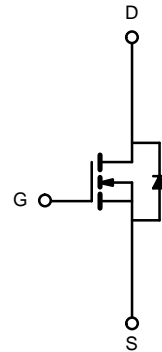
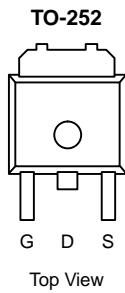


## N-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
60	0.024@ $V_{GS} = 10$ V	40

### FEATURES

- DT-Trench Power MOSFET
- 175°C Maximum Junction Temperature
- 100%  $R_g$  Tested



N-Channel MOSFET

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	60	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>b</sup>	$I_D$	$T_C = 25^\circ\text{C}$	40	
		$T_C = 125^\circ\text{C}$	30	
Pulsed Drain Current	$I_{DM}$	120	A	
Continuous Source Current (Diode Conduction)	$I_S$	40		
Avalanche Current	$I_{AR}$	20		
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$ )	$L = 0.1$ mH	$E_{AR}$	80	mJ
Maximum Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	136 <sup>b</sup>	W
		$T_A = 25^\circ\text{C}$	3 <sup>a</sup>	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	15	$^\circ\text{C}/\text{W}$
		Steady State	40	
Junction-to-Case	$R_{thJC}$	0.85	1.1	

Notes

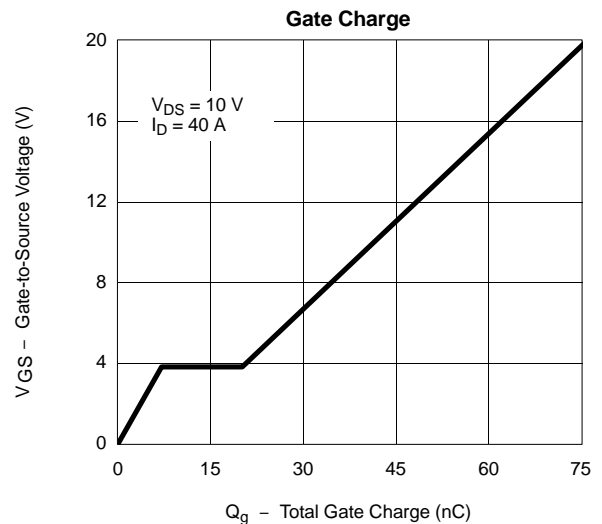
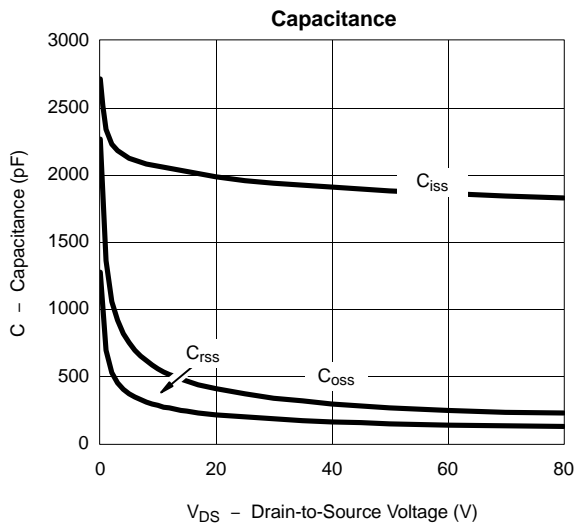
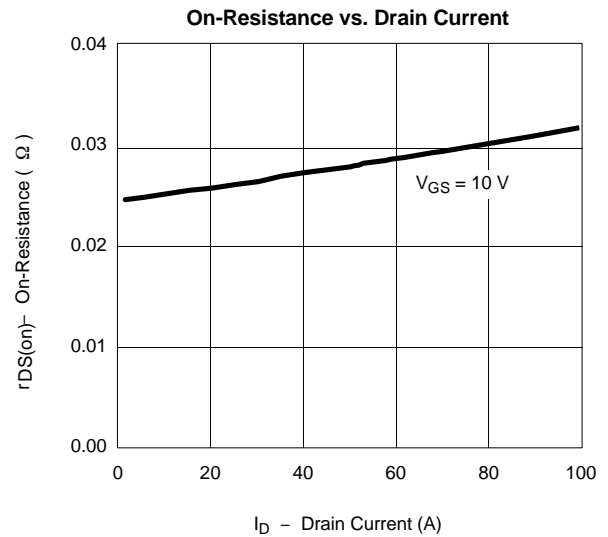
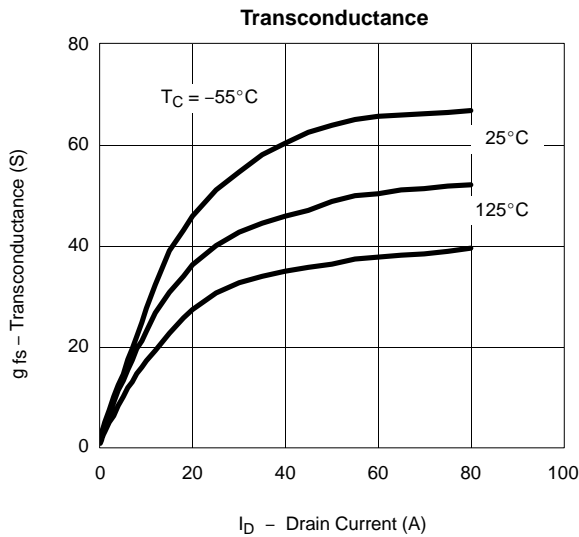
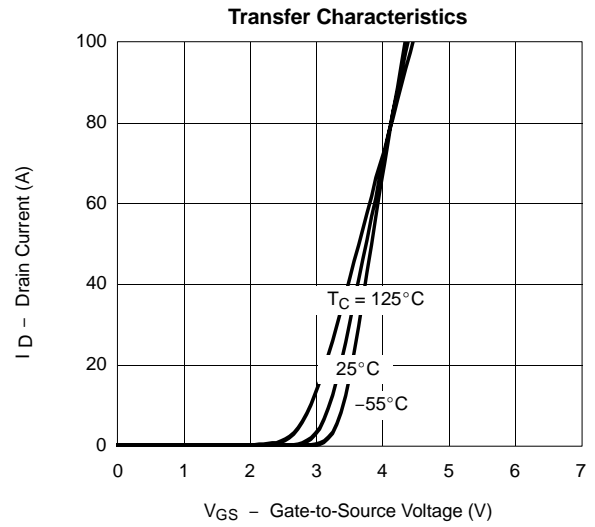
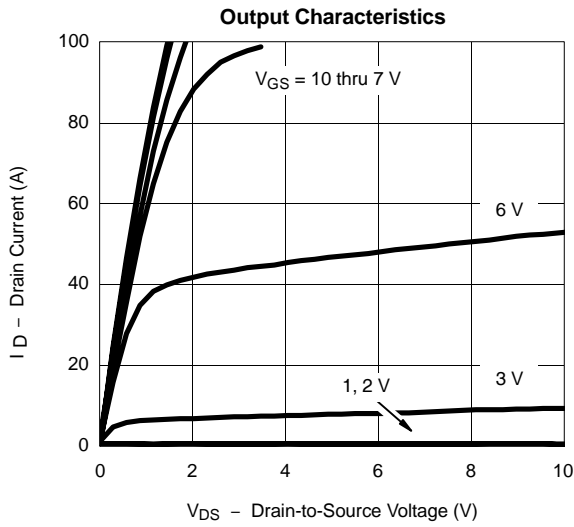
- Surface Mounted on 1" x 1" FR4 Board.
- See SOA curve for voltage derating.

<b>SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)</b>						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.0		3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	40			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 40 A		0.024	0.033	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 40 A, T <sub>J</sub> = 125 °C			0.037	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 40 A, T <sub>J</sub> = 175 °C			0.043	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 40 A		45		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, F = 1 MHz		1960		pF
Output Capacitance	C <sub>oss</sub>			370		
Reverse Transfer Capacitance	C <sub>rss</sub>			200		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 40 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 40 A		42	60	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			7		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			13		
Gate Resistance	R <sub>g</sub>		0.5		2.7	Ω
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 40 V, R <sub>L</sub> = 1.0 Ω I <sub>D</sub> = 40 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 2.5 Ω		12	20	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			52	80	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			25	38	
Fall Time <sup>c</sup>	t <sub>f</sub>			10	15	
<b>Source-Drain Diode Ratings and Characteristic (T<sub>C</sub> = 25 °C)</b>						
Pulsed Current	I <sub>SM</sub>				120	A
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 40 A, V <sub>GS</sub> = 0 V		1.0	1.5	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 40 A, di/dt = 100 A/μs		45	70	ns

