N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
100	0.026 at V_{GS} = 10 V	11
	0.140 at V_{GS} = 3-4 V	1/

FEATURES

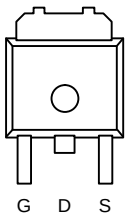
- TrenchFET® Power MOSFETS
- 175 °C Junction Temperature
- 100 % R_g Tested

RoHS COMPLIANT

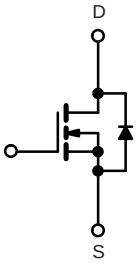
APPLICATIONS

- Primary Side Switch

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)[b]	T_C = 25 °C	I_D	11	A
	T_C = 125 °C		6.1	
Pulsed Drain Current		I_{DM}	41	
Continuous Source Current (Diode Conduction)		I_S	11	
Avalanche Current		I_{AR}	1/	
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E_{AR}	1/ .0	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	6/ [b]	W
	T_A = 25 °C		2.4[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}	16	22	°C/W
	Steady State		45	57	
Junction-to-Case		R_{thJC}	2	2.4	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

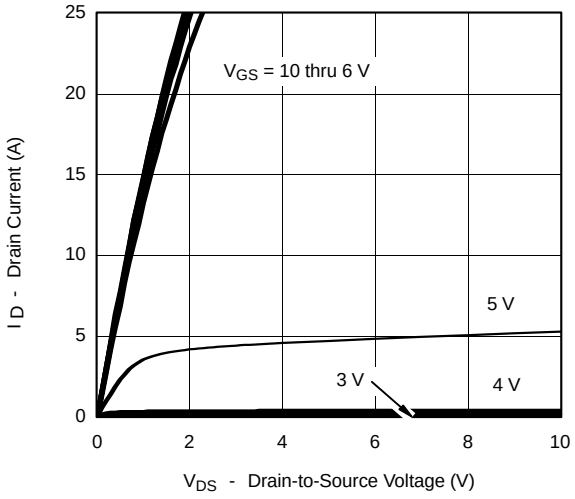
b. See SOA curve for voltage derating.

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 µA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	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} = 100 V, V_{GS} = 0 V			1	µA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 100 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	15			A
Drain-Source On-State Resistance[b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 6 A		0.137	0.149	Ω
		V_{GS} = 10 V, I_D = 6 A, T_J = 125 °C		0.190	0.209	
		V_{GS} = 10 V, I_D = 6A, T_J = 175 °C		0.250	0.276	
		V_{GS} = 4.5 V, I_D = 3 A		0.151	0.167	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 6 A		25		S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		852		pF
Output Capacitance	C_{oss}			106		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge[c]	Q_g	V_{DS} = 75 V, V_{GS} = 10 V, I_D = 12 A		20	23	nC
Gate-Source Charge[c]	Q_{gs}			5.2		
Gate-Drain Charge[c]	Q_{gd}			7		
Gate Resistance	R_g		1		3.2	Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 75 V, R_L = 5 Ω I_D ≅ 12 A, V_{GEN} = 10 V, R_G = 2.5 Ω		8	12	ns
Rise Time[c]	t_r			35	55	
Turn-Off Delay Time[c]	$t_{d(off)}$			17	25	
Fall Time[c]	t_f			30	45	
Source-Drain Diode Ratings and Characteristic (T_C = 25 °C)						
Pulsed Current	I_{SM}				12	A
Diode Forward Voltage[b]	V_{SD}	I_F = 12 A, V_{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 12 A, dI/dt = 100 A/µs		55	85	ns

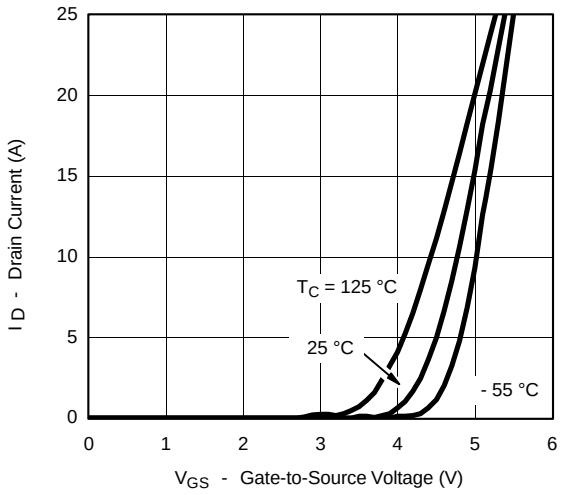
Notes:
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

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.

