N-Channel 600 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) (Typ.)	I_D (A)[a]	Q_g (Typ.)
600	25 at V_{GS} = 10 V	0.4	7.2 nC

FEATURES

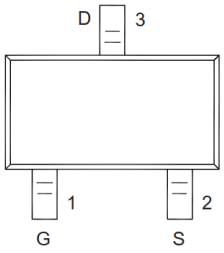
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested

RoHS COMPLIANT

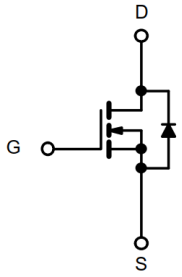
APPLICATIONS

- Power Management for Portable and Consumer
  - Load Switches
  - DC/DC Converters

SOT-23-3L Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	± 30	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	0.4	A
	T_C = 70 °C		0.25	
Pulsed Drain Current		I_{DM}	1.5	
Maximum Power Dissipation [a]	T_C = 25 °C	P_D	0.4	W
	T_C = 70 °C		0.256	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) [b]	R_{thJC}	312	°C/W

Notes:
a. T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	600	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600 V, V_{GS} = 0 V	-	-	1	µA
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	0.4	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.2 A	-	25	30	Ω
Forward Transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 0.2 A	-	0.9	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1MHz	-	160	-	pF
Output Capacitance	C_{oss}		-	22	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Total Gate Charge [c]	Q_g	V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 0.4 A	-	7.2	-	nC
Gate-Source Charge [c]	Q_{gs}		-	1.2	-	
Gate-Drain Charge [c]	Q_{gd}		-	3.1	-	
Gate Resistance	R_g	f = 1 MHz	-	6.7	-	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 300 V, I_D = 0.4 A, V_{GS} = 10 V, R_g = 0 Ω		8		ns
Rise Time	t_r			5		
Turn-Off DelayTime	$t_{d(off)}$			16		
Fall Time	t_f			22		
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source Current	I_S	T_C = 25 °C	-	-	0.4	A
Pulsed Source Current	I_{SM}		-	-	1.5	A
Forward Voltage [a]	V_{SD}	I_S = 0.4 A, V_{GS} = 0 V	-	-	1.6	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 1 A, dI/dt = 100 A/µs, T_J = 25 °C		178		ns
Body Diode Reverse Recovery Charge	Q_{rr}			288		nC
Reverse Recovery Fall Time	t_a			37		ns
Reverse Recovery Rise Time	t_b			141		

Notes

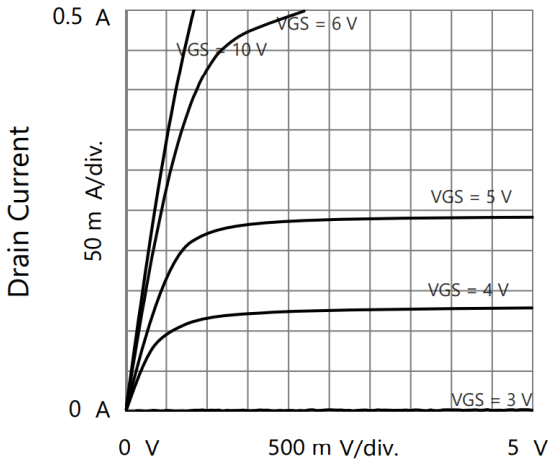
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

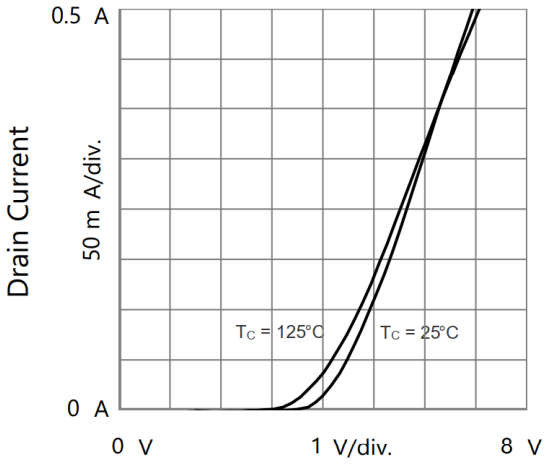
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

