N-Channel 180 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
180	0.042 at V_{GS} = 10 V	35

FEATURES

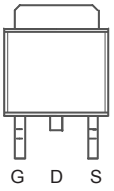
- DT-Trench Power MOSFET
- 100 % R_g and IS Tested

RoHS COMPLIANT

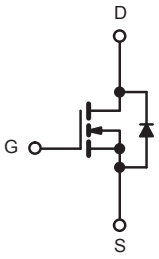
APPLICATIONS

- Primary Side Switch

TO-252



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	180	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 175 °C)[b]	T_C = 25 °C	I_D	35	A
	T_C = 125 °C		19	
Pulsed Drain Current		I_{DM}	140	
Continuous Source Current (Diode Conduction)		I_S	30	
Avalanche Current		I_{AS}	30	
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	24	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	85[b]	W
	T_A = 25 °C		6[a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient[a]	t ≤ 10 s	R_{thJA}	13	18	°C/W
	Steady State		27	50	
Junction-to-Case (Drain)		R_{thJC}	0.85	1.1	

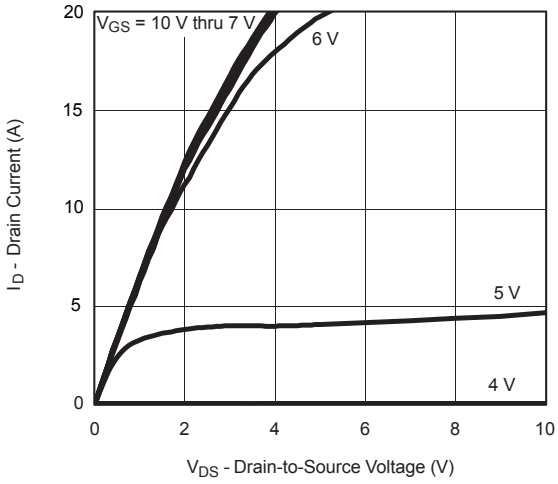
Notes:
a. Surface mounted on 1" x 1" FR4 board.
b. See SOA curve for voltage derating.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.[a]**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 uA	180			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	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} = 145 V, V_{GS} = 0 V			1	uA
		V_{DS} = 145 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 145 V, V_{GS} = 0 V, T_J = 175 °C			250	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	35			A
Drain-Source On-State Resistance[b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A		0.042	0.046	Ω
Forward Transconductance[b]	g_{fs}	V_{DS} = 145 V, I_D =10A		16		S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 145 V, F = 1 MHz		6750		pF
Output Capacitance	C_{oss}			1250		
Reverse Transfer Capacitance	C_{rss}			180		
Total Gate Charge[c]	Q_g	V_{DS} = 145 V, V_{GS} = 10 V, I_D =10 A		15		nC
Gate-Source Charge[c]	Q_{gs}			8		
Gate-Drain Charge[c]	Q_{gd}			12		
Gate Resistance	R_g		1.2		2.9	Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 145 V, R_L = 5.2 Ω I_D ≅ 10 A, V_{GEN} = 10 V, R_g = 2.5 Ω		11	27	ns
Rise Time[c]	t_r			34	76	
Turn-Off Delay Time[c]	$t_{d(off)}$			22	48	
Fall Time[c]	t_f			45	90	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Continous Source-Drain Diode Current	I_S	T_C = 25 °C			30	A
Pulsed Current	I_{SM}				140	
Diode Forward Voltage[b]	V_{SD}	I_F = 19 A, V_{GS} = 0 V		0.7	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 19 A, dI/dt = 100 A/òs		160	250	ns

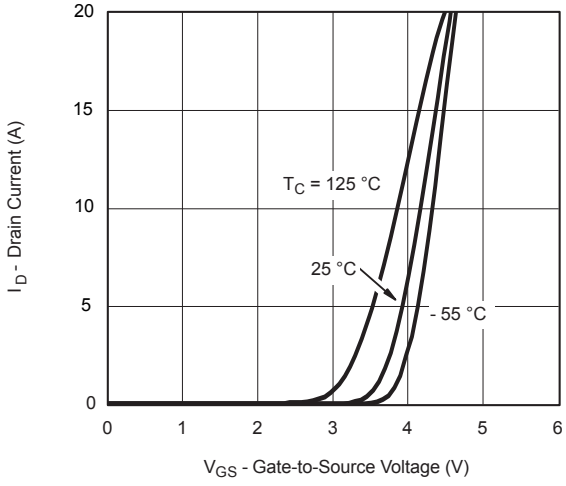
Notes:
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 òs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

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.