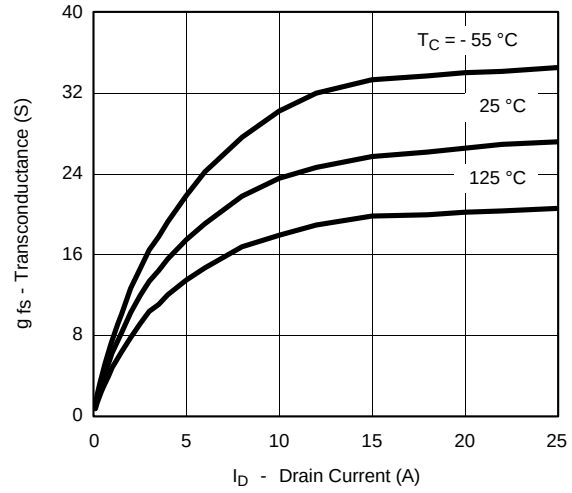
TYPICAL CHARACTERISTICS (25 °C unless noted)



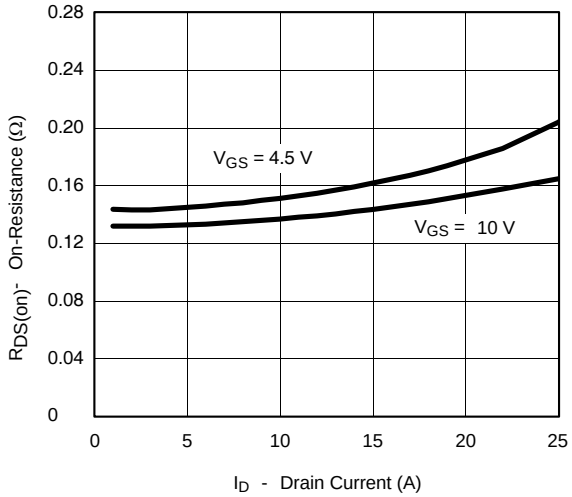
Output Characteristics



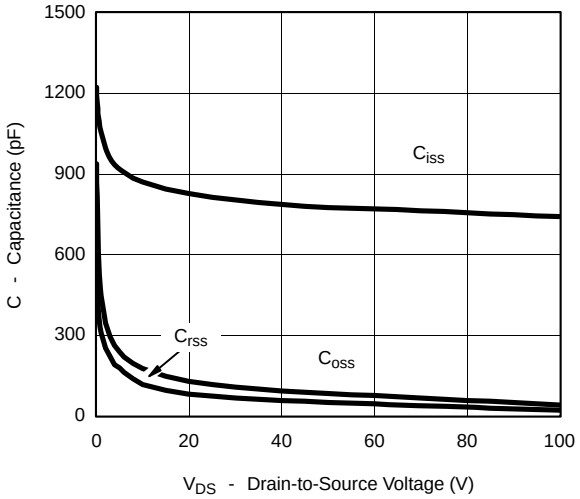
Transfer Characteristics



