

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
100	250 at V _{GS} = 10 V	2	9 nC
	275 at V _{GS} = 4.5 V		

FEATURES

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

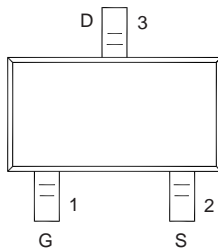


RoHS
COMPLIANT

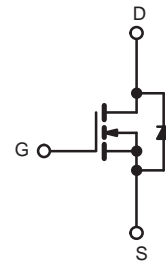
APPLICATIONS

- DC/DC Converters
- Load Switch
- LED Backlighting in LCD TVs

(SOT-23-3L)



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	2	A
	T _C = 70 °C	1.5	
Pulsed Drain Current	I _{DM}	6.5	
Single-Pulse Avalanche Energy	E _{AS}	2.5	mJ
Maximum Power Dissipation	T _C = 25 °C	2.2	W
	T _C = 70 °C	1.4	
	T _A = 25 °C	1.1 ^{b,c}	
	T _A = 70 °C	0.71 ^{b,c}	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b,d}	R _{thJA}	110	113	°C/W
Maximum Junction-to-Case	R _{thJC}	50	56.8	

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under steady state conditions is 166 °C/W.

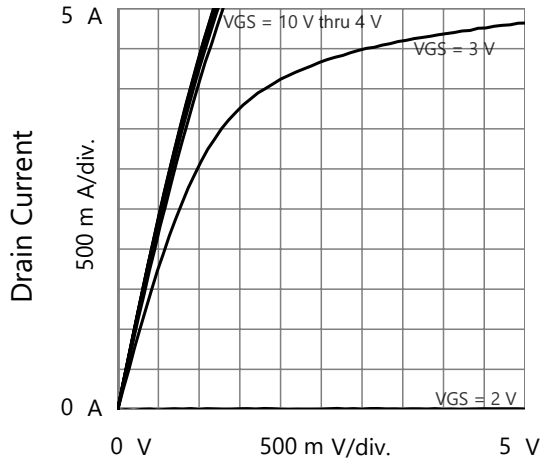
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$	100			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 4.5\text{ V}$	2			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$		250	355	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 1.5\text{ A}$		275	310	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 20\text{ V}, I_D = 1.5\text{ A}$		3		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		350		pF
Output Capacitance	C_{oss}			15		
Reverse Transfer Capacitance	C_{rss}			9.5		
Total Gate Charge	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$		9		nC
Gate-Source Charge	Q_{gs}			0.75		
Gate-Drain Charge	Q_{gd}			2		
Gate Resistance	R_g	$f = 1\text{ MHz}$		3		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 39\text{ }\Omega$ $I_D \cong 1.5\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		9		ns
Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			12		
Fall Time	t_f			8		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			2	A
Pulse Diode Forward Current (100 μs)	I_{SM}				6.5	
Body Diode Voltage	V_{SD}	$I_S = 1\text{ A}$			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 1.5\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		23		ns
Body Diode Reverse Recovery Charge	Q_{rr}			22		nC
Reverse Recovery Fall Time	t_a			18		ns
Reverse Recovery Rise Time	t_b			7		

Notes:

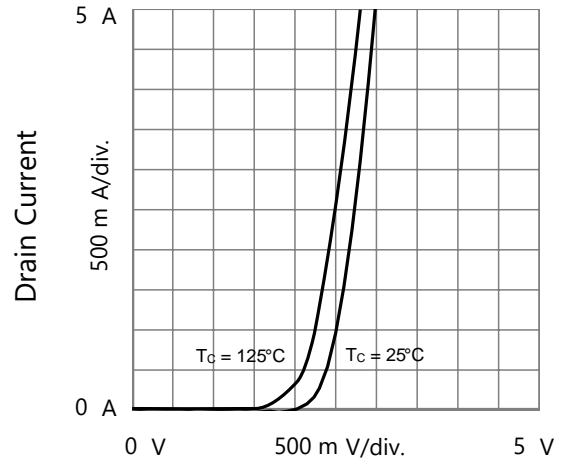
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

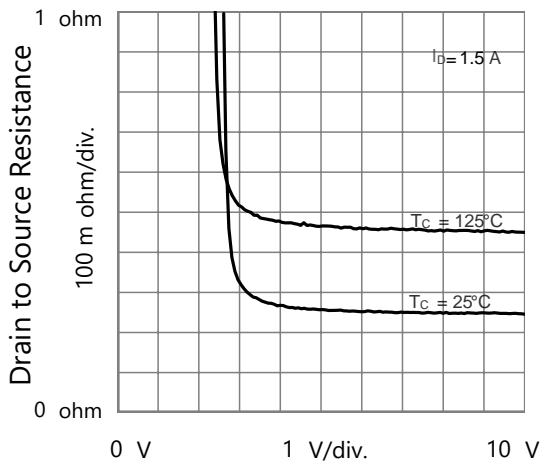
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



