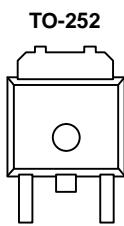


## N-Channel 60 V (D-S) 175 °C MOSFET

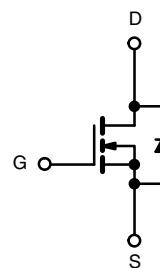
PRODUCT SUMMARY	
$V_{DS}$ (V)	60
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 10$ V	0.0050
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 4.5$ V	0.0120
$I_D$ (A)	97
Configuration	Single

### FEATURES

- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 %  $R_g$  and UIS Tested



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °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	$I_D$	97	A
		56	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	100	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	290	
Single Pulse Avalanche Current	$I_{AS}$	45	mJ
Single Pulse Avalanche Energy		101	
Maximum Power Dissipation <sup>b</sup>	$P_D$	136	W
		45	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to + 175	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	$R_{thJA}$	50	°C/W
Junction-to-Case (Drain)		1.1	

#### Notes

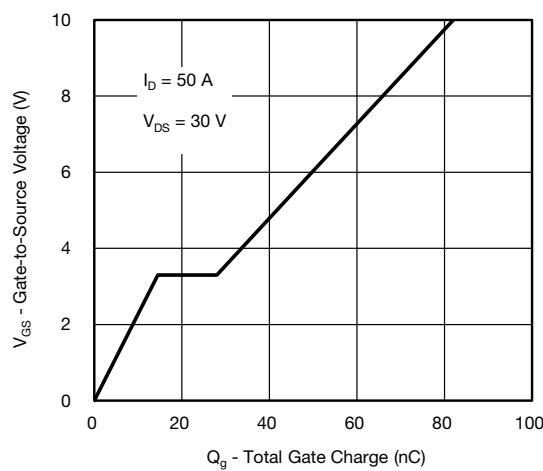
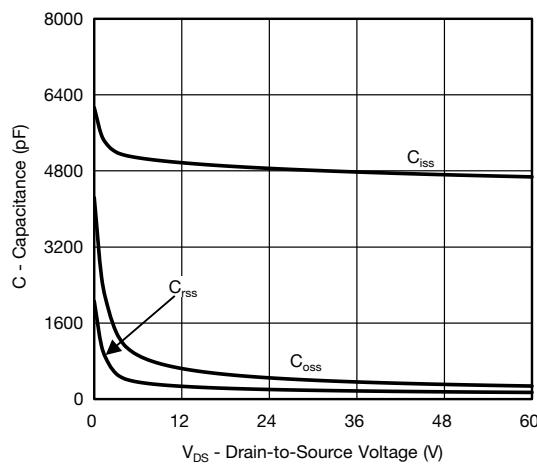
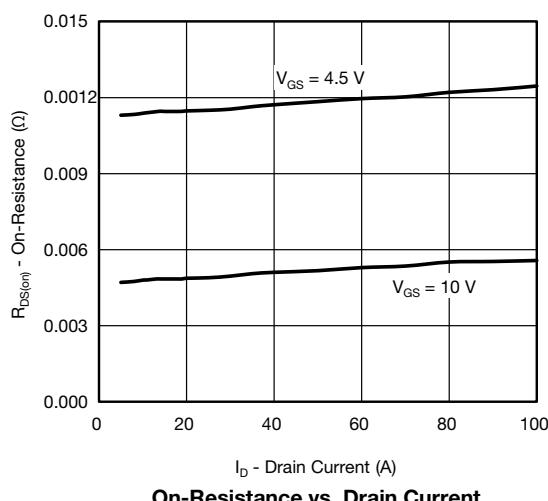
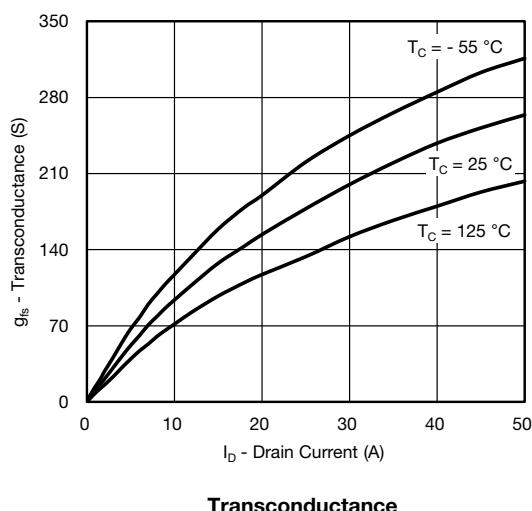
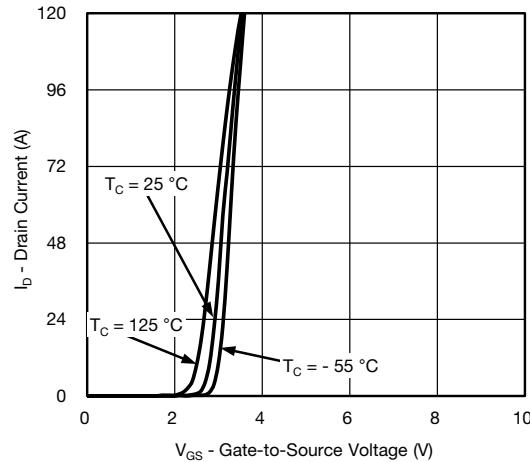
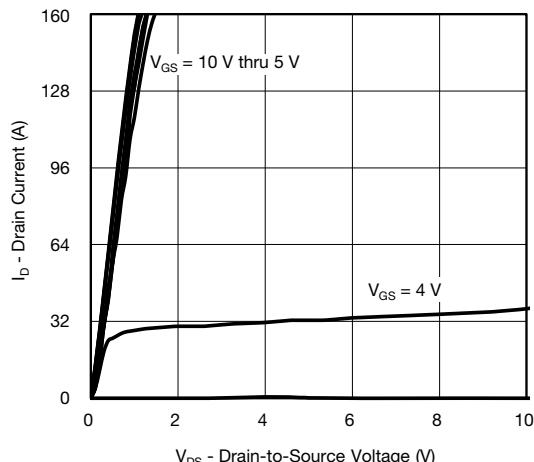
- Package limited.
- Pulse test; pulse width  $\leq 300$   $\mu$ s, duty cycle  $\leq 2$  %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

