

60V N-Channel Trench MOSFET
Product Summary

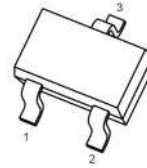
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	1.5Ω@10V	0.33A
	1.7Ω@4.5V	

Features

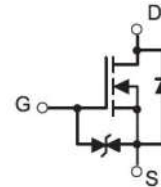
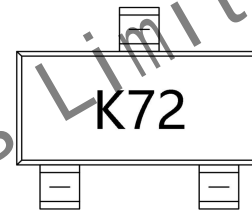
- Trench Technology Power MOSFET
- Low $R_{DS(on)}$
- Low Gate Charge
- ESD Protected:2KV(HBM)

Applications

- Load Switch
- DC/DC Converter

SOT-323


PIN1:GATE
PIN2:SOURCE
PIN3:DRAIN

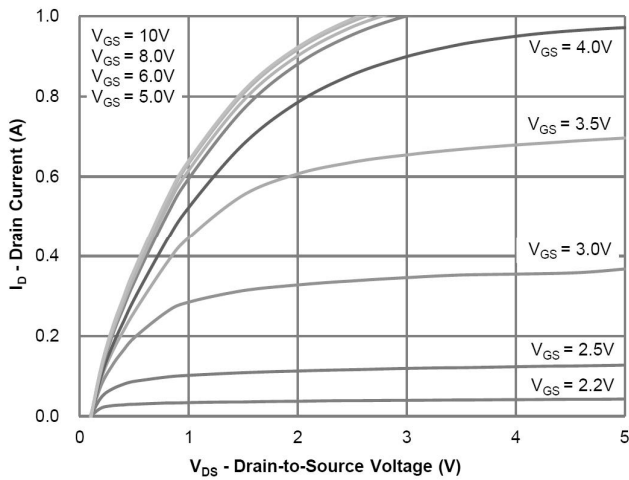
Schematic diagram

Marking

Absolute Maximum rating ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	60	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_A = 25^\circ\text{C}$	I_D	0.33	A
	$T_A = 70^\circ\text{C}$		0.25	
Pulsed Drain Current		I_{DM}	1.0	A
Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	0.3	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	416	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^\circ\text{C}$

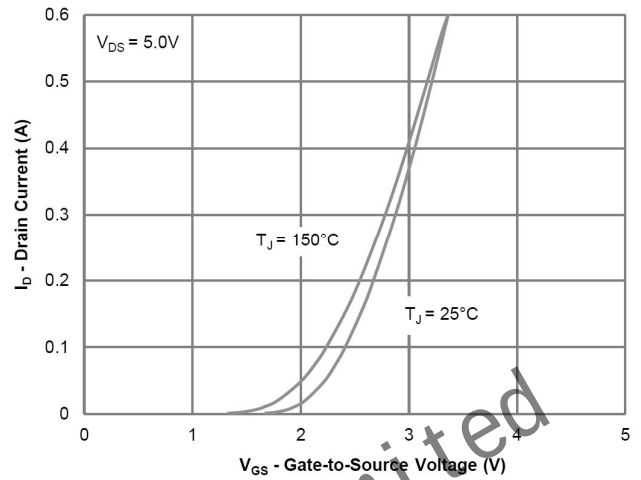
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V, T _J =25°C			1	μA
		V _{DS} = 60V, V _{GS} = 0V, T _J =125°C			500	
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.6	2.5	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 300mA		1.5	2.2	Ω
		V _{GS} = 4.5V, I _D = 200mA		1.7	2.6	
Forward Transconductance	g _{fs}	V _{DS} = 5.0V, I _D = 200mA		340	700	mS
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f= 1MHz		19	50	pF
Output Capacitance	C _{oss}			7.2	16	
Reverse Transfer Capacitance	C _{rss}			3.3	7	
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f= 1MHz		415	600	Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 30V, V _{GS} = 10V, I _D =0.3A		0.8	1.5	nC
Gate-source Charge	Q _{gs}			0.12	0.3	
Gate-drain Charge	Q _{gd}			0.2	0.4	
Gate Plateau Voltage	V _{plateau}			2.9	6	V
Turn-on Delay Time	t _{d(on)}	V _{DD} = 30V, V _{GS} = 10V, I _D =300mA, R _g = 3Ω		2.8	10	ns
Turn-on Rise Time	t _r			2.2	9	
Turn-off Delay Time	t _{d(off)}			13	50	
Turn-off Fall Time	t _f			5.5	22	
Source - Drain Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 0.3A			1.2	V
Maximum Continuous Drain to Source Diode Forward Current	I _S				0.2	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				0.8	A