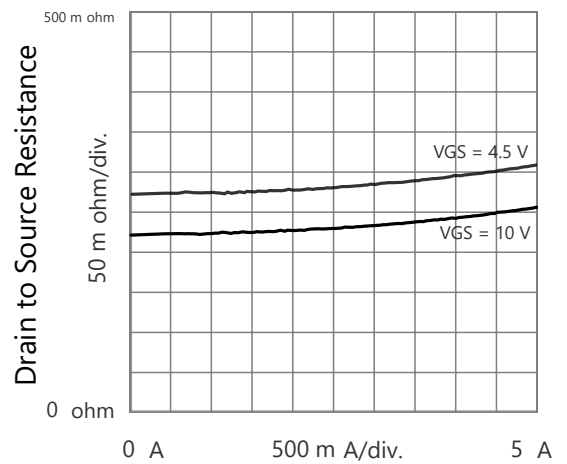
Drain to Source Voltage
Output Characteristics



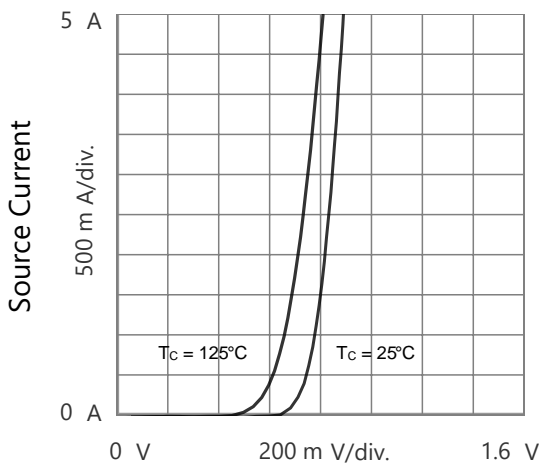
Gate to Source Voltage
Transfer Characteristics



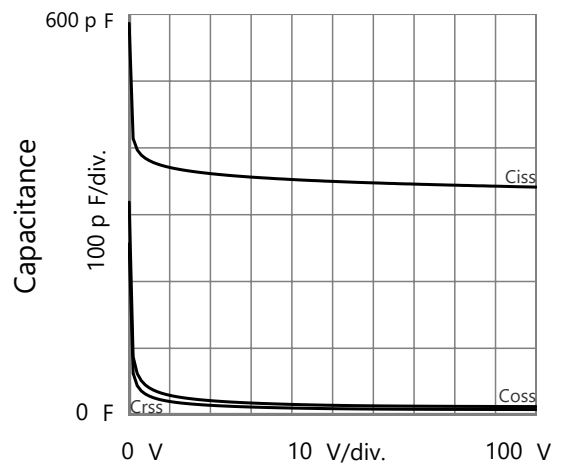
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