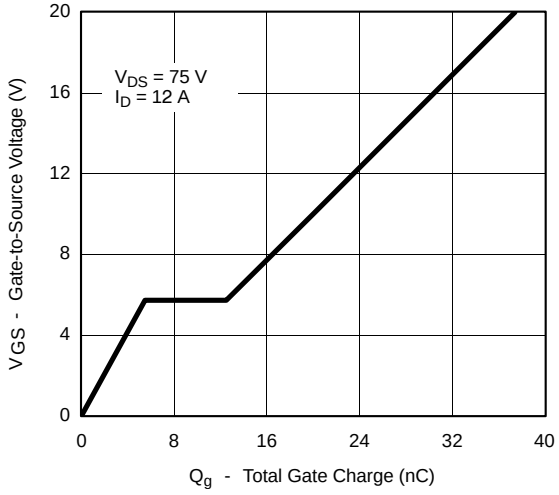
Transconductance



On-Resistance vs. Drain Current

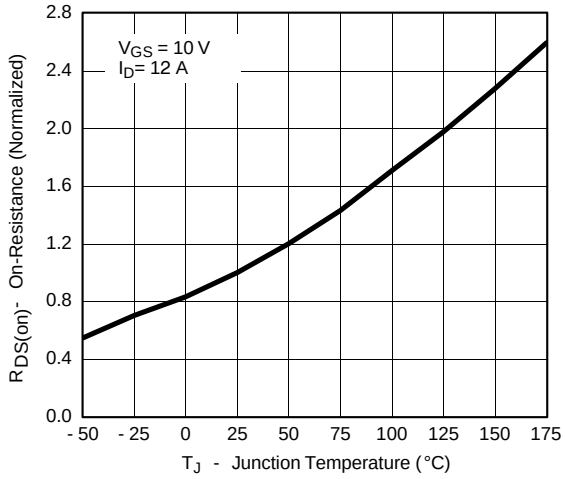


Capacitance

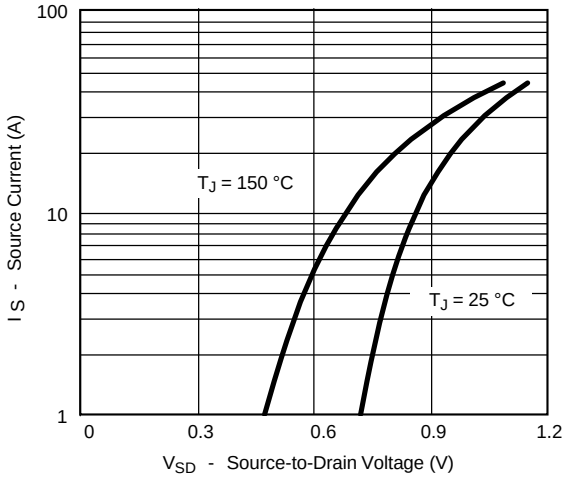


Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

