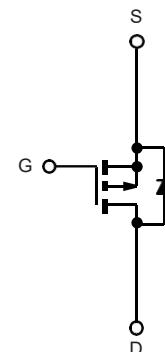
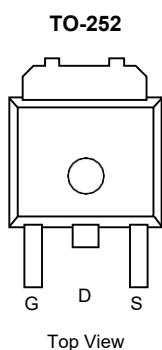


## P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
- 30	0.009 at $V_{GS} = - 10$ V	-60
	0.011 at $V_{GS} = - 4.5$ V	-58

### FEATURES

- Compliant to RoHS Directive 2002/95/EC



ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current ( $T_J = 175$ °C)	$I_D$	- 70 <sup>a</sup>	A	
$T_C = 125$ °C		- 58		
Pulsed Drain Current	$I_{DM}$	- 240		
Avalanche Current	$I_{AR}$	- 60		
Repetitive Avalanche Energy <sup>b</sup>	$E_{AR}$	180	mJ	
Power Dissipation	$P_D$	87 <sup>d</sup>	W	
$T_C = 25$ °C		78		
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Limit	Unit	
Junction-to-Ambient	$R_{thJA}$	60	°C/W	
PCB Mount		68.5		
Junction-to-Case	$R_{thJC}$	1.0		

Notes:

- Package limited.
- Duty cycle  $\leq 1$  %.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.

\* Pb containing terminations are not RoHS compliant, exemptions may apply.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C, unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = - 250 μA	- 30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = - 250 μA	- 1		- 3	
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> = - 30 V, V <sub>GS</sub> = 0 V			- 1	
		V <sub>DS</sub> = - 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			- 50	μA
		V <sub>DS</sub> = - 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			- 250	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = - 5 V, V <sub>GS</sub> = - 10 V	- 120			A
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 30 A		0.009		
		V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 30 A, T <sub>J</sub> = 125 °C		0.012		Ω
		V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 30 A, T <sub>J</sub> = 175 °C		0.013		
		V <sub>GS</sub> = - 4.5 V, I <sub>D</sub> = - 20 A		0.011		
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 75 A	20			S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = - 25 V, f = 1 MHz		4000		
Output Capacitance	C <sub>oss</sub>			1565		pF
Reversen Transfer Capacitance	C <sub>rss</sub>			715		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = - 15 V, V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 75 A		160	240	
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			32		nC
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			30		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = - 15 V, R <sub>L</sub> = 0.2 Ω I <sub>D</sub> ≈ - 75 A, V <sub>GEN</sub> = - 10 V, R <sub>g</sub> = 2.5 Ω		25	40	
Rise Time <sup>c</sup>	t <sub>r</sub>			225	360	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			150	240	ns
Fall Time <sup>c</sup>	t <sub>f</sub>			210	340	
<b>Source-Drain Diode Ratings and Characteristics<sup>b</sup> (T<sub>C</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>	I <sub>F</sub> = - 75 A, V <sub>GS</sub> = 0 V			- 70	
Pulsed Current	I <sub>SM</sub>				- 240	A
Forward Voltage <sup>a</sup>	V <sub>SD</sub>			- 1.2	- 1.5	V
Reverse Recovery Time	t <sub>rr</sub>			55	100	ns
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>			2.5	5	A
Reverse Recovery Charge	Q <sub>rr</sub>			0.07	0.25	μC

Notes:

