N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
100	15 at V_{GS} = 10 V	40

FEATURES

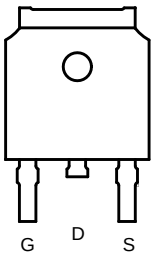
- DT-Trench II Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package

Available
RoHS* COMPLIANT

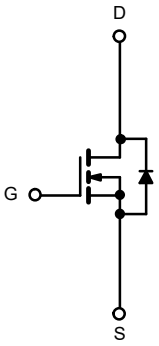
APPLICATION

- DC-DC Conversion

TO-252



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_C = 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 = 175 °C)	T_C = 25 °C	I_D	40	A
	T_C = 100 °C		36	
Pulsed Drain Current		I_{DM}	120	
Avalanche Current		I_{AS}	38	
Single Avalanche Energy[a]	L = 0.1 mH	E_{AS}	139	mJ
Maximum Power Dissipation[a]	T_C = 25 °C	P_D	118[b]	W
	T_A = 25 °C[c]		4.5	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Limit**	**Unit**
Junction-to-Ambient	(PCB Mount)[c]	R_{thJA}	38	°C/W
Junction-to-Case (Drain)		R_{thJC}	1.9	

Notes:
a. Duty cycle ≤ 1 %.
b. See SOA curve for voltage derating.
c. When Mounted on 1" square PCB (FR-4 material).

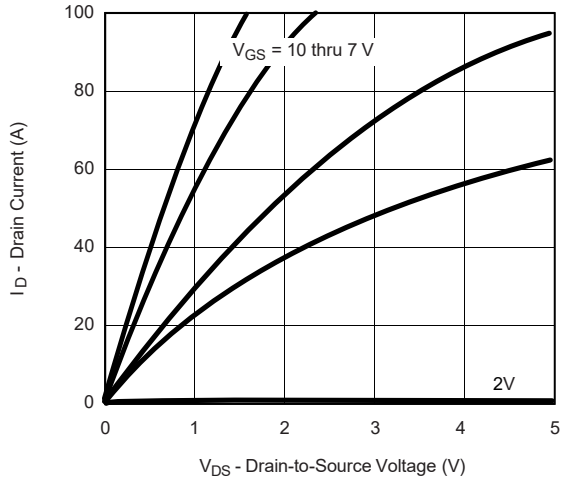
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{SS} = 0 V, I_D = 250 µA	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.5		3.8	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 175 °C			250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	40			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D =10 A		15	22	mΩ
		V_{GS} = 10 V, I_D = 10 A, T_J = 125 °C			36	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 10 A		28		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz		1268		pF
Output Capacitance	C_{oss}			277		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge[c]	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 10 A		16		nC
Gate-Source Charge[c]	Q_{gs}			7		
Gate-Drain Charge[c]	Q_{gd}			5		
Gate Resistance	R_G			0.5		Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 50 V, R_L = 1.25 Ω I_D ≅ 10 A, V_{GEN} = 10 V, R_G = 5 Ω		10		ns
Rise Time[c]	t_r			4		
Turn-Off Delay Time[c]	$t_{d(off)}$			19		
Fall Time[c]	t_f			5		
Source-Drain Diode Ratings and Characteristics T_C = 25 °C[b]						
Continuous Current	I_S				40	A
Pulsed Current	I_{SM}				120	
Forward Voltage[a]	V_{SD}	I_S = 3 A, V_{GS} = 0 V		0.7	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 10 A, di/dt = 100 A/µs		50		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			39		A
Reverse Recovery Charge	Q_{rr}			52		nC

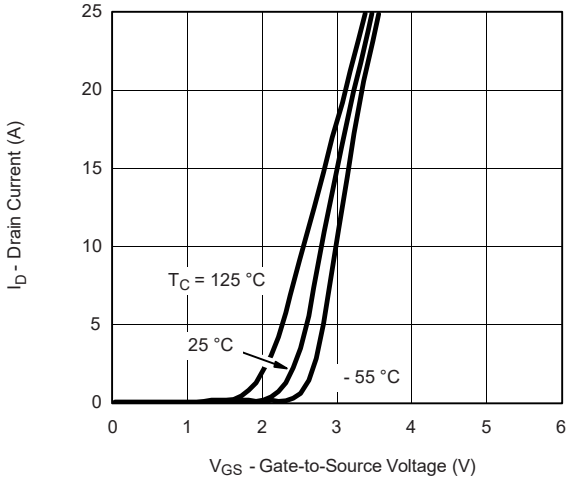
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