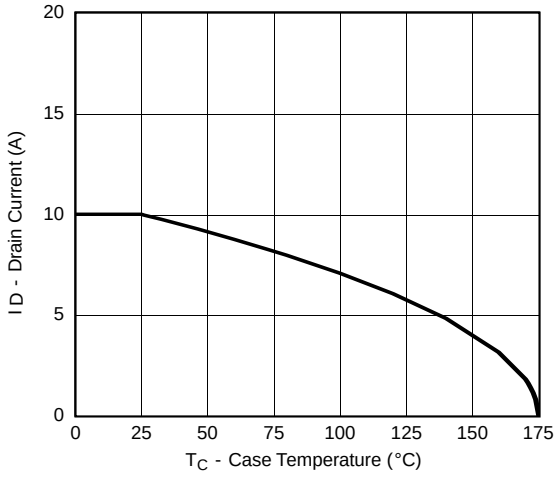


On-Resistance vs. Junction Temperature

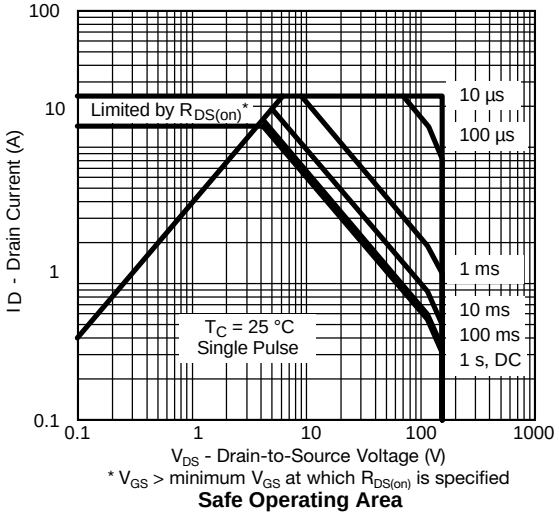


Source-Drain Diode Forward Voltage

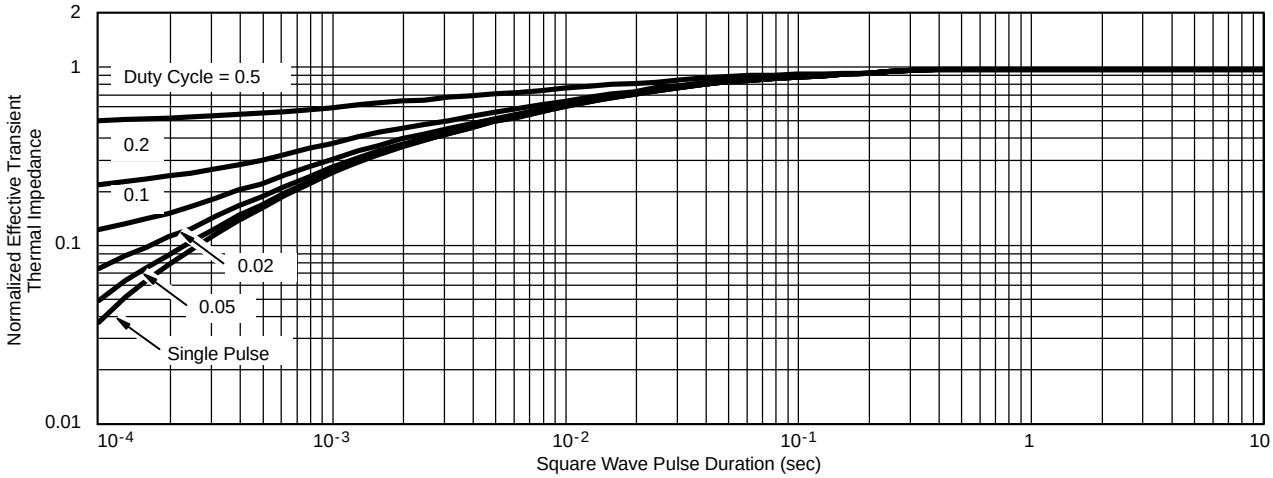
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature

