

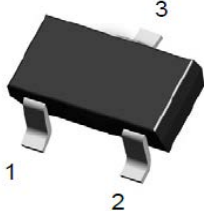
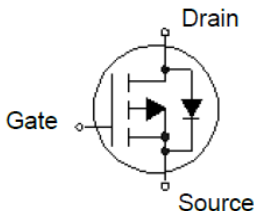
P-Channel Enhancement-Mode MOSFET (-20V, -5.9A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω)TYP
-20V	-5.9A	17.5 @ $V_{GS} = -4.5V, I_D = -5.9A$
		22.0 @ $V_{GS} = -2.5V, I_D = -3.0A$
		32.0 @ $V_{GS} = -1.8V, I_D = -1.5A$

Features

- Super high dense cell trench design for low $R_{DS(on)}$
- Rugged and reliable
- SOT-23-3L package
- Lead (Pb) -free and halogen-free

	<p>ET2315 Pin Assignment & Symbol 3-Lead Plastic SOT-23-3L Pin 1: Gate Pin 2: Source Pin3: Drain</p>	
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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	± 12	V
I_D	Drain Current (Continuous)	-5.9	A
I_{DM}	Drain Current (Pulsed) ^a	-24	A
P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$	1.7	W
I_S	Maximum Diode Forward Current	-1	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	75	$^\circ\text{C/W}$

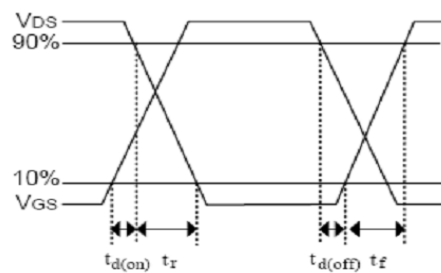
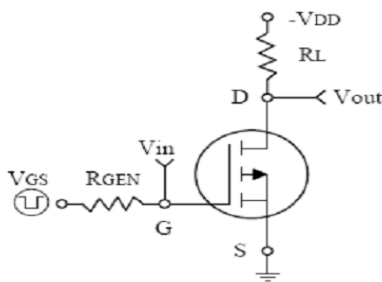
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in² 2oz Cu PCB board

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45		-1	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-5.9A$	-	17.5	21	m Ω
		$V_{GS}=-2.5V, I_D=-3A$		22.0	26	
		$V_{GS}=-1.8V, I_D=1.5A$	-	32.0	38	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	-	2310	-	PF
C_{oss}	Output Capacitance		-	225	-	
C_{rss}	Reverse Transfer Capacitance		-	210	-	
• Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS}=-10V, I_D=-1A, V_{GS}=-10V$	-	28.4	-	nC
Q_{gs}	Gate-Source Charge		-	3.8	-	
Q_{gd}	Gate-Drain Charge		-	7.5	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=15\Omega, I_D=1A, V_{GEN}=-4.5V, R_G=10\Omega$	-	9.5	-	nS
t_r	Turn-on Rise Time		-	56	-	
$t_{d(off)}$	Turn-off Delay Time		-	86	-	
t_f	Turn-off Fall Time		-	78	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V