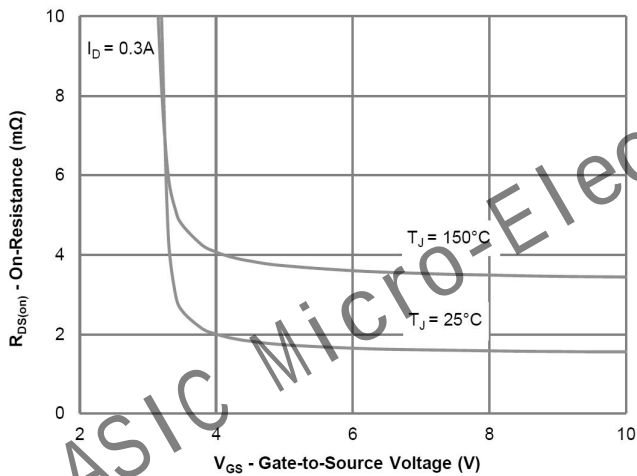
Typical Characteristic



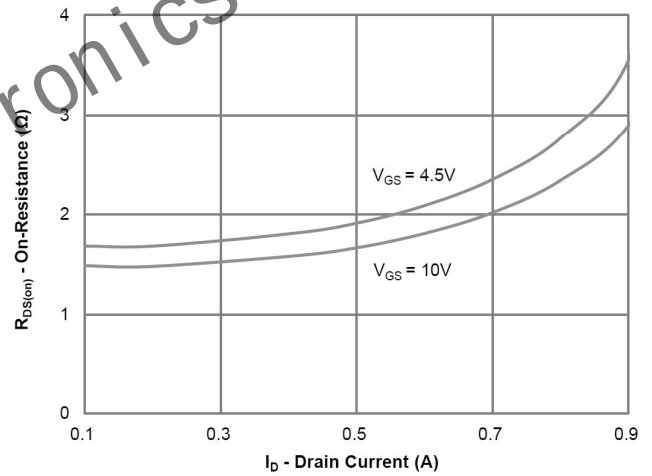
Output Characteristics



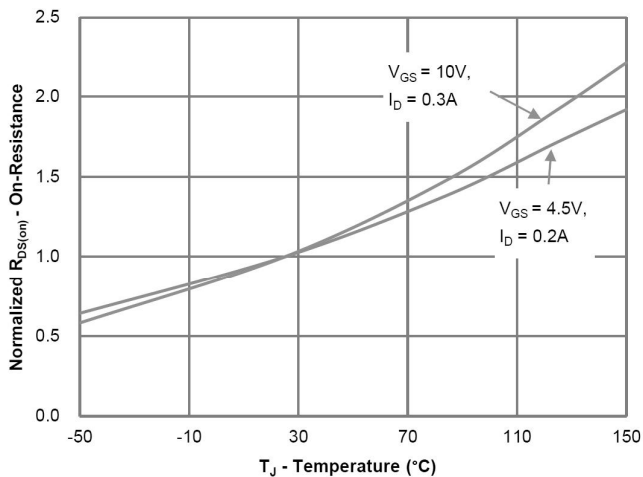
Transfer Characteristics



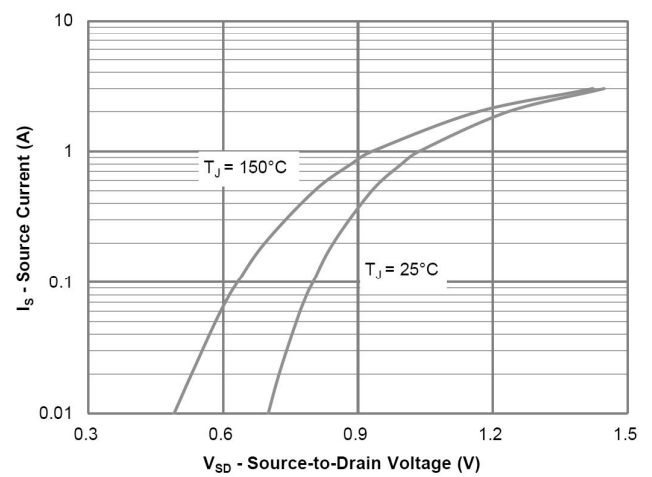
On-Resistance vs. Gate-Source Voltage



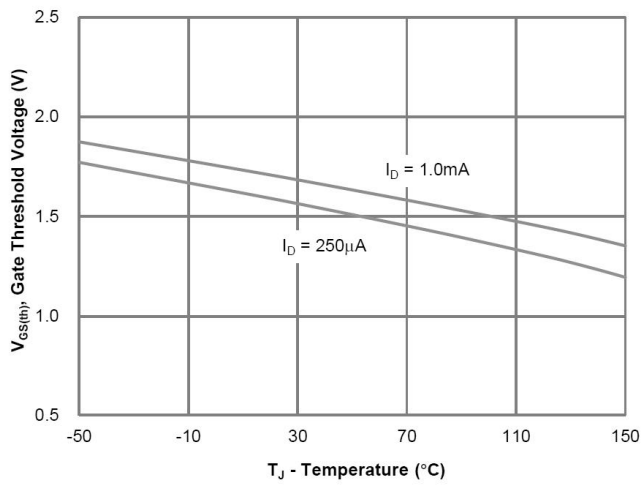