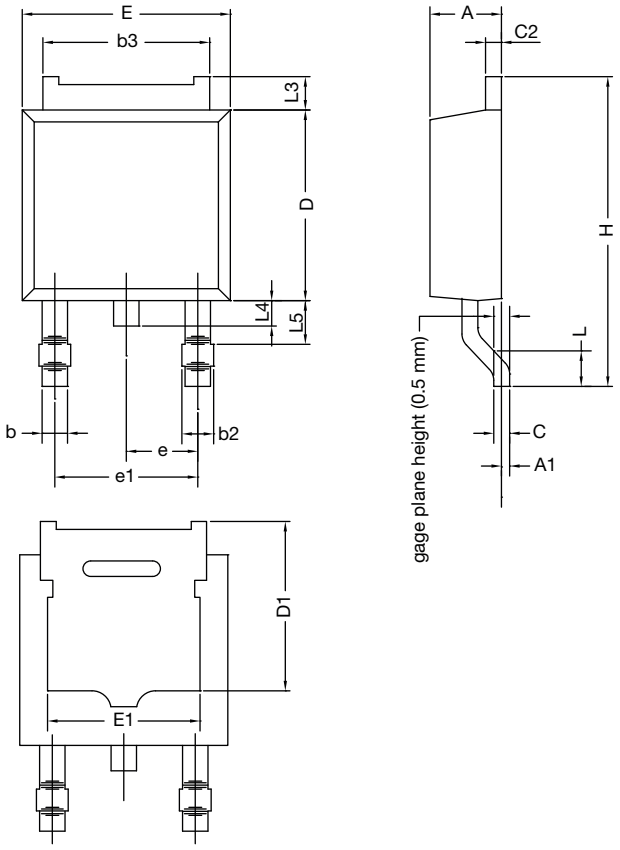


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

TO-252AA CASE OUTLINE

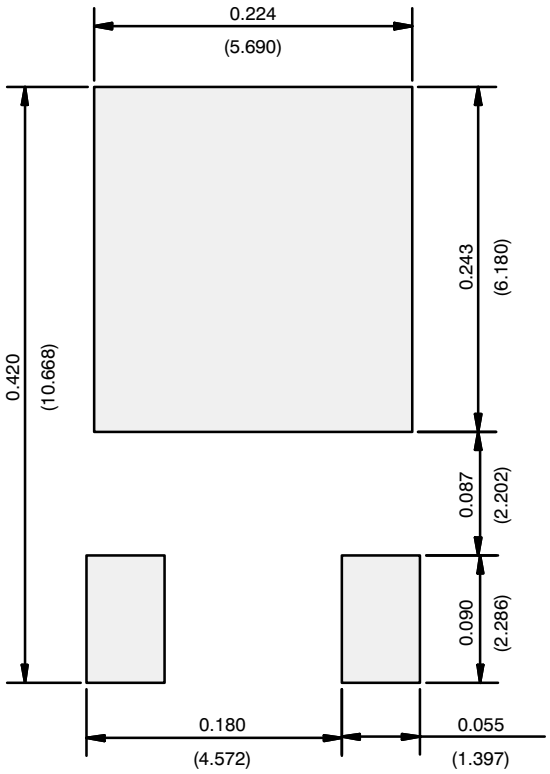


	MILLIMETERS		INCHES	
DIM.	**MIN.**	**MAX.**	**MIN.**	**MAX.**
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060
ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347				

Note

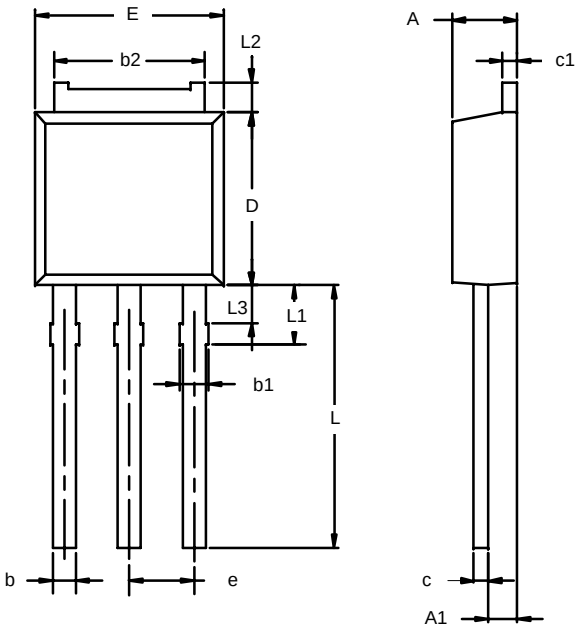
- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

TO-251AA (DPAK)



Note: Dimension L3 is for reference only.

Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	2.21	2.38	0.087	0.094
A1	0.89	1.14	0.035	0.045
b	0.71	0.89	0.028	0.035
b1	0.76	1.14	0.030	0.045
b2	5.23	5.43	0.206	0.214
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.48	6.73	0.255	0.265
e	2.28 BSC		0.090 BSC	
L	8.89	9.53	0.350	0.375
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060
ECN: S-03946—Rev. E, 09-Jul-01 DWG: 5346				

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