

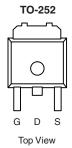
# N-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY				
V <sub>DS</sub> (V)	$r_{DS(on)}\left(\Omega\right)$	I <sub>D</sub> (A) <sup>a</sup>		
60	0.025 at V <sub>GS</sub> = 10 V	45		
00	0.030 at V <sub>GS</sub> = 4.5 V	40		

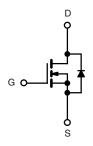
#### **FEATURES**

- TrenchFET® Power MOSFET
- 175 °C Junction Temperature





Drain Connected to Tab



N-Channel MOSFET

<b>ABSOLUTE MAXIMUM RATINGS</b> $T_C = 25$ °C, unless otherwise noted							
Parameter		Symbol	Limit	Unit			
Gate-Source Voltage		V <sub>GS</sub>	± 20	V			
Continuous Drain Current (T <sub>.I</sub> = 175 °C) <sup>b</sup>	T <sub>C</sub> = 25 °C	I-	45				
Continuous Drain Current (1 <sub>J</sub> = 175 °C) <sup>2</sup>	T <sub>C</sub> = 100 °C	I <sub>D</sub>	35				
Pulsed Drain Current	I <sub>DM</sub>	100	А				
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	23					
Avalanche Current	I <sub>AS</sub>	20					
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E <sub>AS</sub>	20	mJ			
Maximum Daylar Dissination	T <sub>C</sub> = 25 °C	P <sub>D</sub>	100	W			
Maximum Power Dissipation	T <sub>A</sub> = 25 °C	L D	3 <sup>a</sup>	] vv			
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C			

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Typical	Maximum	Unit		
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 10 sec	R <sub>thJA</sub>	18	22	°C/W		
waximum Junction-to-Ambient*	Steady State		40	50			
Maximum Junction-to-Case		$R_{thJC}$	3.2	4			

#### Notes:

a. Surface Mounted on 1" x 1" FR4 board,  $t \le 10$  sec.

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Parameter	Symbol Test Conditions		Min	Typ <sup>a</sup>	Max	Unit	
Static							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	60	60		V	
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.0	2.0	3.0	V	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
		V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V			1		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	μΑ	
		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	50			Α	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		0.025			
5 h	_	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 125 °C		0.055		0	
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 175 °C		0.069	Ω		
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10 A	0.030			1	
Forward Transconductance <sup>b</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 15 A		20		S	
Dynamic <sup>a</sup>							
Input Capacitance	C <sub>iss</sub>			1500		pF	
Output Capacitance	C <sub>oss</sub>	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		140			
Reverse Transfer Capacitance	C <sub>rss</sub>			60			
Total Gate Charge <sup>c</sup>	$Q_g$			11	17	nC	
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{DS} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 23 \text{ A}$		3			
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			3		1	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			8	15		
Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD}$ = 30 V, $R_L$ = 1.3 $\Omega$		15	25	ns	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$I_D\cong 23$ A, $V_{GEN}=10$ V, $R_g=2.5~\Omega$		30	45		
Fall Time <sup>c</sup>	t <sub>f</sub>			25	40		
Source-Drain Diode Ratings and Cha	aracteristics	(T <sub>C</sub> = 25 °C)					
Pulsed Current	I <sub>SM</sub>				50	Α	
Diode Forward Voltage	$V_{SD}$	$I_F = 15 \text{ A}, V_{GS} = 0 \text{ V}$		1.0	1.5	V	
Reverse Recovery Time	t <sub>rr</sub>	$I_F = 15 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}$		30	60	ns	