On-Resistance vs. Gate-Source Voltage



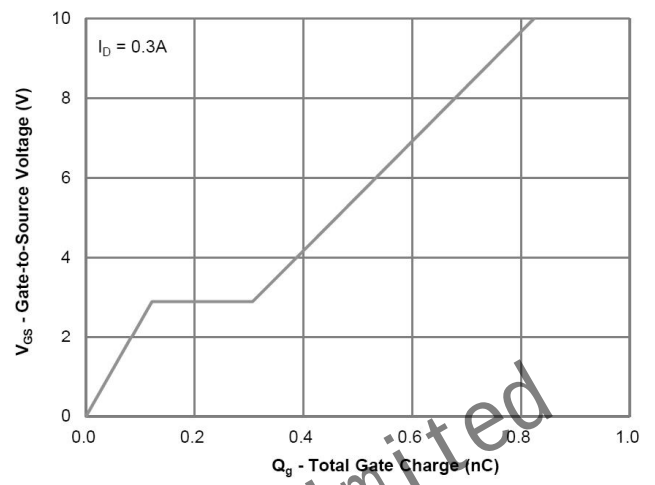
On-Resistance vs. Junction Temperature



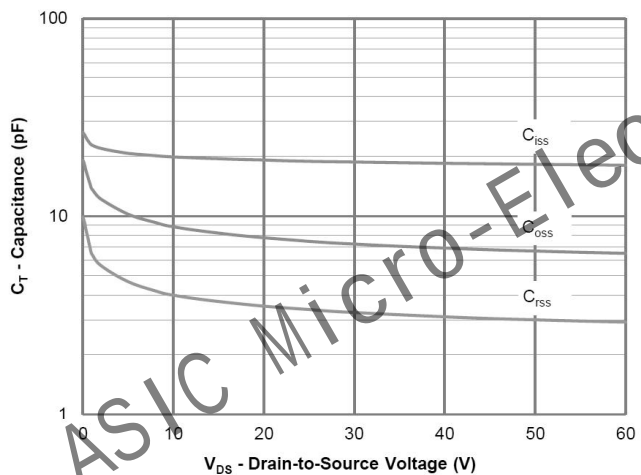
Source-Drain Diode Forward Voltage



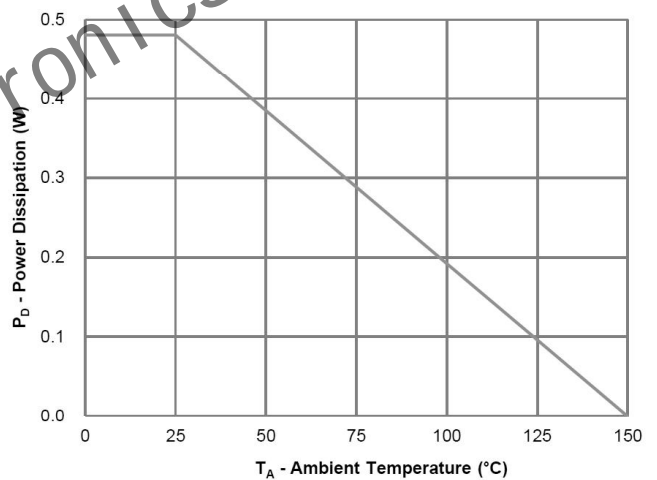
Gate Threshold Variation vs. Junction Temperature