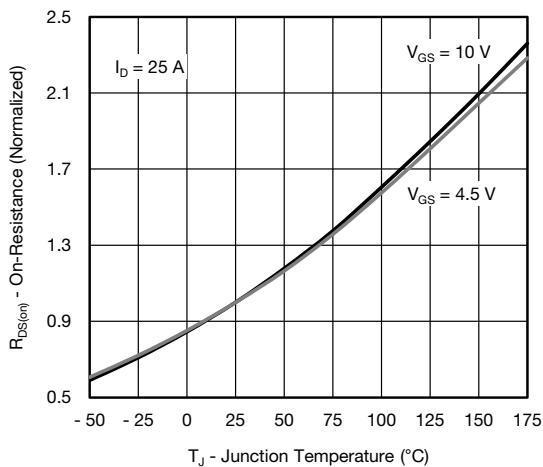
SPECIFICATIONS ( $T_C = 25^\circ\text{C}$ , unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
<b>Static</b>								
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}$ , $I_D = 250\text{ }\mu\text{A}$		60	-	-	V	
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$ , $I_D = 250\text{ }\mu\text{A}$		2.0		4.0		
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 20\text{ V}$		-	-	$\pm 100$	nA	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 60\text{ V}$	-	-	1	$\mu\text{A}$	
		$V_{GS} = 0\text{ V}$	$V_{DS} = 60\text{ V}$ , $T_J = 125^\circ\text{C}$	-	-	50		
		$V_{GS} = 0\text{ V}$	$V_{DS} = 60\text{ V}$ , $T_J = 175^\circ\text{C}$	-	-	150		
On-State Drain Current <sup>a</sup>	$I_{D(\text{on})}$	$V_{GS} = 10\text{ V}$	$V_{DS} \geq 5\text{ V}$	50	-	-	A	
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(\text{on})}$	$V_{GS} = 10\text{ V}$	$I_D = 25\text{ A}$	-	0.0050	-	$\Omega$	
		$V_{GS} = 10\text{ V}$	$I_D = 25\text{ A}$ , $T_J = 125^\circ\text{C}$	-	0.0117	-		
		$V_{GS} = 10\text{ V}$	$I_D = 25\text{ A}$ , $T_J = 175^\circ\text{C}$	-	0.0149	-		
		$V_{GS} = 4.5\text{ V}$	$I_D = 20\text{ A}$	-	0.0120	-		
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}$ , $I_D = 25\text{ A}$		-	177	-	S	
<b>Dynamic<sup>b</sup></b>								
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$	-	4844	6060	pF	
Output Capacitance	$C_{oss}$			-	441	555		
Reverse Transfer Capacitance	$C_{rss}$			-	200	250		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{GS} = 10\text{ V}$	$V_{DS} = 30\text{ V}$ , $I_D = 50\text{ A}$	-	82	125	nC	
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			-	14.5	-		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			-	13.5	-		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		1	2	3	$\Omega$	
Turn-On Delay Time <sup>c</sup>	$t_{d(\text{on})}$	$V_{DD} = 30\text{ V}$ , $R_L = 0.6\text{ }\Omega$ $I_D \approx 50\text{ A}$ , $V_{GEN} = 10\text{ V}$ , $R_g = 1\text{ }\Omega$		-	14	21	ns	
Rise Time <sup>c</sup>	$t_r$			-	5	8		
Turn-Off Delay Time <sup>c</sup>	$t_{d(\text{off})}$			-	41	62		
Fall Time <sup>c</sup>	$t_f$			-	7	11		
<b>Source-Drain Diode Ratings and Characteristics<sup>b</sup></b>								
Pulsed Current <sup>a</sup>	$I_{SM}$			-	-	290	A	
Forward Voltage	$V_{SD}$	$I_F = 50\text{ A}$ , $V_{GS} = 0\text{ V}$		-	0.9	1.5	V	