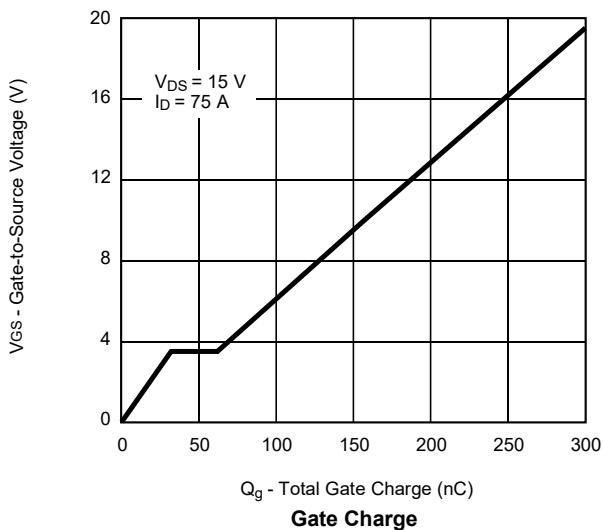
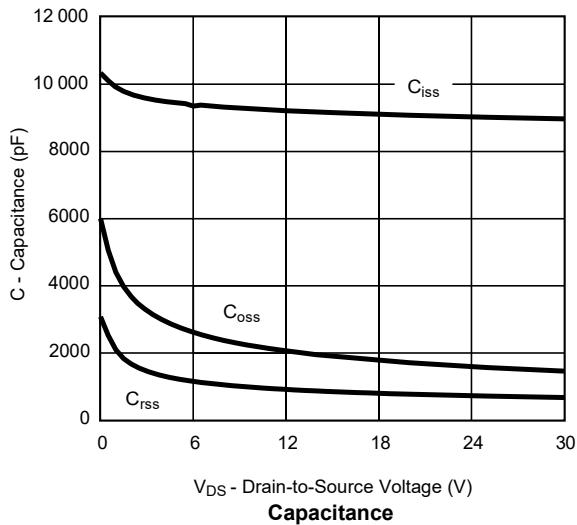
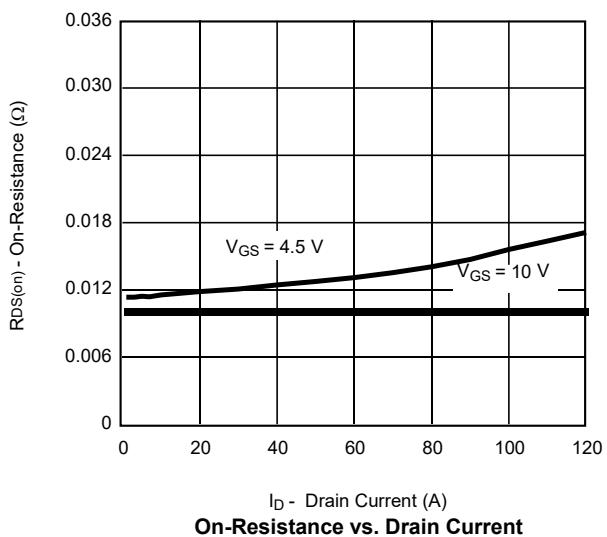
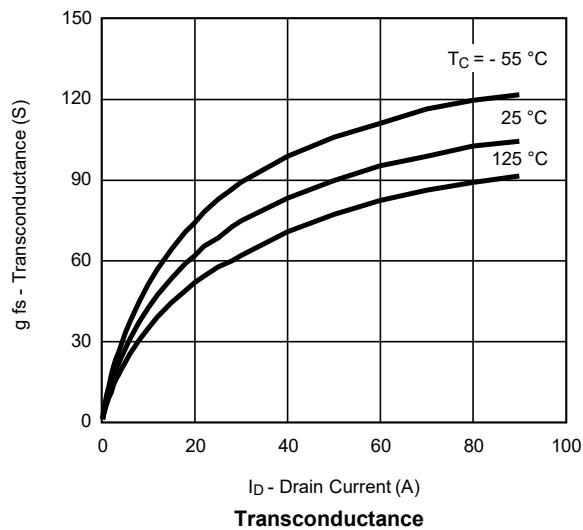
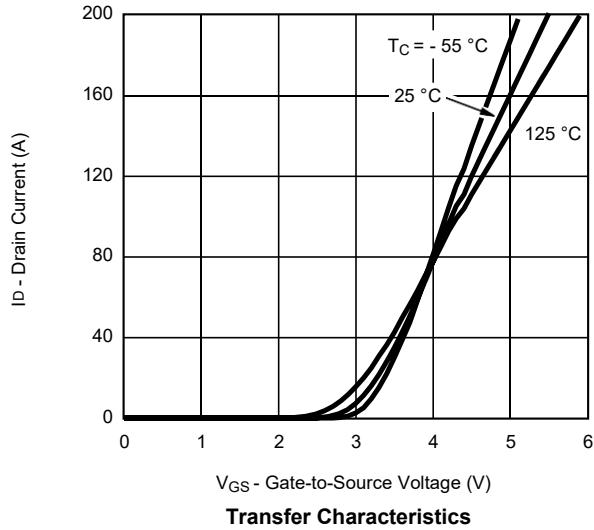
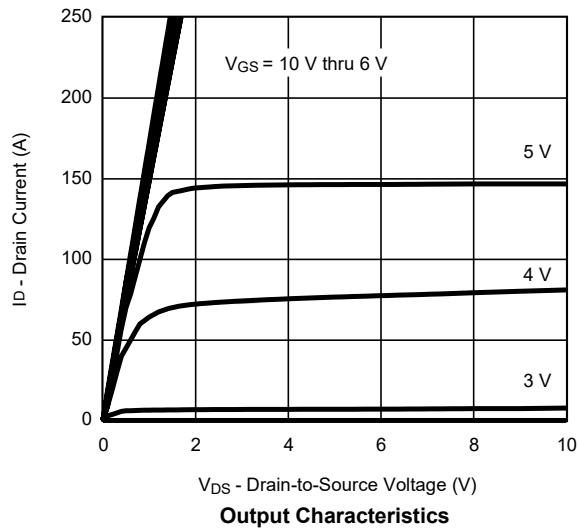
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