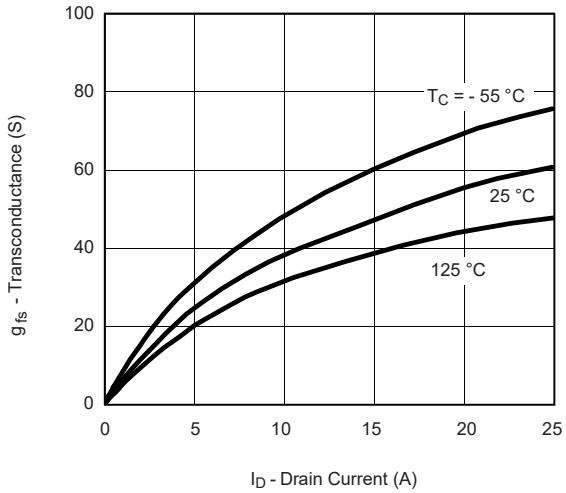
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



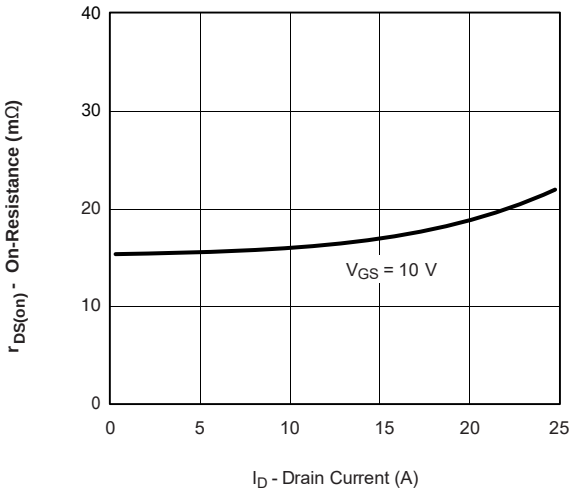
Output Characteristics



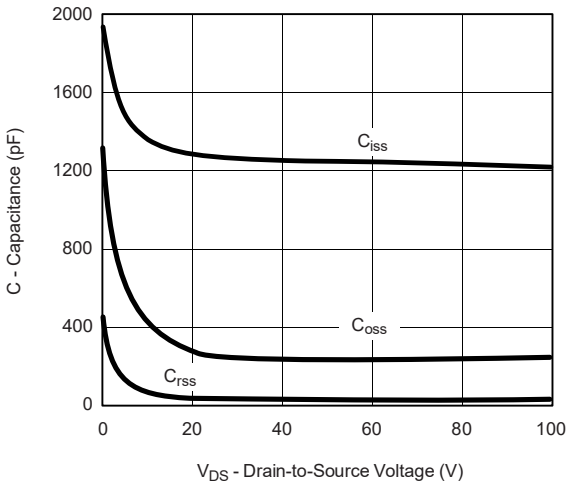
Transfer Characteristics



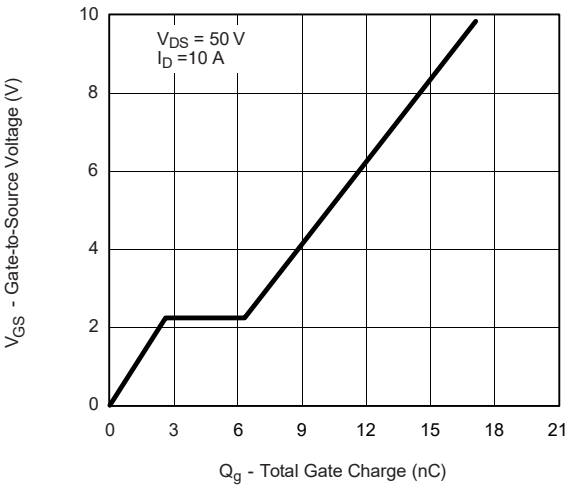
Transconductance



On-Resistance vs. Drain Current

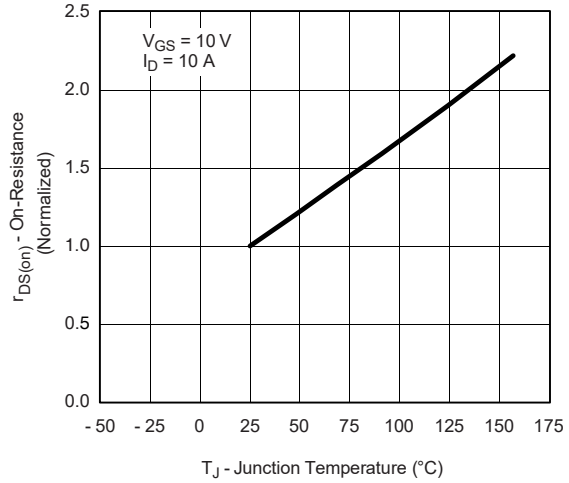


Capacitance

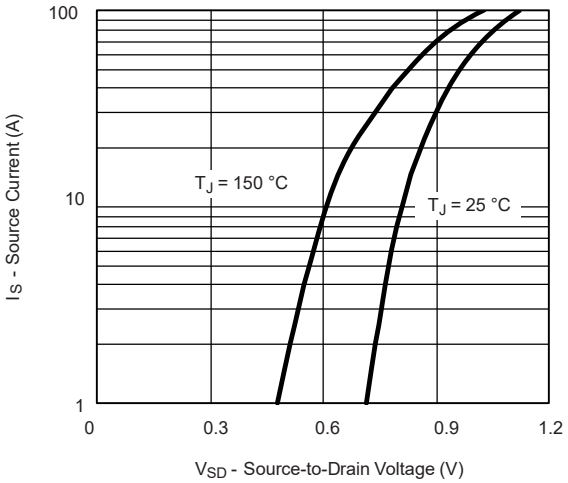


Gate Charge

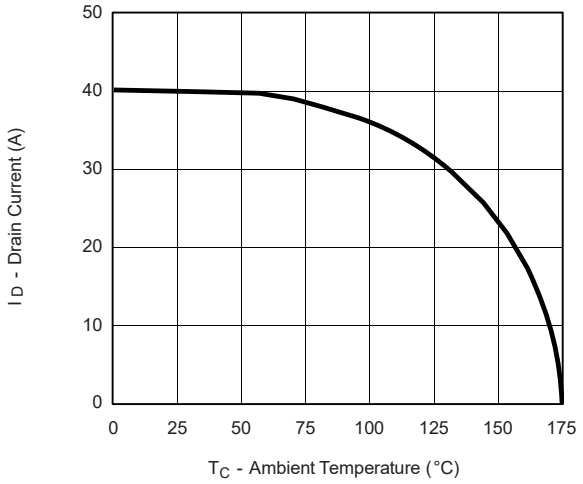
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