**Notes**

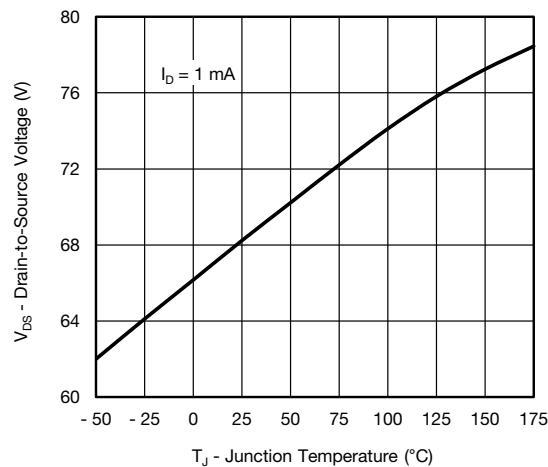
- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\text{ \%}$ .
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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.

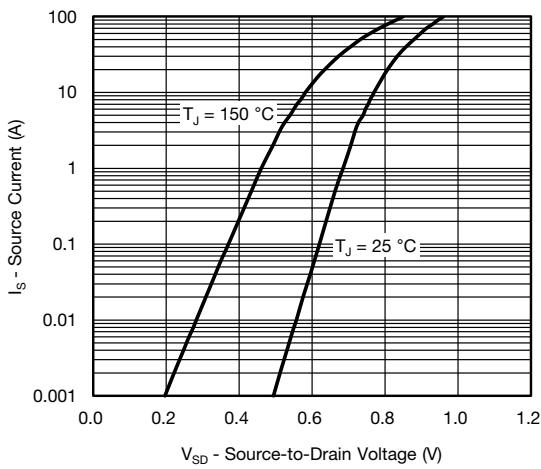
**TYPICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)


