

P-Channel 60-V (D-S) MOSFET



RoHS
COMPLIANT

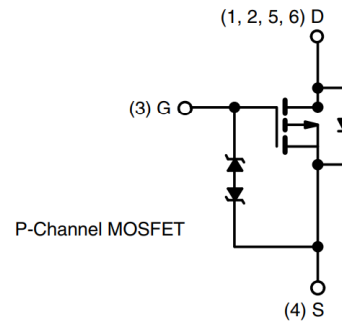
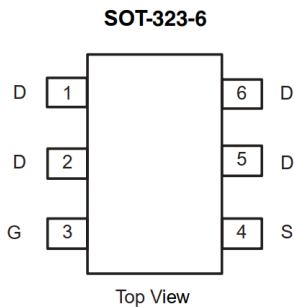
PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
-60	172 at V _{GS} = 10 V	1.8 ^a	3.5 nC
	208 at V _{GS} = 4.5 V	1.5 ^a	

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS tested
- ESD protection

APPLICATIONS

- Load Switch
- DC/DC converter



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V _{DS}	-60	V
Gate-source voltage	V _{GS}	± 20	
Continuous drain current	I _D	T _C = 25 °C ^a	-1.8
		T _C = 125 °C	-1.2
Continuous source current (diode conduction) ^a	I _S	-1.8	A
Pulsed drain current ^b	I _{DM}	-6.9	
Single pulse avalanche current	L = 0.1 mH	I _{AS}	-8
Single pulse avalanche energy		E _{AS}	3.3
Maximum power dissipation ^b	P _D	T _C = 25 °C	3.5
		T _C = 125 °C	0.7
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 ^c	R _{thJA}	120
Junction-to-foot (drain)	R _{thJF}	42	°C/W

Notes

- Package limited
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- When mounted on 1" square PCB (FR4 material)

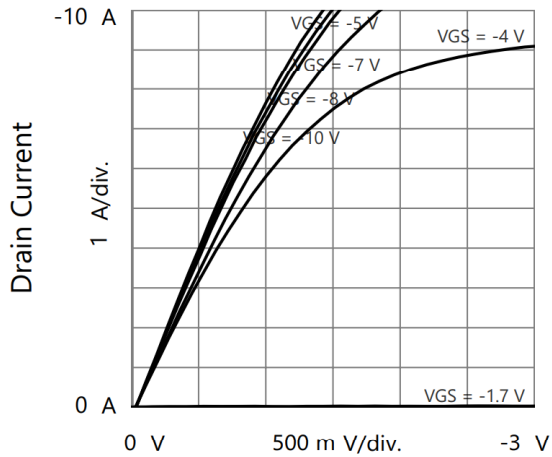
SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = -250 μA		-60	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA		-1	-	-3	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 12 V		-	-	± 5	μA
		V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 5	mA
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = -60 V	-	-	-1	μA
		V _{GS} = 0 V	V _{DS} = -60 V, T _J = 125 °C	-	-	-50	
		V _{GS} = 0 V	V _{DS} = -60 V, T _J = 150 °C	-	-	-150	
On-state drain current ^a	I _{D(on)}	V _{GS} = -10 V	V _{DS} ≤ -5 V	-1.8	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V	I _D = -1 A	-	172	289	mΩ
		V _{GS} = -10 V	I _D = -1 A, T _J = 125 °C	-	-	355	
		V _{GS} = -10 V	I _D = -1 A, T _J = 150 °C	-	-	438	
		V _{GS} = -4.5 V	I _D = -1 A	-	208	450	
Forward transconductance ^b	g _{fs}	V _{DS} = -10 V, I _D = -1 A		-	3	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = -30 V, f = 1 MHz	-	557	-	pF
Output capacitance	C _{oss}			-	51	-	
Reverse transfer capacitance	C _{rss}			-	34	-	
Total gate charge ^c	Q _g	V _{GS} = -4.5 V	V _{DS} = -30 V, I _D = -1 A	-	3.5	-	nC
Gate-source charge ^c	Q _{gs}			-	1.2	-	
Gate-drain charge ^c	Q _{gd}			-	1.9	-	
Gate resistance	R _g	f = 1 MHz		-	34	-	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = -30 V, R _L = 30 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _g = 1 Ω		-	43	68	ns
Rise time ^c	t _r			-	27	35	
Turn-off delay time ^c	t _{d(off)}			-	12	20	
Fall time ^c	t _f			-	9	15	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	-6.9	A
Forward voltage	V _{SD}	I _F = -0.5 A, V _{GS} = 0 V		-	-0.8	-1.2	V