Note: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



Switching Test Circuit and Switching Waveforms

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

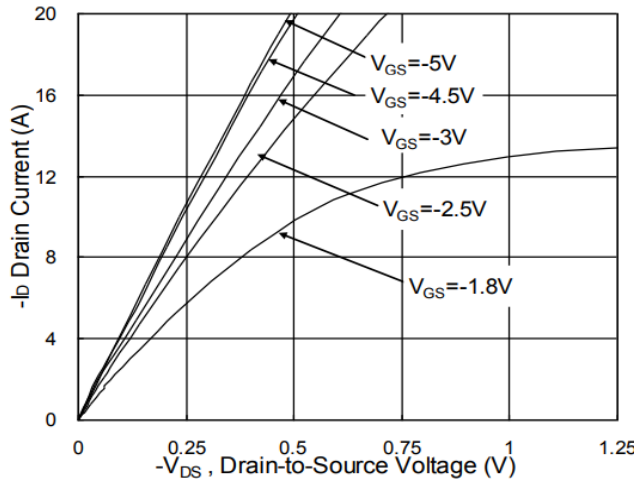


Fig.1 -V_{DS}, Drain-to-Source Voltage

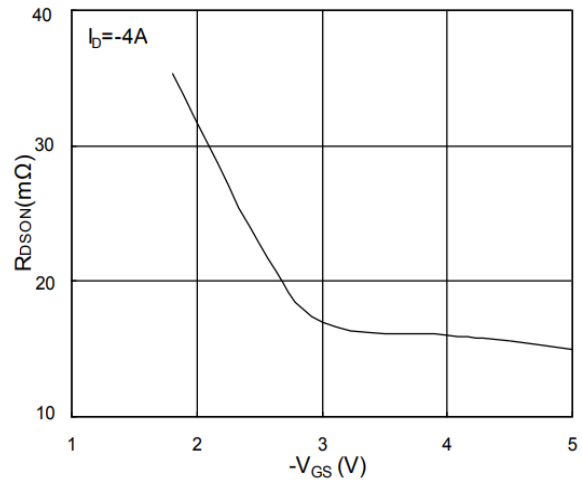


Fig.2 On-Resistance vs. Gate-Source