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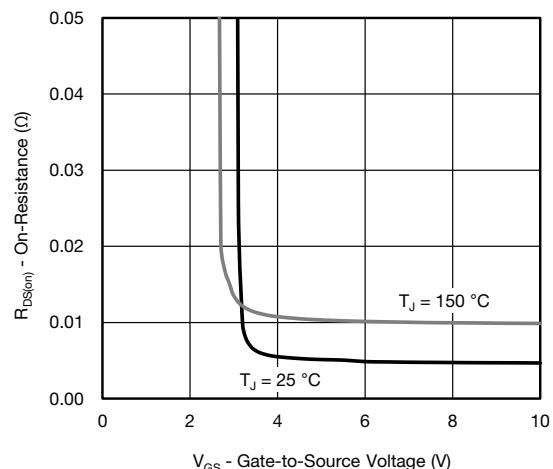
On-Resistance vs. Junction Temperature



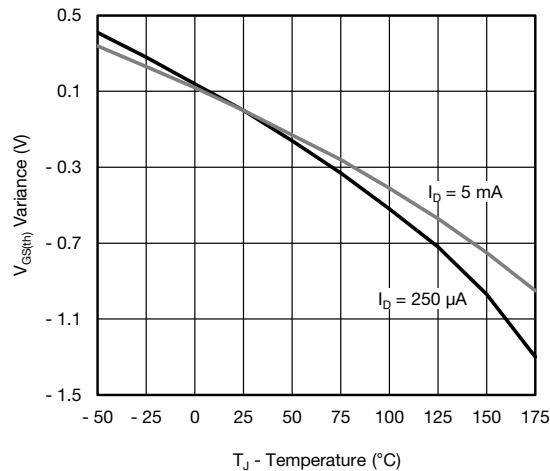
Drain Source Breakdown vs. Junction Temperature



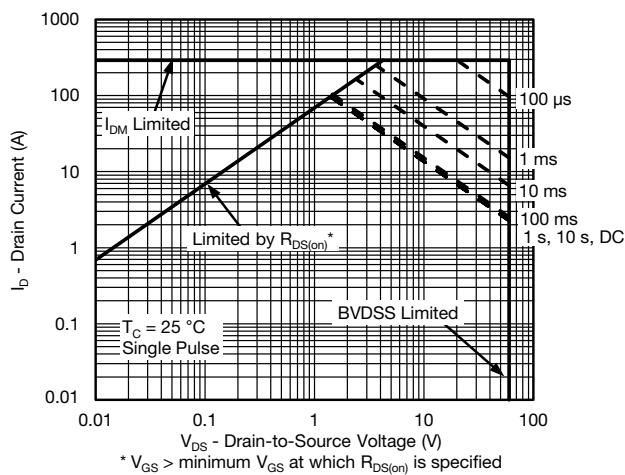
Source Drain Diode Forward Voltage



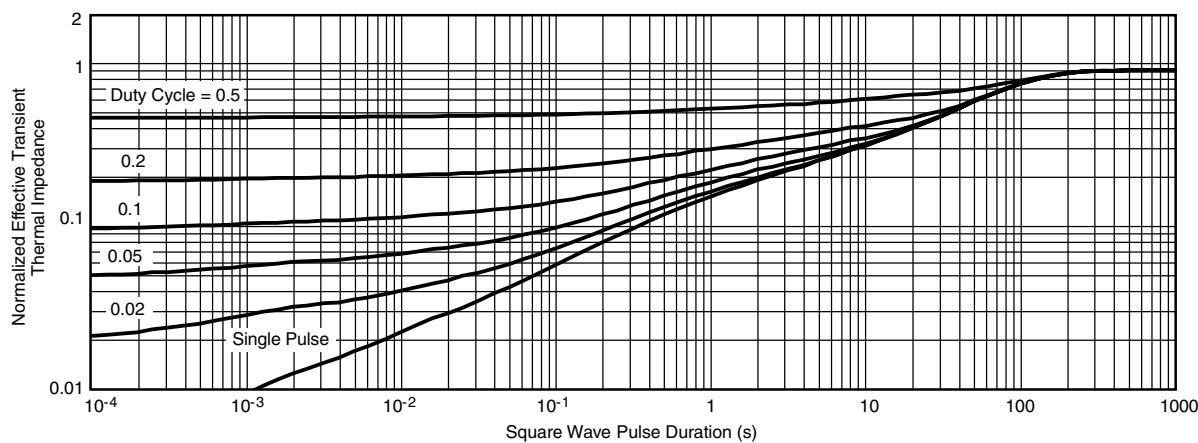
On-Resistance vs. Gate-to-Source Voltage