Notes

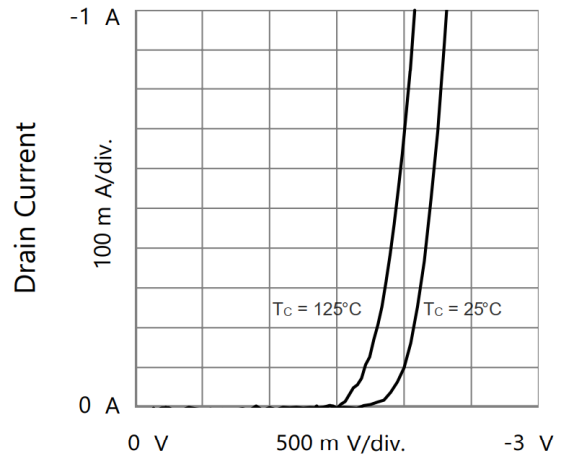
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

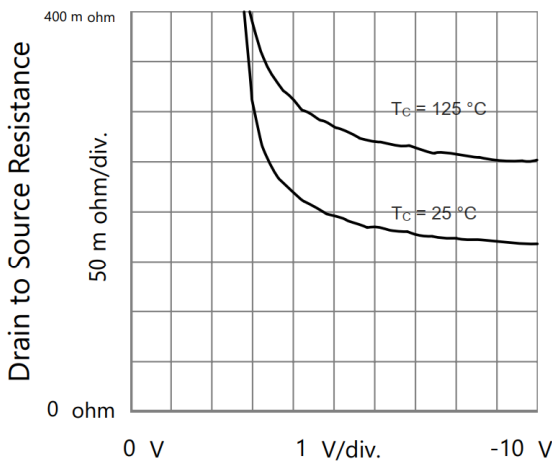
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



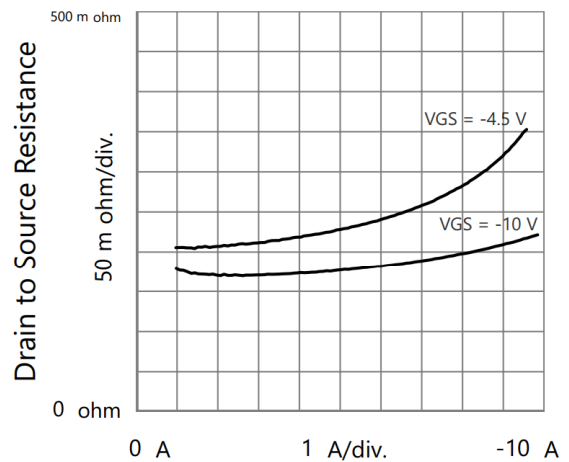
Drain to Source Voltage
Output Characteristics



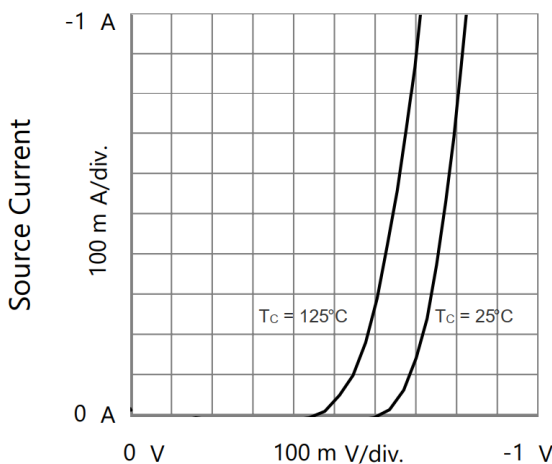
Gate to Source Voltage
Transfer Characteristics



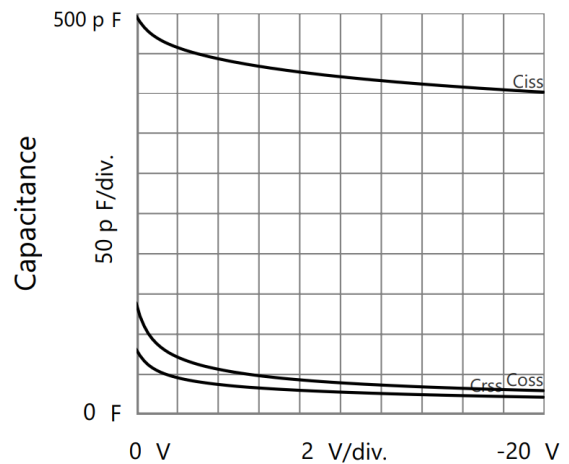
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