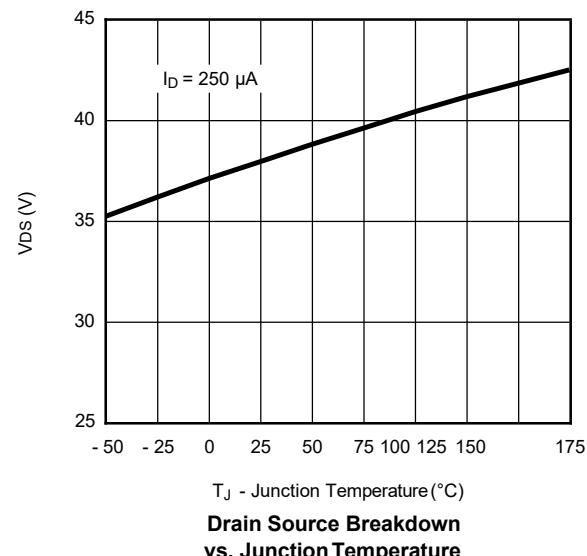
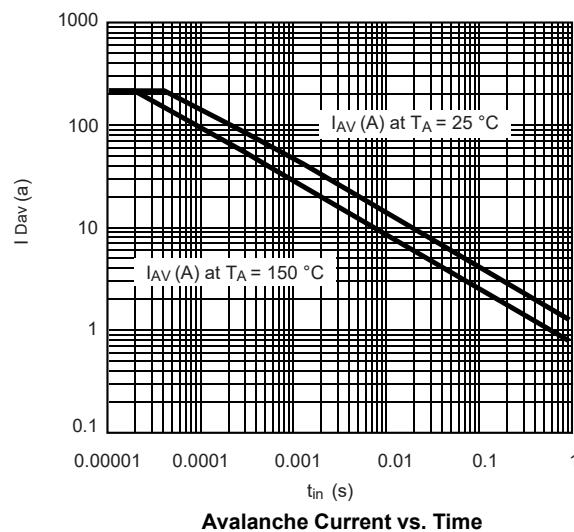
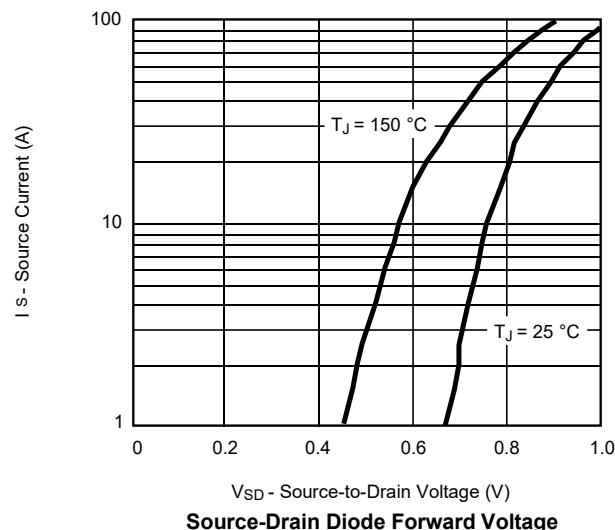
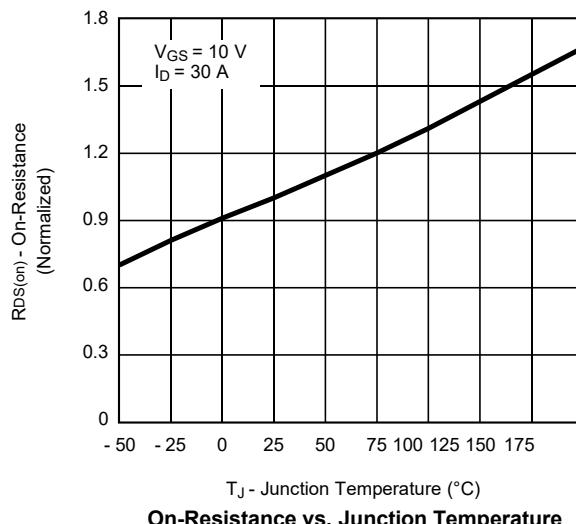
b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