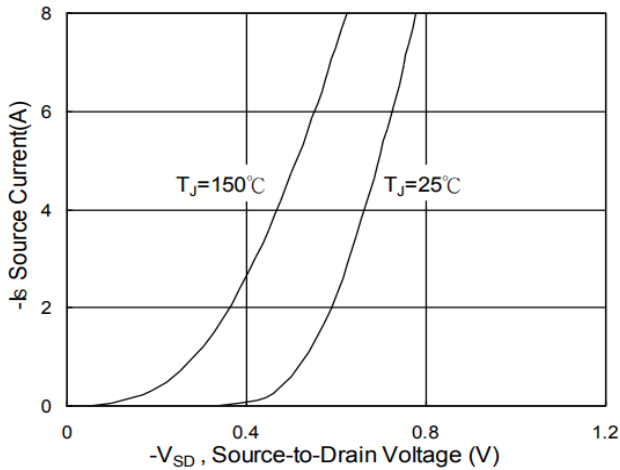


Fig.3 Forward Characteristics of Reverse

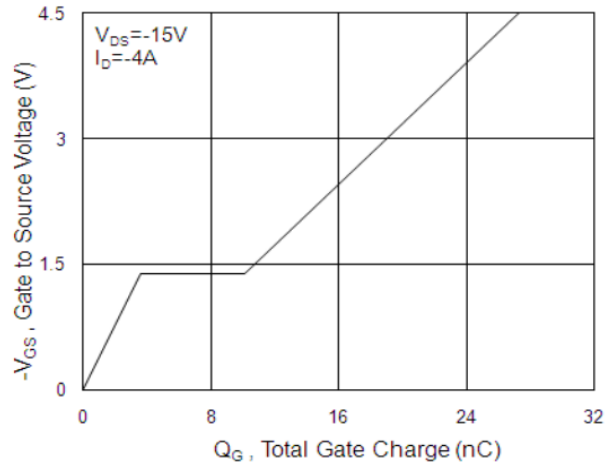


Fig.4 Gate-Charge Characteristics

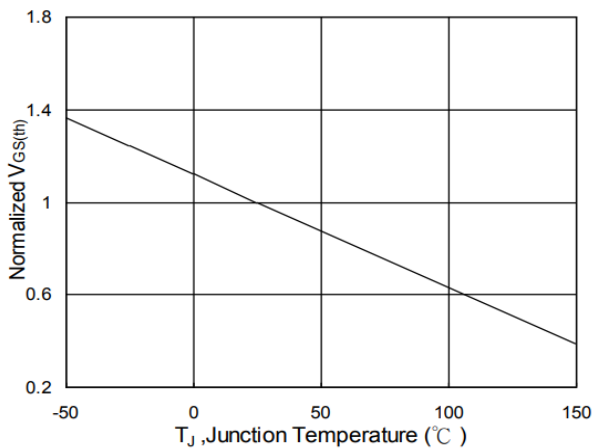


Fig.5 Normalized V_{GS(th)} vs. T_J

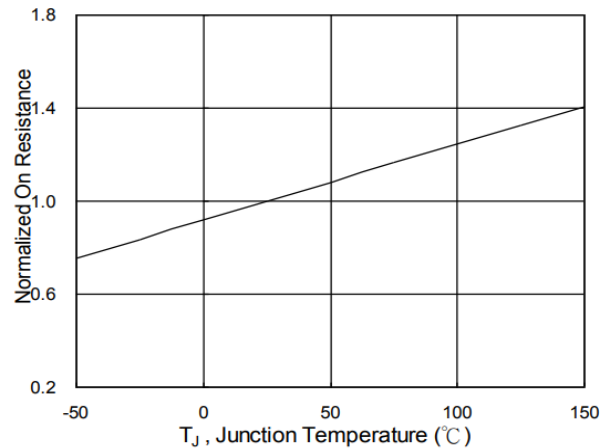


Fig.6 Normalized R_{DS(on)} vs. T_J