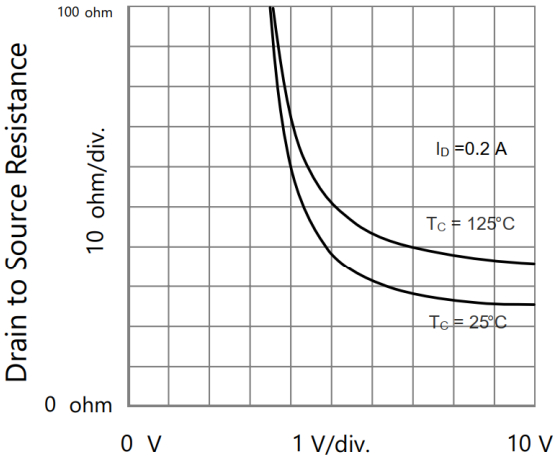
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



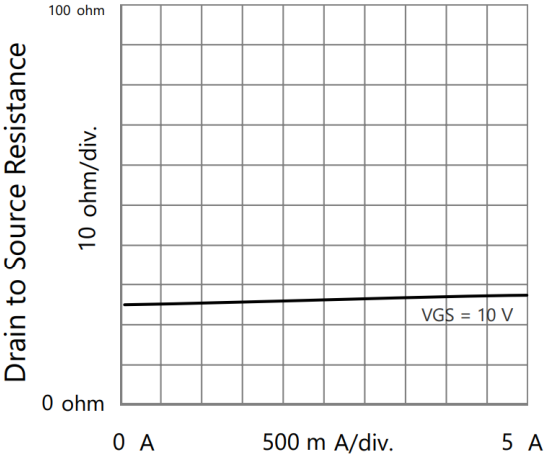
Drain to Source Voltage
Output Characteristics



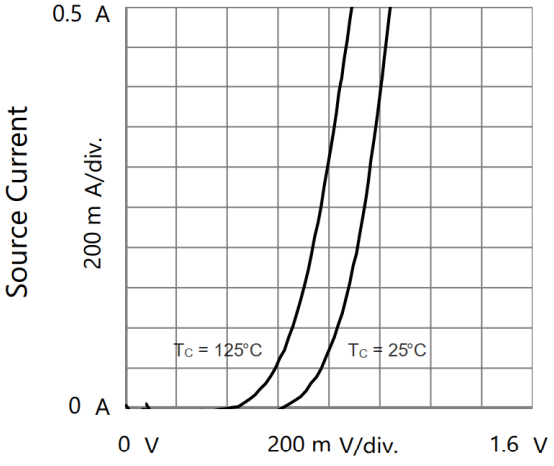
Gate to Source Voltage
Transfer Characteristics



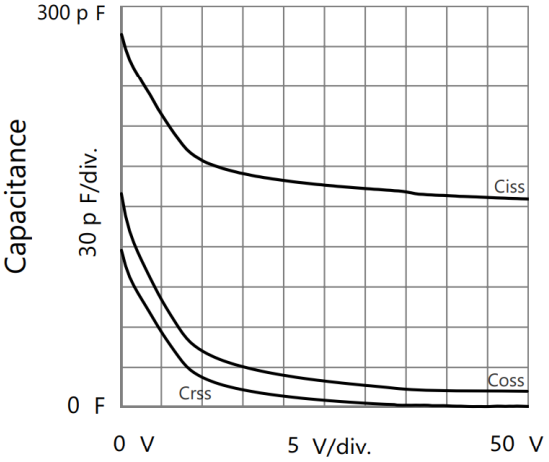
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