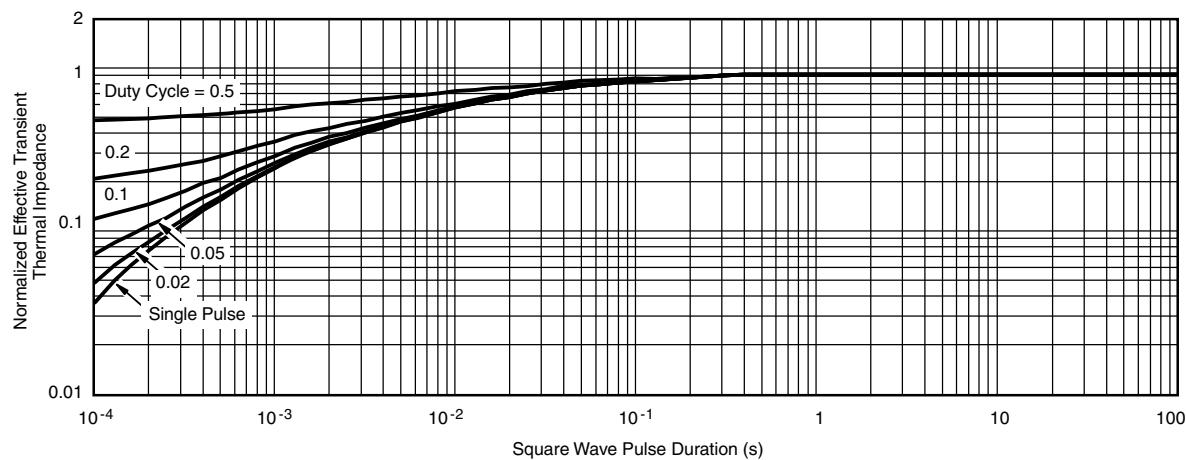
Threshold Voltage

**THERMAL RATINGS** ( $T_A = 25$  °C, unless otherwise noted)


Safe Operating Area



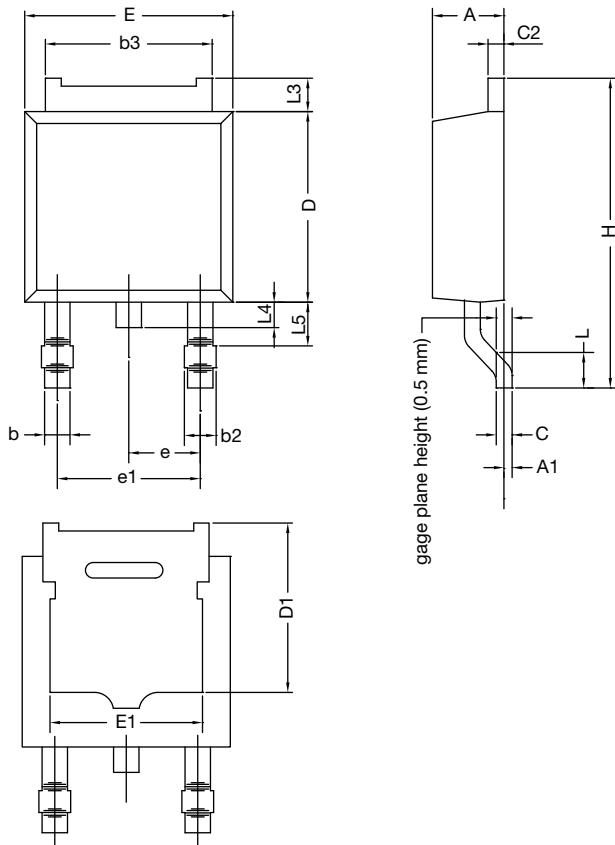
Normalized Thermal Transient Impedance, Junction-to-Ambient

**THERMAL RATINGS** ( $T_A = 25$  °C, unless otherwise noted)

**Normalized Thermal Transient Impedance, Junction-to-Case**
**Note**

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

## 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.

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