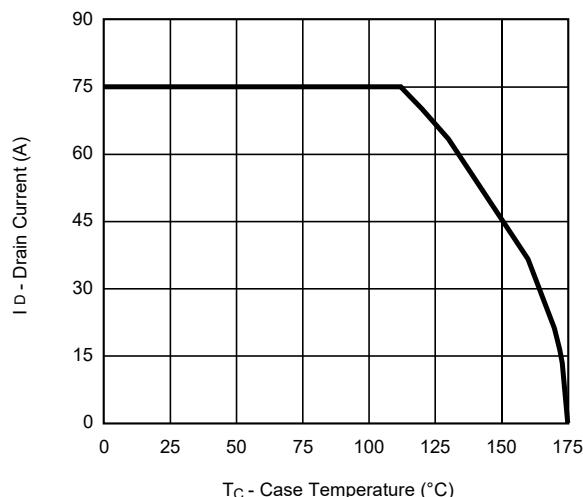
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

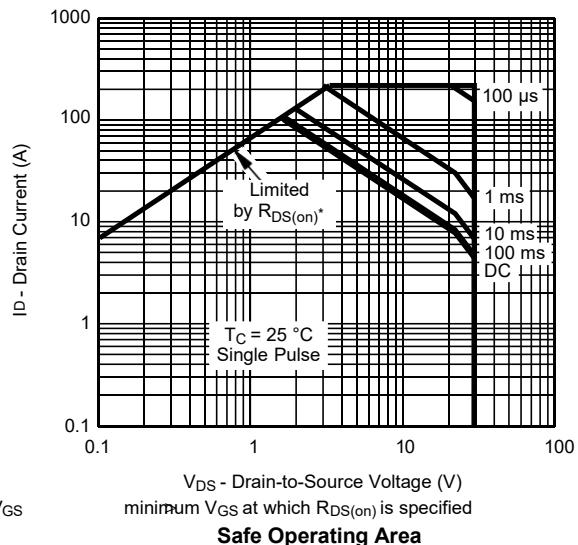


**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)


## THERMAL RATINGS



Maximum Avalanche and Drain Current  
vs. Case Temperature

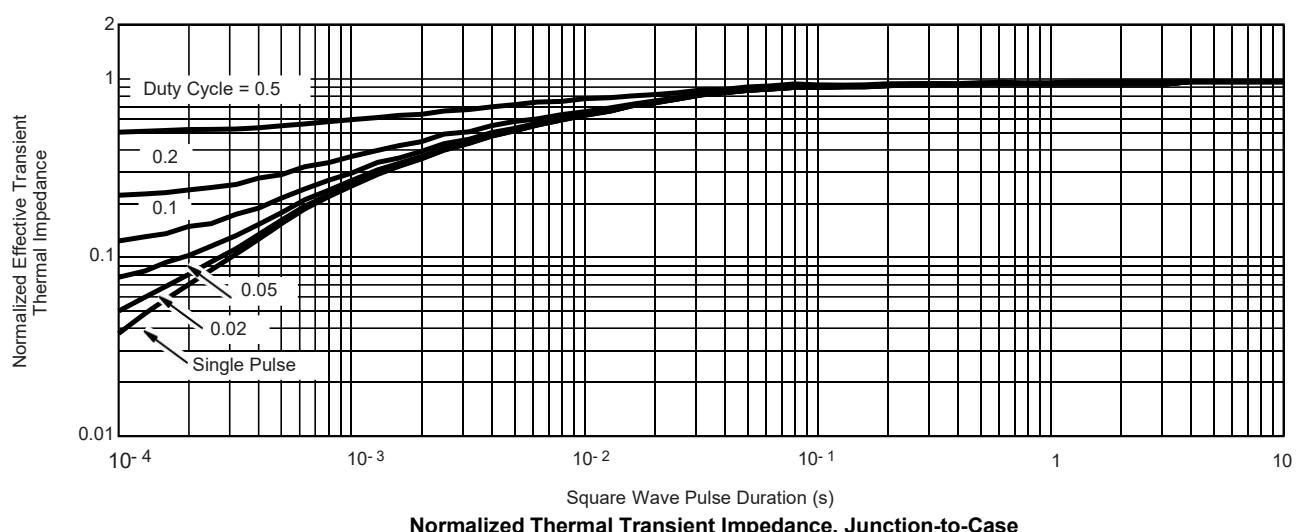