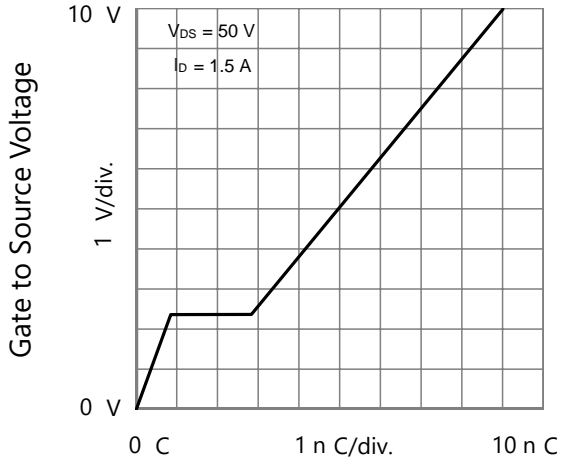


Source to Drain Voltage
Body Diode Forward Characteristics

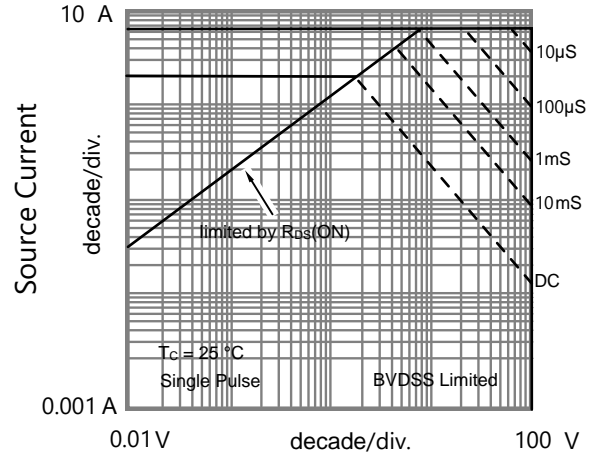


Drain to Source Voltage
Capacitances

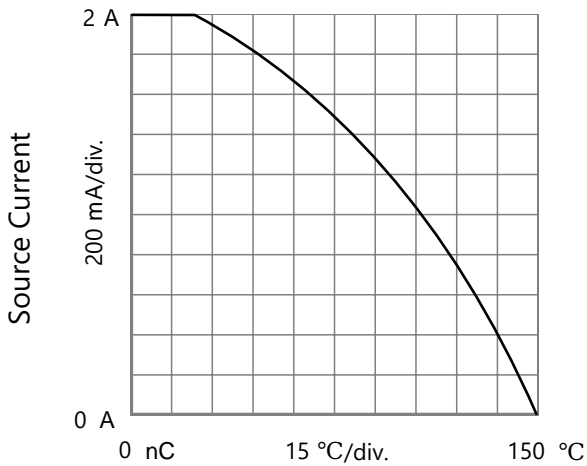
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



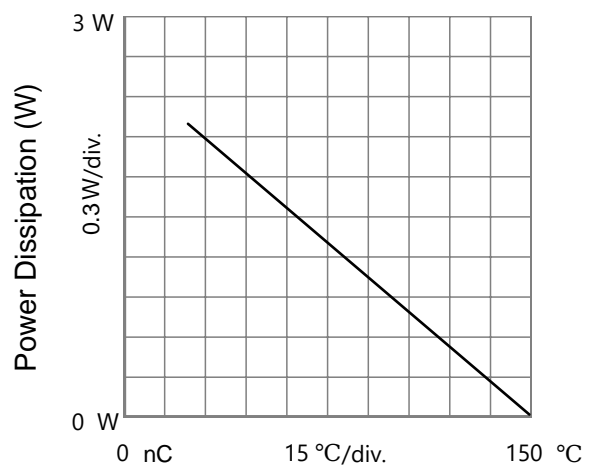
Gate Charge
Gate to Source Voltage vs. Gate Charge



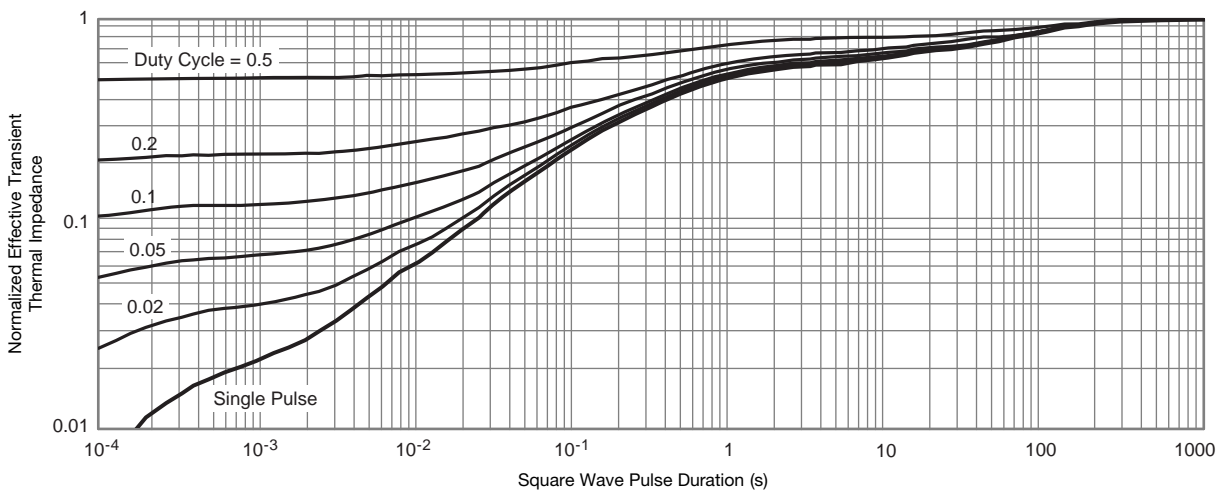
Source to Drain Voltage
Safe Operating Area, Junction-to-Ambient



T_C - Case Temperature



T_C - Case Temperature



Normalized Thermal Transient Impedance, Junction-to-Case

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