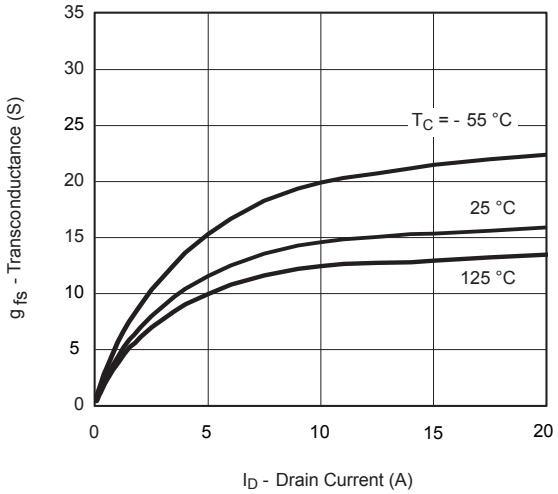
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



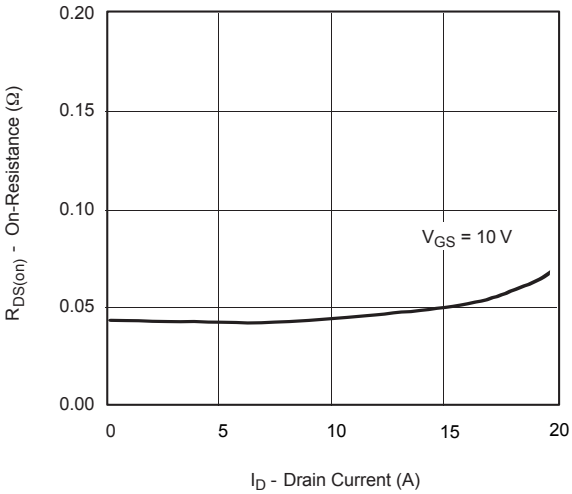
Output Characteristics



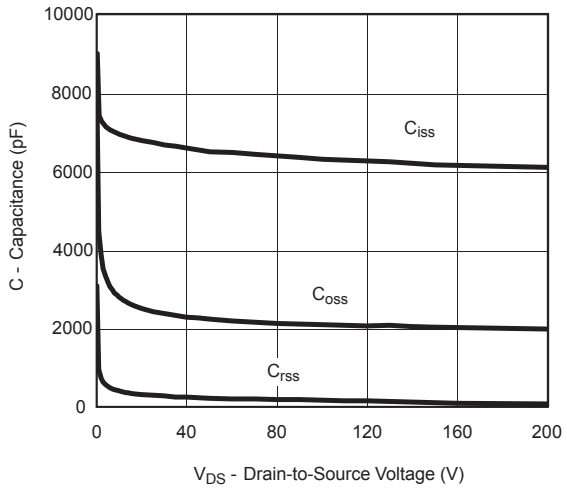
Transfer Characteristics



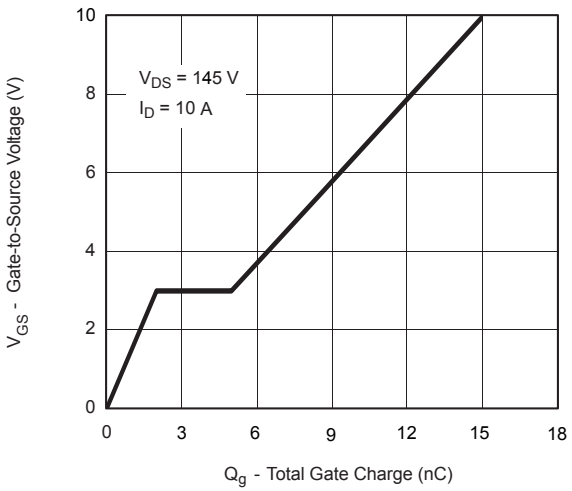
Transconductance



On-Resistance vs. Drain Current