\*  $V_{GS}$

$T_C = 25^\circ\text{C}$

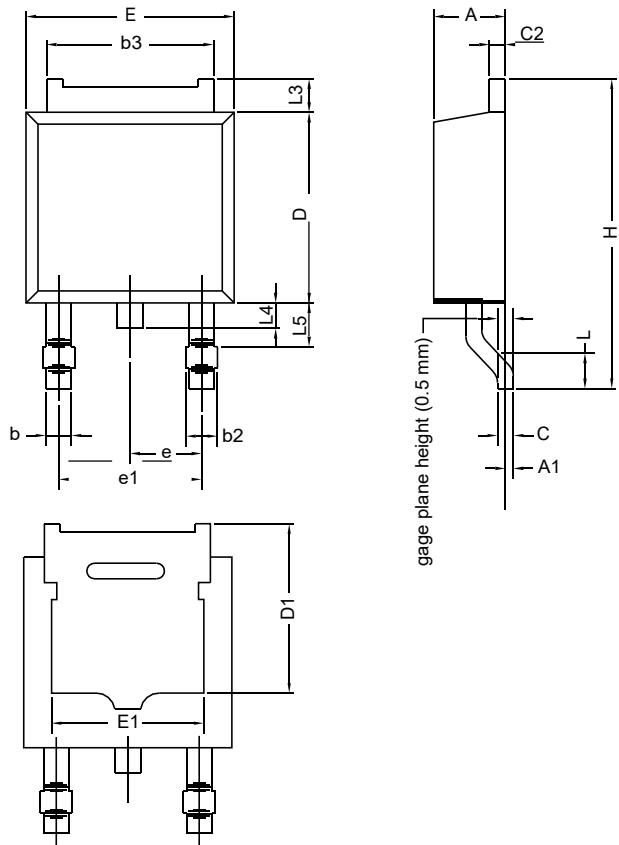
Single Pulse

## Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

## TO-252AA CASE OUTLINE

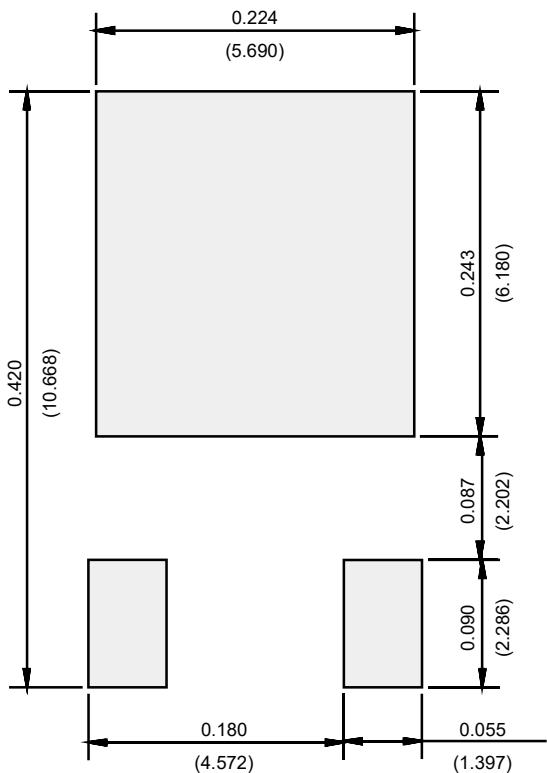


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40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