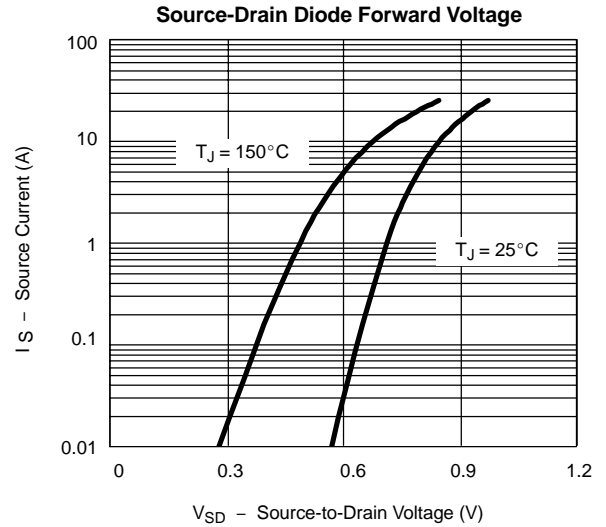
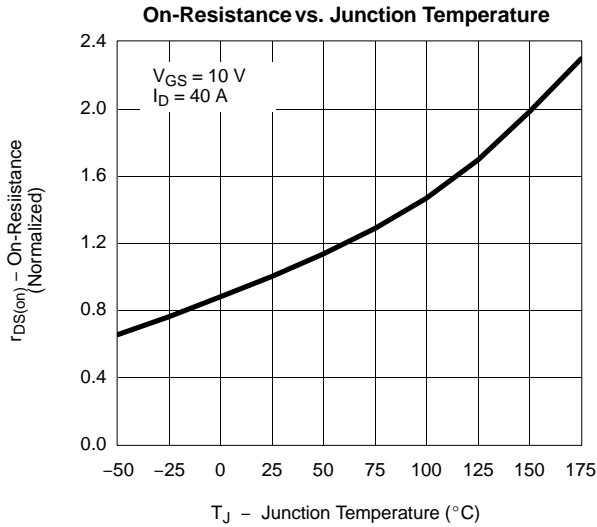
**Notes**