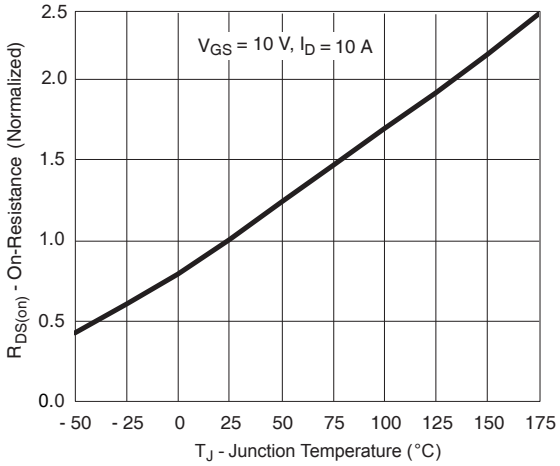


Capacitance

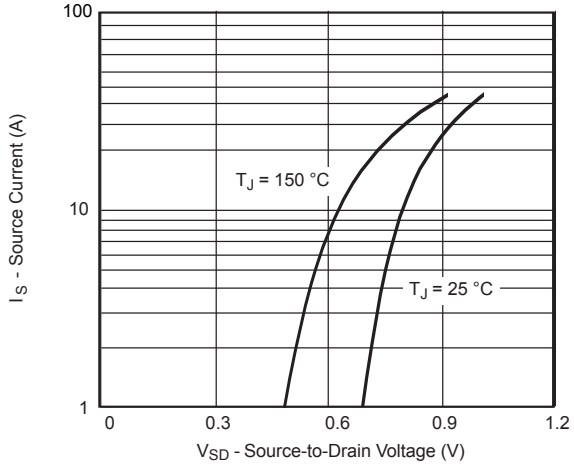


Gate Charge

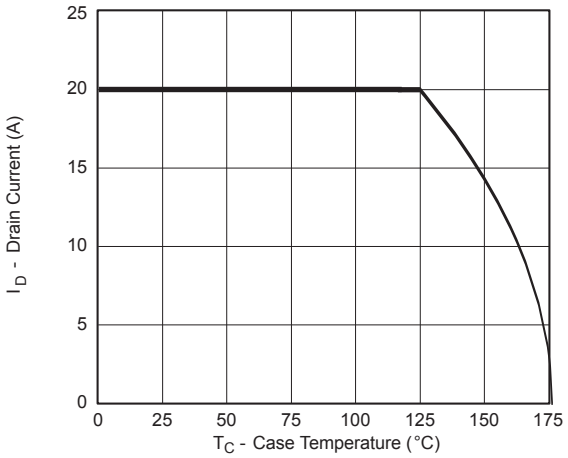
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



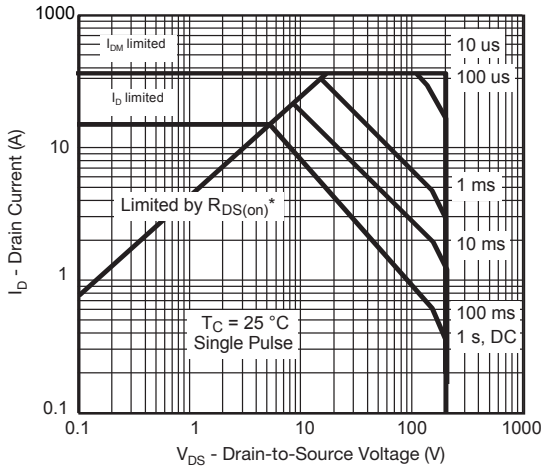
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