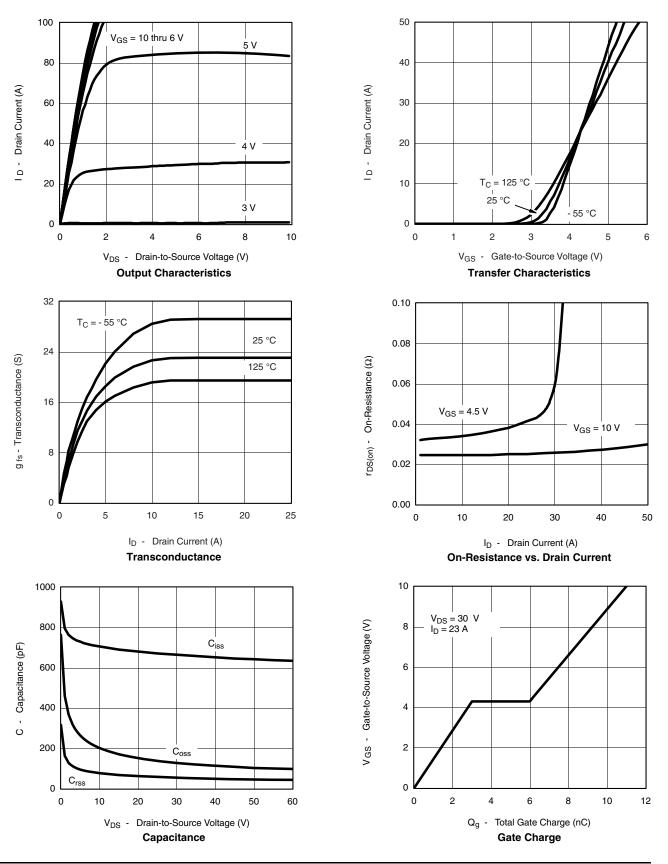
#### Notes:

- a. For design aid only; not subject to production testing.
- b. Pulse test; pulse width  $\leq$  300  $\mu$ s, duty cycle  $\leq$  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.

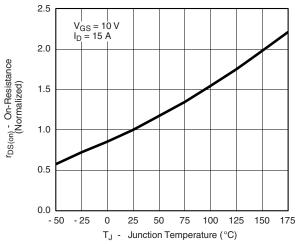


#### TYPICAL CHARACTERISTICS 25 °C unless noted

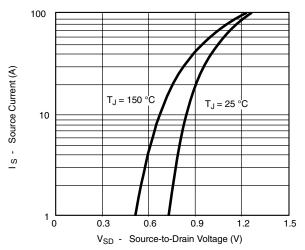




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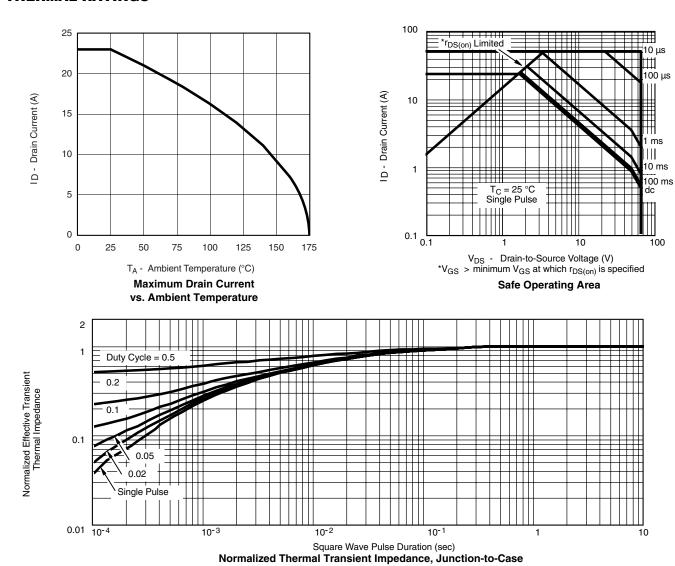
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



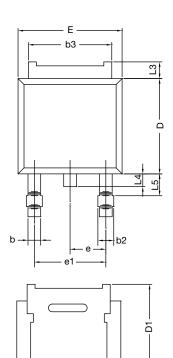
#### **THERMAL RATINGS**

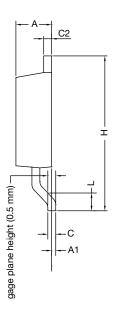


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### **TO-252AA CASE OUTLINE**





	MILLIMETERS		INC	HES	
DIM.	MIN.	MAX.	MIN.	MAX.	
Α	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	
С	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	-	
Н	9.40	10.41	0.370	0.410	
е	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					

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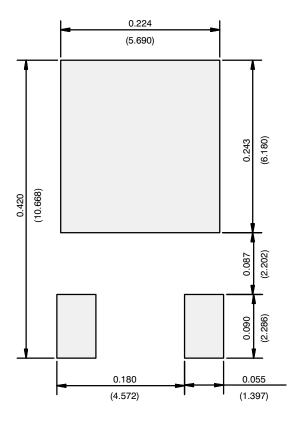
DWG: 5347

#### 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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