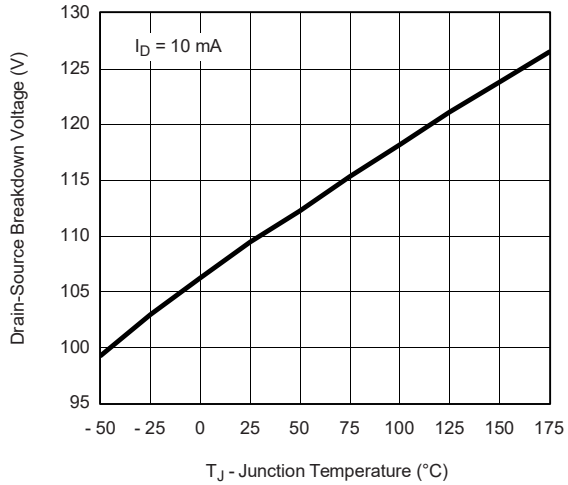
On-Resistance vs. Junction Temperature



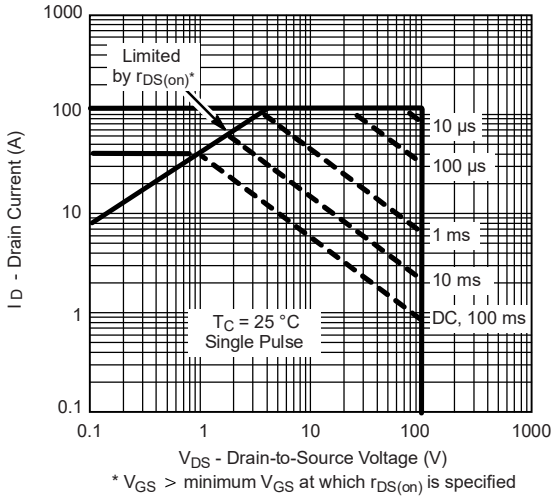
Source-Drain Diode Forward Voltage



Maximum Avalanche and Drain Current vs. Case Temperature

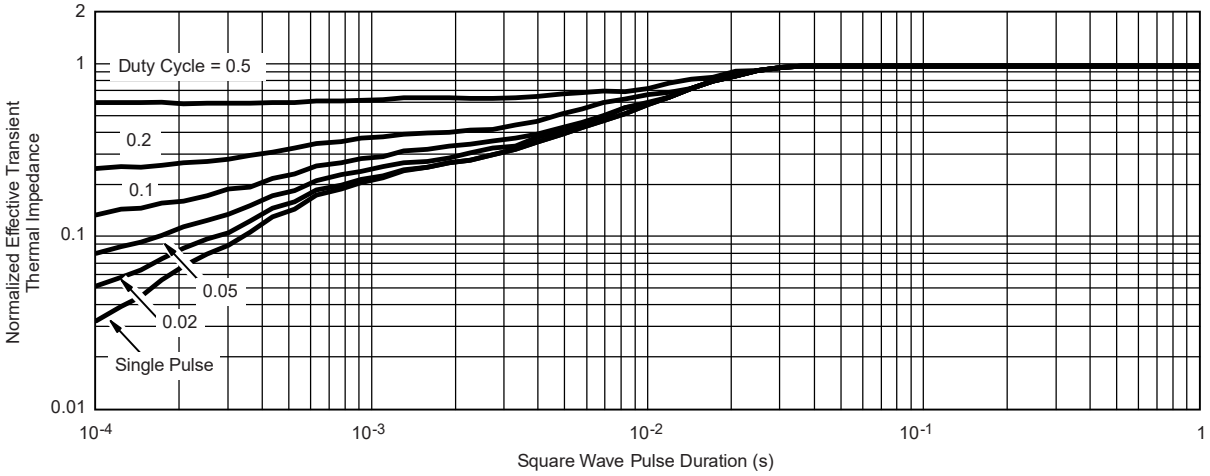


Drain-Source Breakdown Voltage vs. Junction Temperature



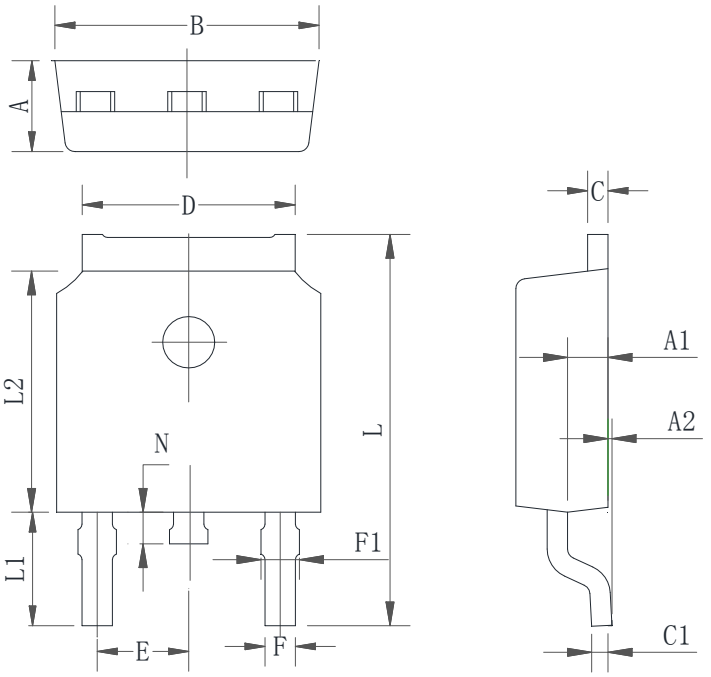
Safe Operating Area

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