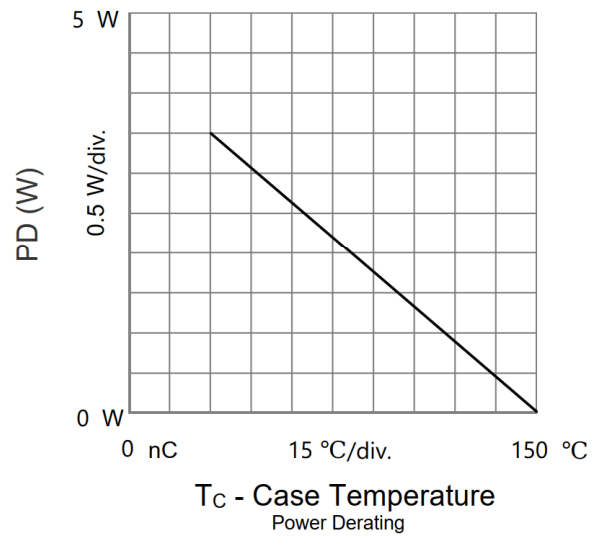
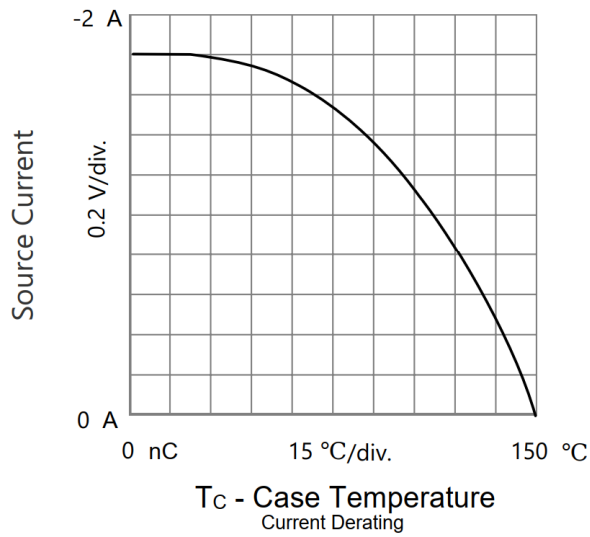
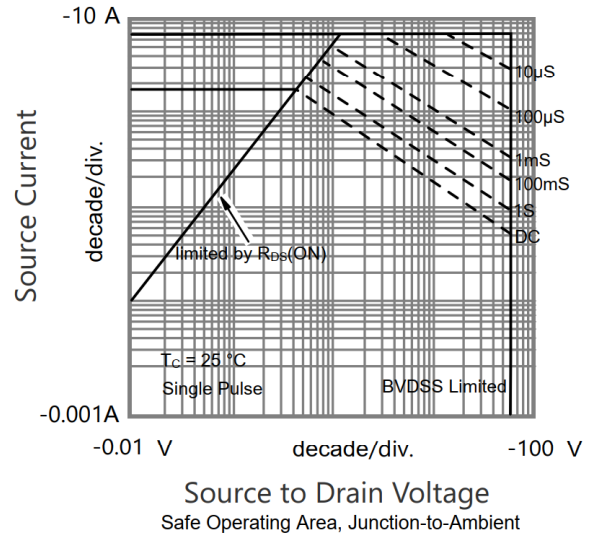
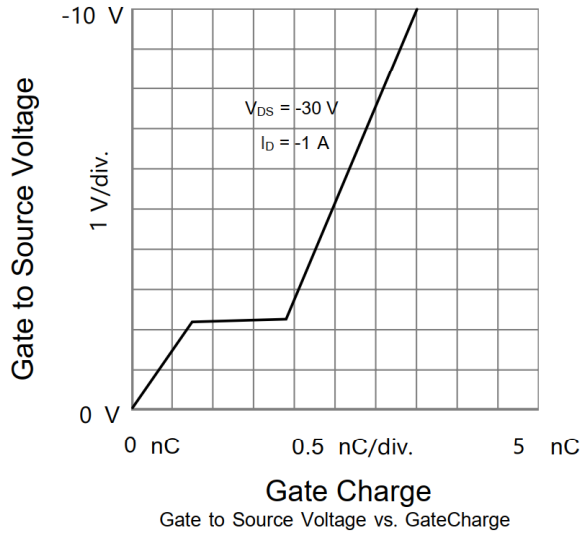