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

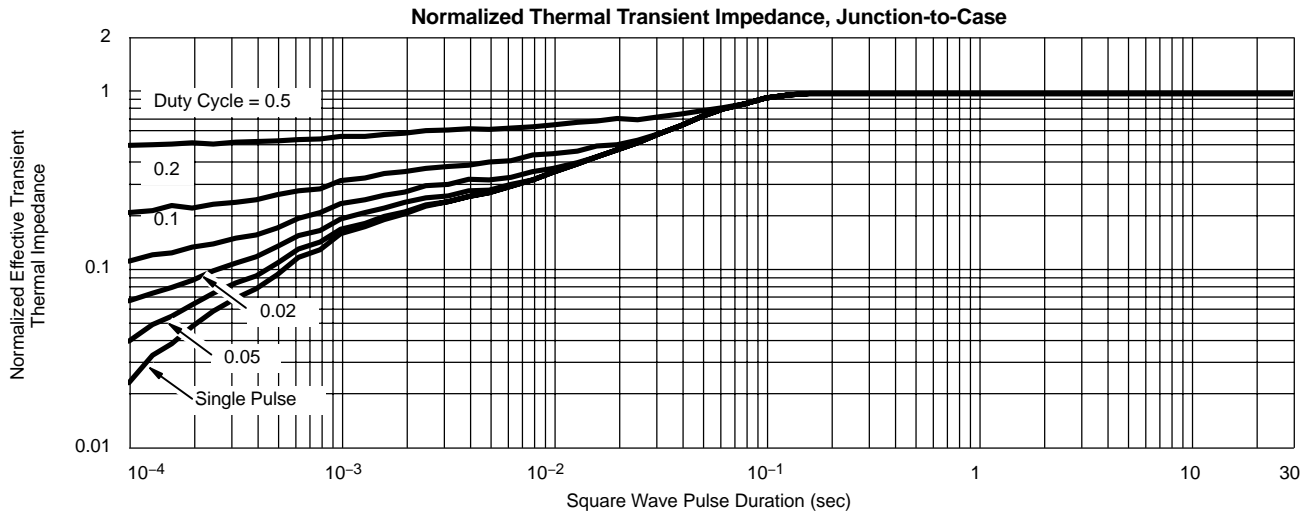
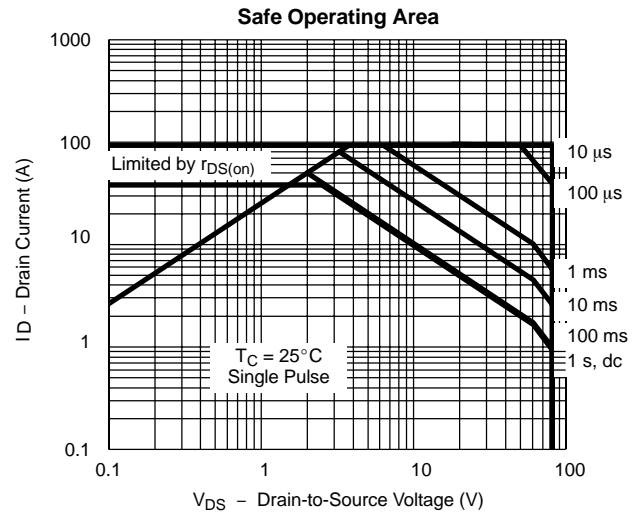
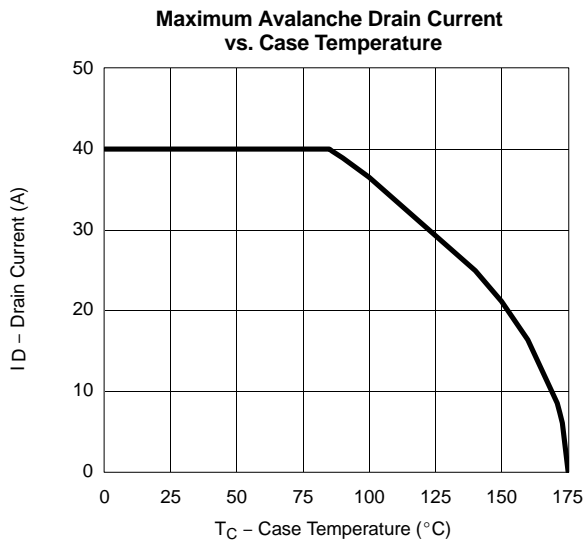
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



**THERMAL RATINGS**



## TO-252AA CASE OUTLINE

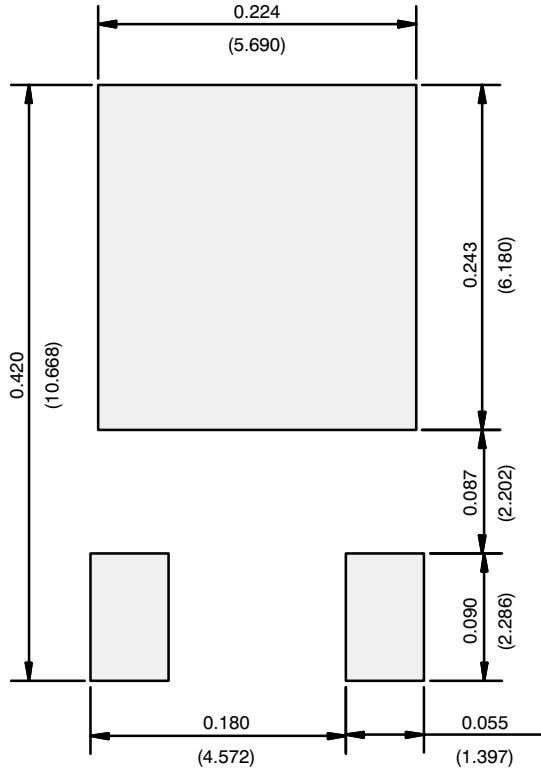


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	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)

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