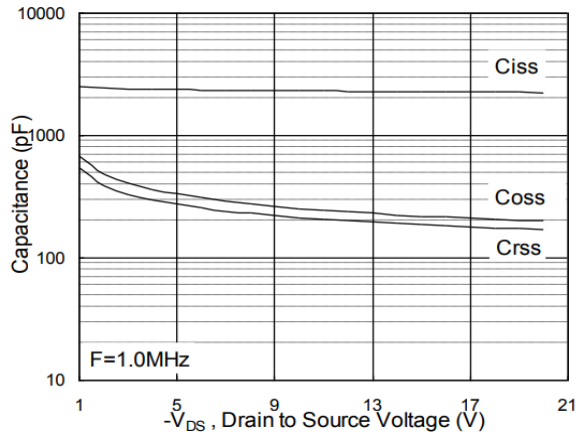


Fig.7 Capacitance

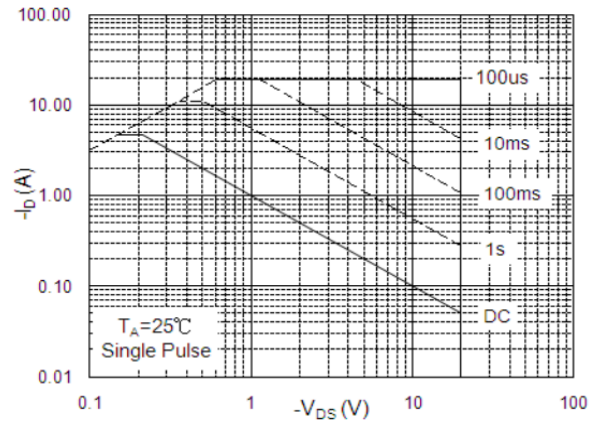


Fig.8 Safe Operating Area

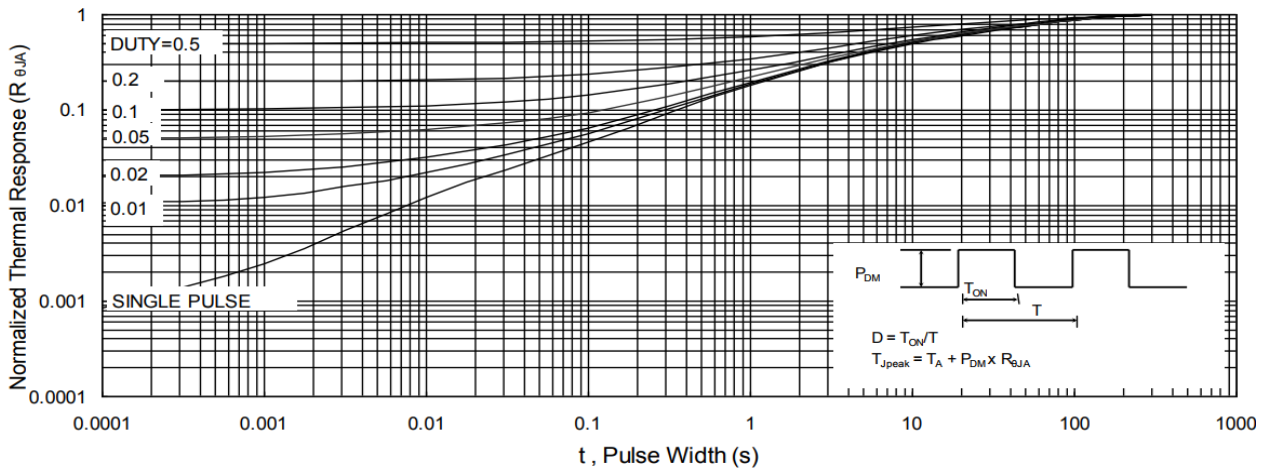
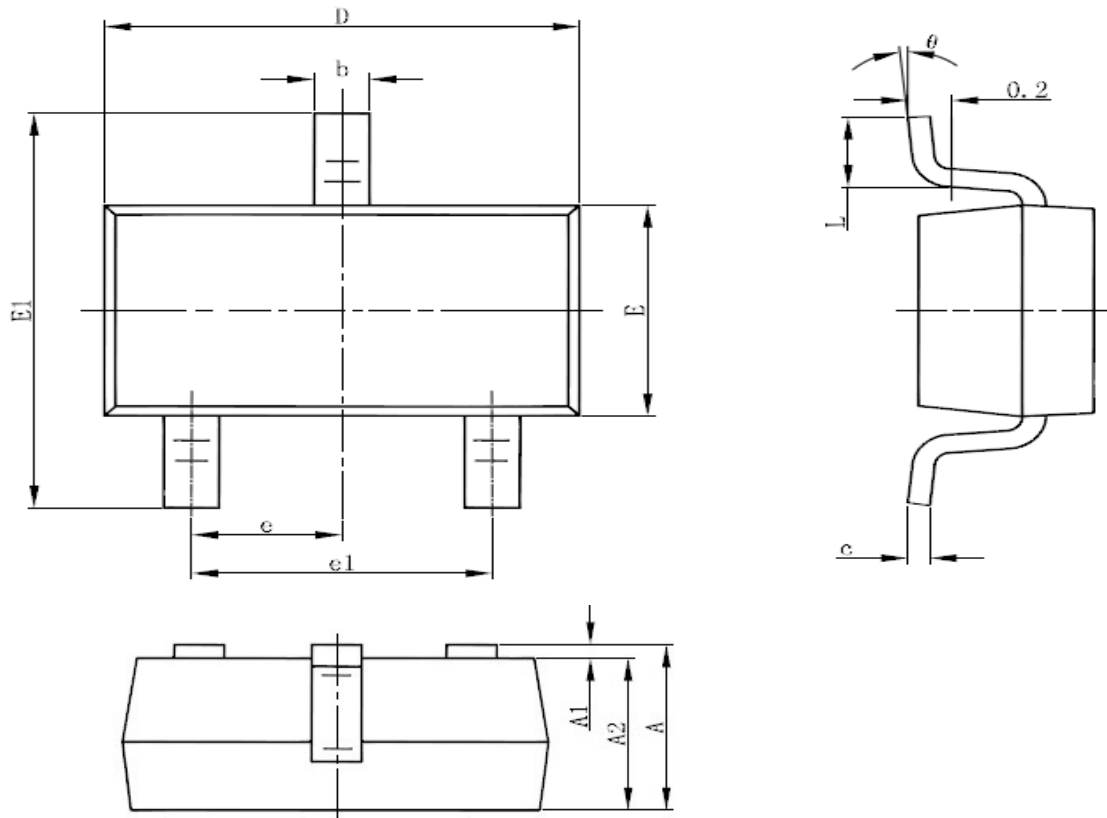


Fig.9 Normalized Maximum Transient Thermal Impedance

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
theta	0°	8°	0°	8°