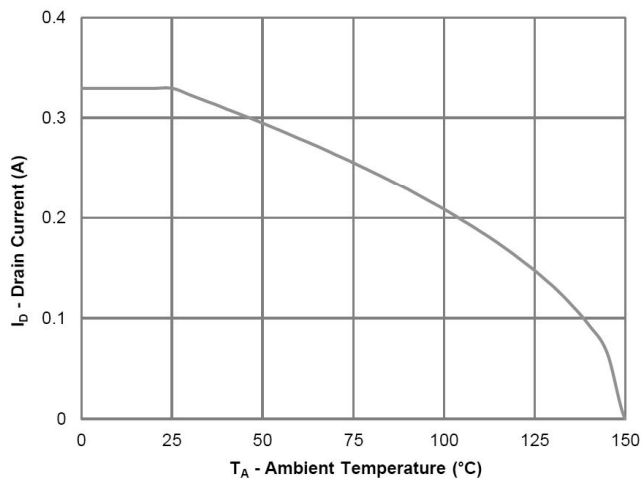
Gate Charge Characteristics



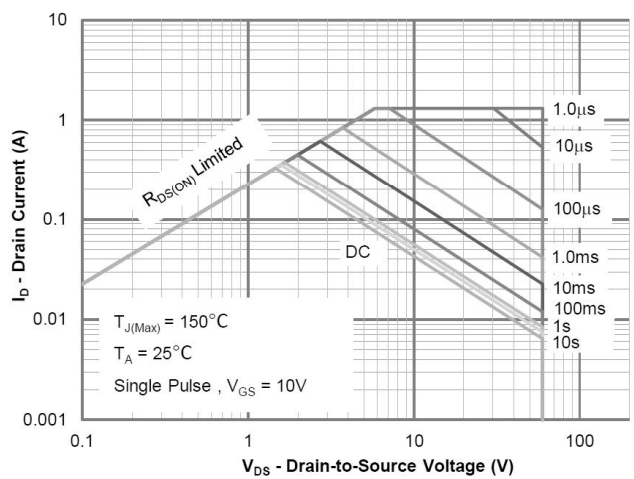
Capacitance Characteristics



Power Derating



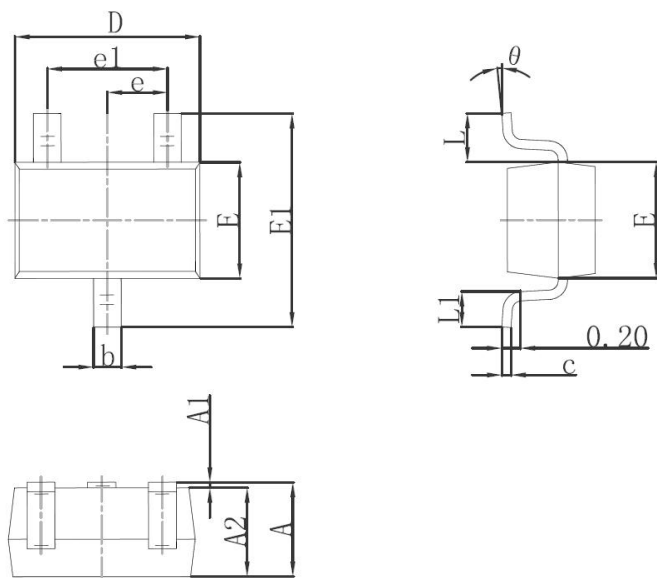
Current Derating



Safe Operating Area

Dimension

SOT-323



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°