Source to Drain Voltage
Body Diode Forward Characteristics

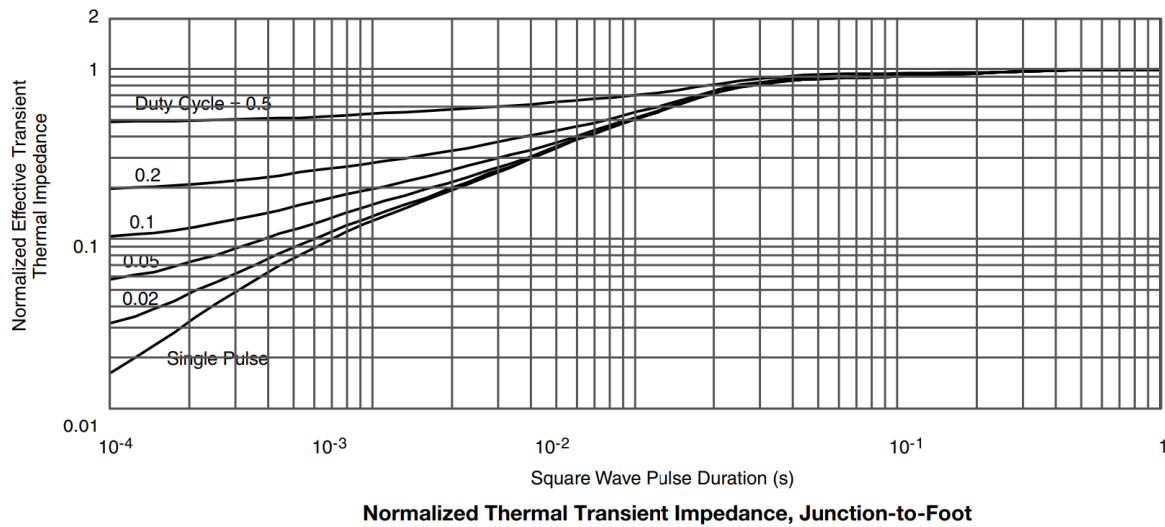


Drain to Source Voltage
Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



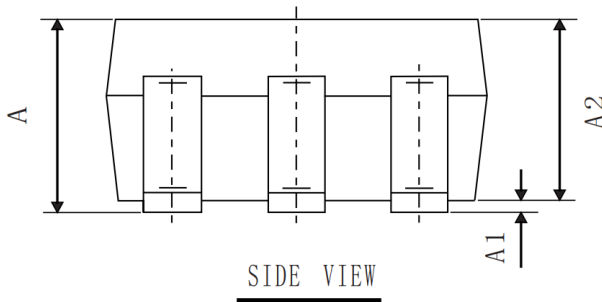
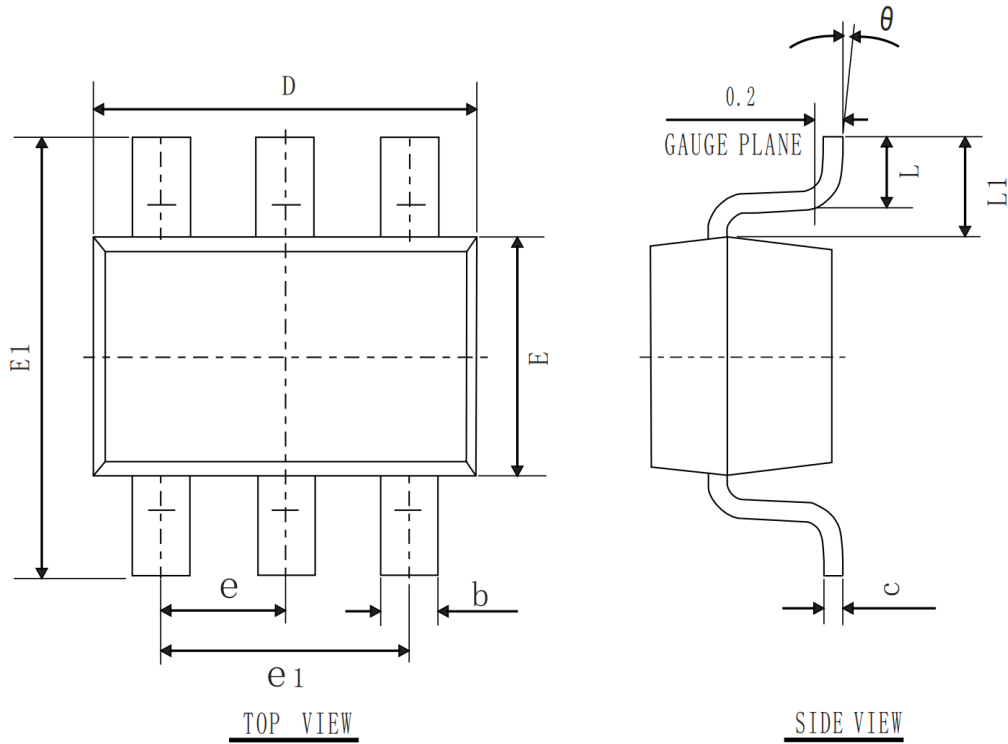
THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^\circ\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Foot ($25\text{ }^\circ\text{C}$)
 are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions

SOT-323-6L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.25	0.30
c	0.08	0.10	0.15
e1	1.20	1.30	1.40
D	2.00	2.10	2.20
E	1.15	1.25	1.35
E1	2.15	2.30	2.45
L	0.26	0.36	0.46
θ	0°	4°	8°
L1	0.525 REF		
e	0.65 TYP		

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