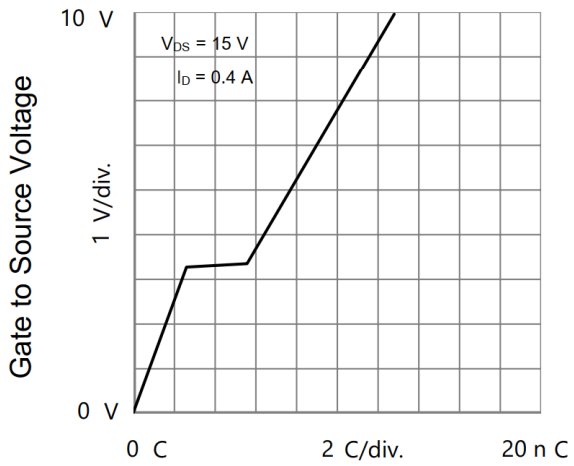


Source to Drain Voltage
Body Diode Forward Characteristics

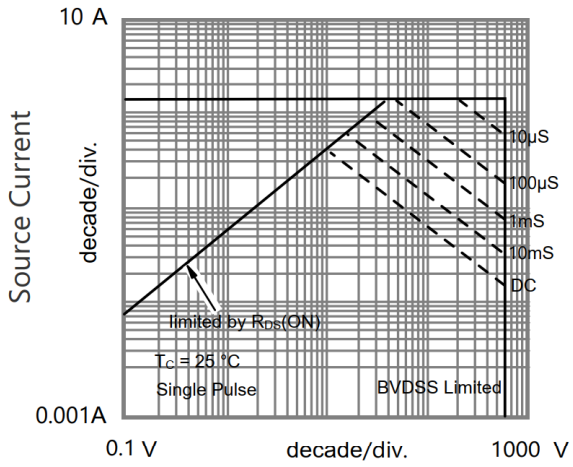


Drain to Source Voltage
Capacitances

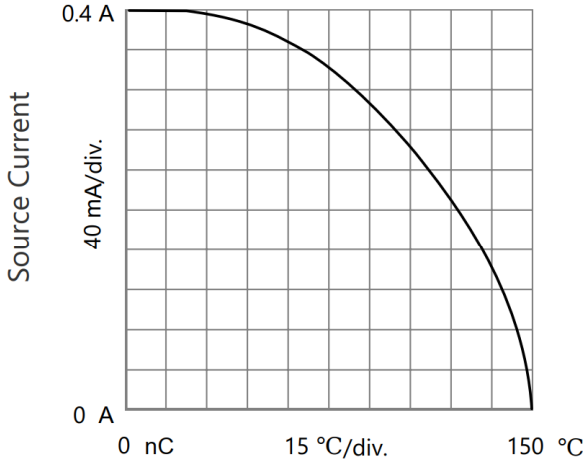
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



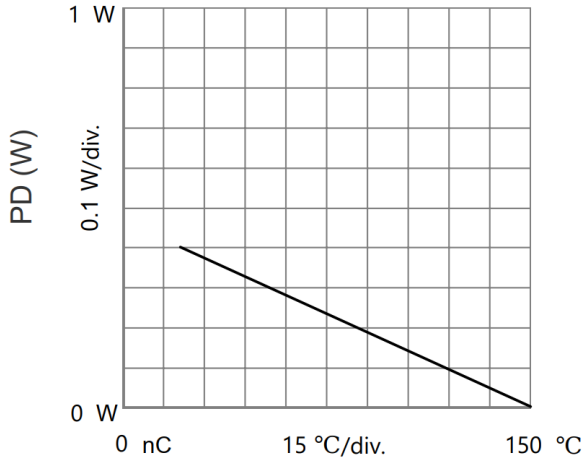
Gate to Source Voltage vs. GateCharge



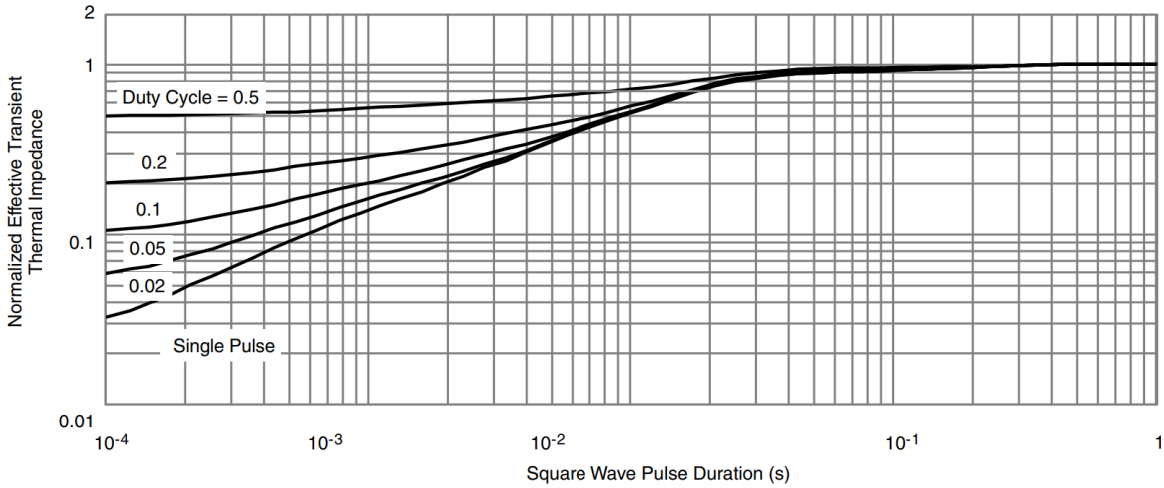
Safe Operating Area, Junction-to-Ambient