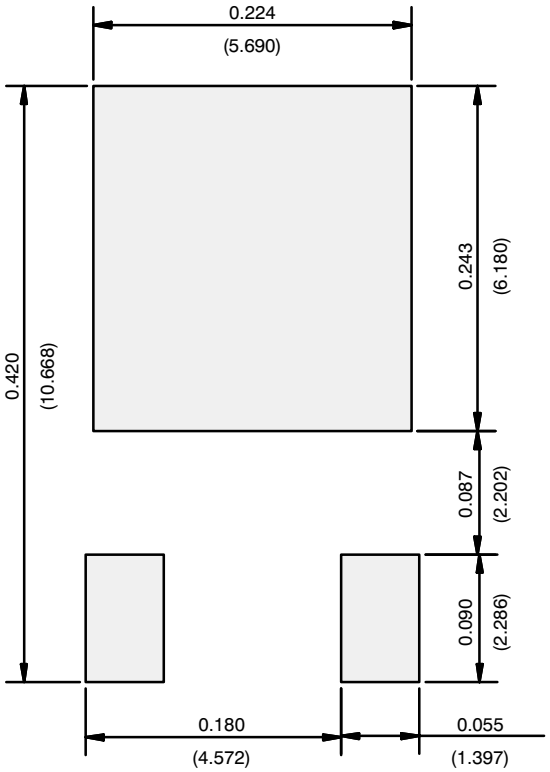
Normalized Thermal Transient Impedance, Junction-to-Case

TO-252 CASE OUTLINE



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E		2.286 TYP	
F	0.66	0.76	0.86
F1	0.66	0.86	1.06
L	9.60	9.90	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
N	0.60	0.80	1.00

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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