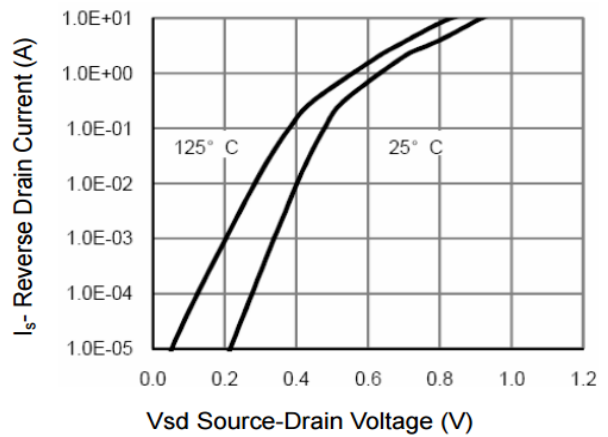


Figure 10 Source-Drain Diode Forward

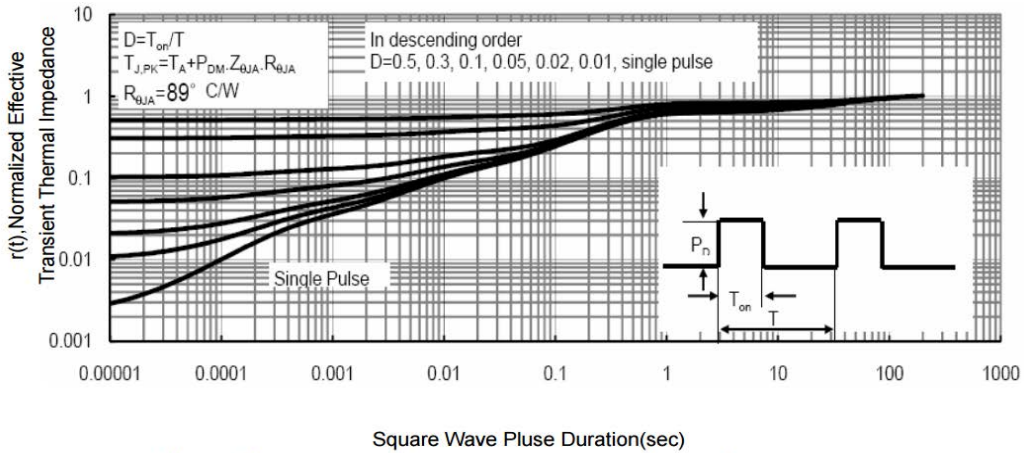
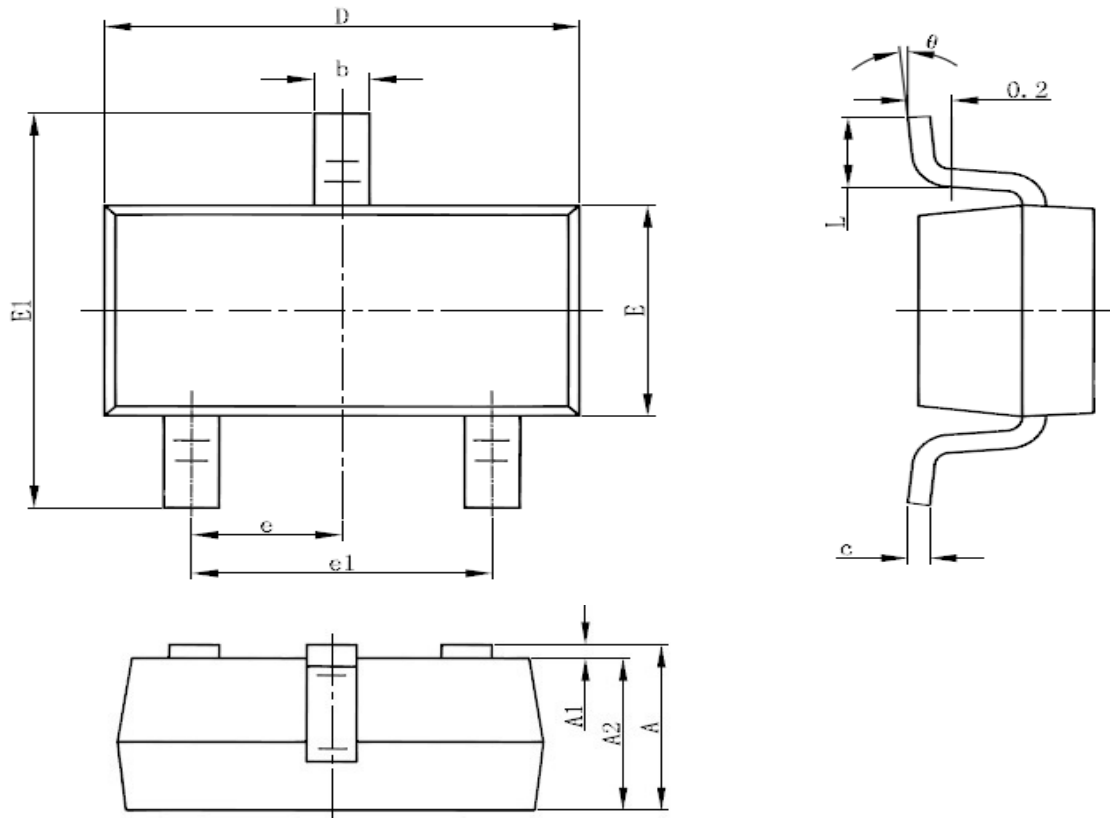


Figure 11 Normalized Maximum Transient Thermal Impedance

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°

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