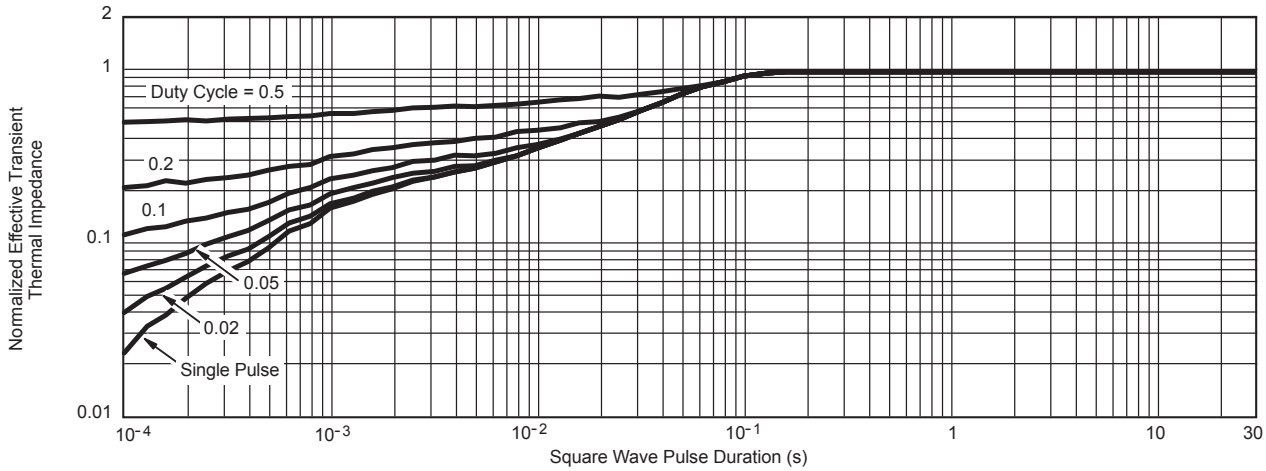


Maximum Avalanche Drain Current vs. Case Temperature



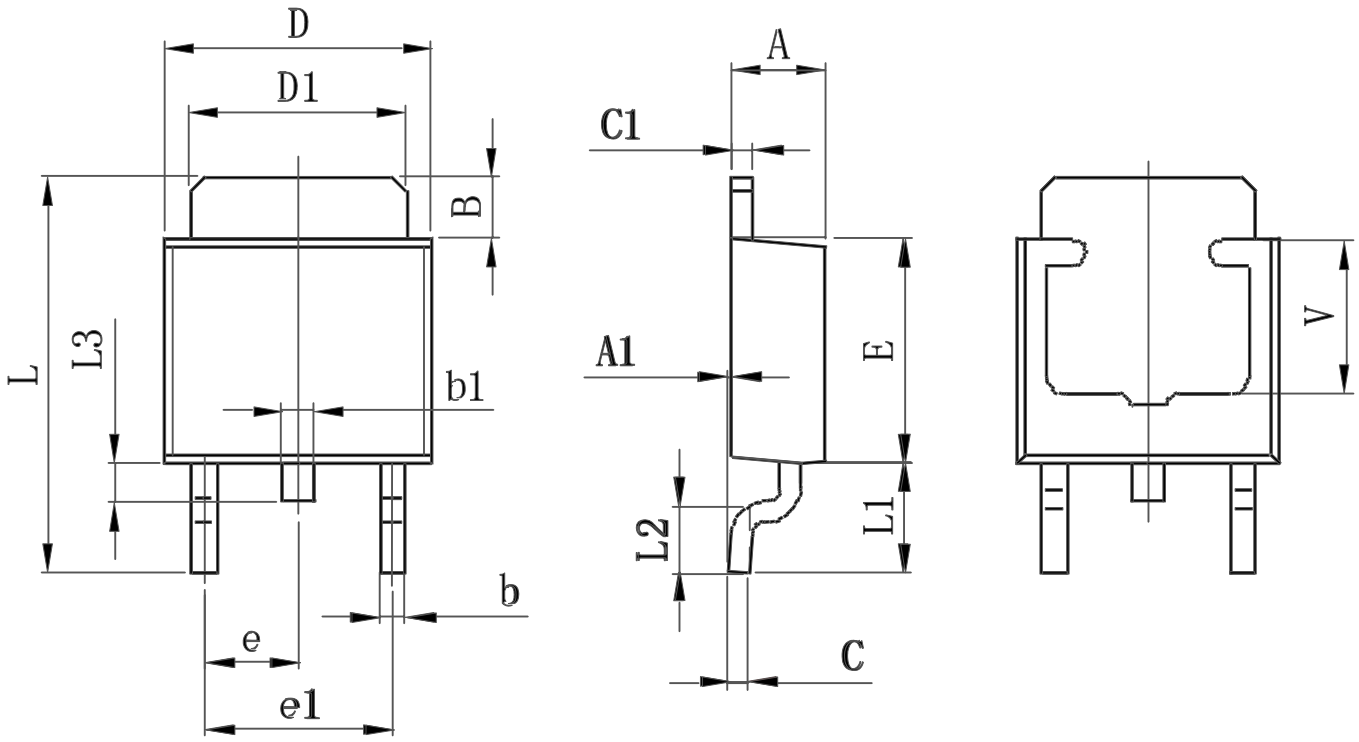
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



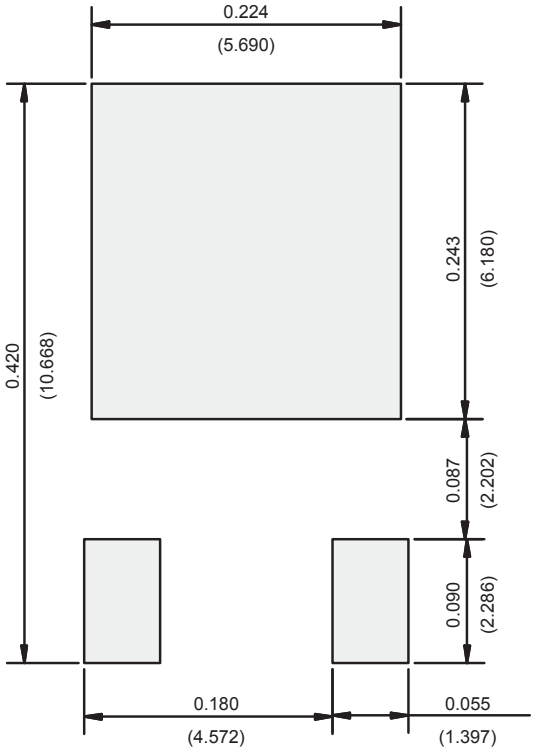
Normalized Thermal Transient Impedance, Junction-to-Case

TO-252-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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