Current Derating

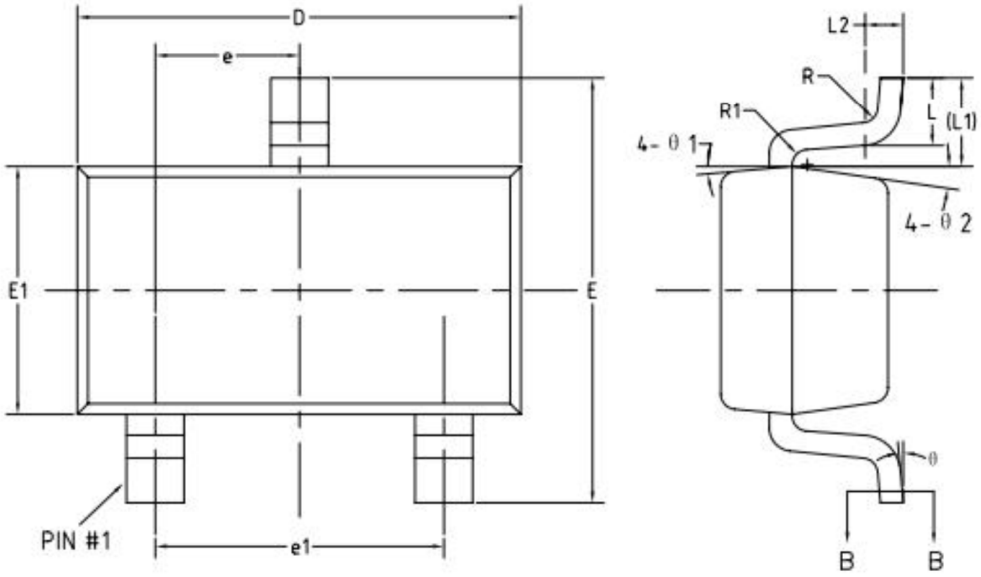


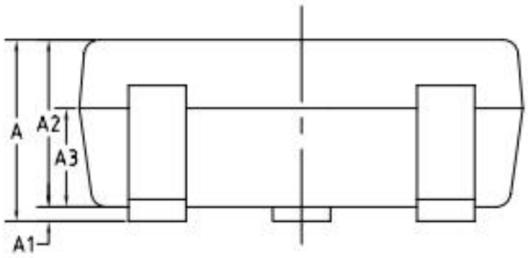
Power Derating

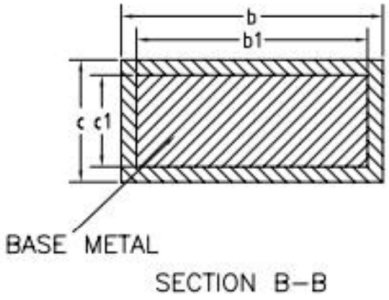


Normalized Thermal Transient Impedance, Junction-to-Foot

SOT-23-3L PACKAGE OUTLINE







SECTION B–B

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	-	-	1.50
A1	0.00	-	0.18
A2	0.85	1.10	1.35
A3	0.58	0.65	0.72
b	0.23	-	0.53
b1	0.20	0.40	0.50
c	0.09	-	0.22
c1	0.08	0.13	0.21
D	2.78	2.95	3.10
E	2.58	2.80	3.03
E1	1.55	1.65	1.78
e	0.83	0.95	1.07
e1	1.78	1.90	2.02
L	0.28	0.45	0.62
L1	0.59REF		
L2	0.25BSC		
R	0.04	-	-
R1	0.04	-	0.21
θ	0°	-	8°
θ 1	8°	10°	12°
θ 2	8°	10°	12°

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