



Features

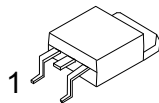
- High density cell design for ultra low R_{ds(on)}
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Product Summary

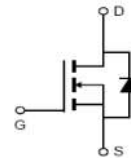
V _{DS}	30	V
R _{DS(on),TYP@ V_{GS}=10 V}	9	mΩ
I _D	50	A

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply



TO-252



N-Channel MOSFET

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	50	A
Drain Current-Continuous(T _C =100°C)	I _D (100°C)	35	A
Pulsed Drain Current	I _{DM}	140	A
Maximum Power Dissipation	P _D	60	W
Derating factor		0.4	W/°C
Single pulse avalanche energy ^(Note 5)	E _{AS}	70	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 175	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Case ^(Note 2)	R _{θJC}	2.5	°C/W
--	------------------	-----	------

**Electrical Characteristics (T_C=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	33	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.4	2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =25A	-	9	11	mΩ
		V _{GS} =5V, I _D =20A	-	11.3	14	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A	15	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	2000	-	PF
Output Capacitance	C _{oss}		-	280	-	PF
Reverse Transfer Capacitance	C _{rss}		-	160	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, I _D =20A V _{GS} =10V, R _{GEN} =1.8Ω	-	10	-	nS
Turn-on Rise Time	t _r		-	8	-	nS
Turn-Off Delay Time	t _{d(off)}		-	30	-	nS
Turn-Off Fall Time	t _f		-	5	-	nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =25A, V _{GS} =10V	-	23	-	nC
Gate-Source Charge	Q _{gs}		-	7	-	nC
Gate-Drain Charge	Q _{gd}		-	4.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =25A	-	0.85	1.2	V
Diode Forward Current	I _S		-	-	50	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 50A di/dt = 100A/μs (Note 3)	-	22	35	nS
Reverse Recovery Charge	Q _{rr}		-	11	18	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

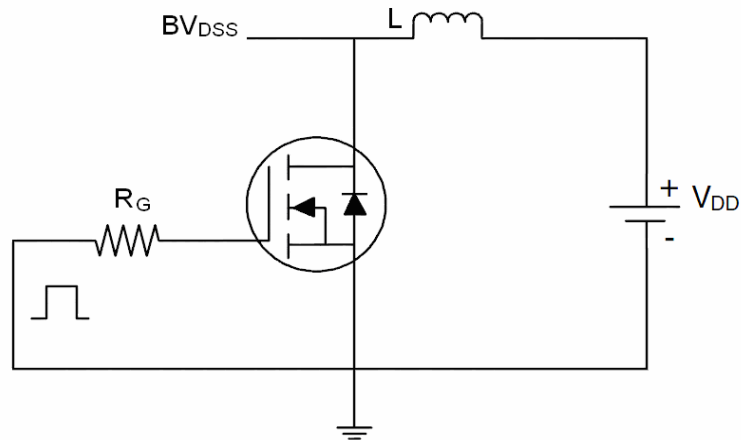
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=1mH, R_g=25Ω

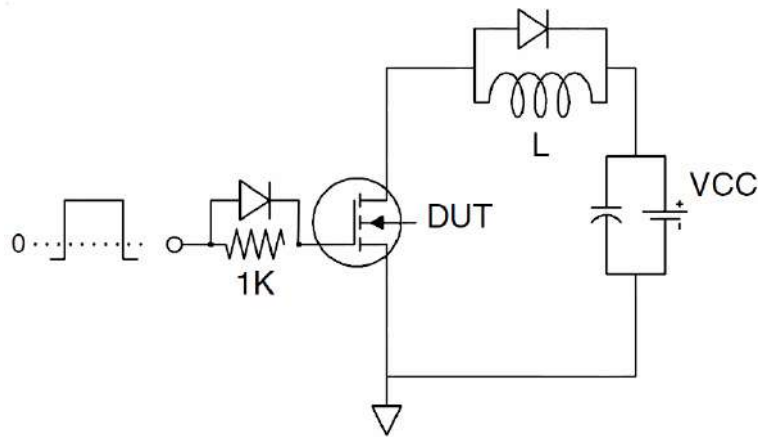


Test circuit

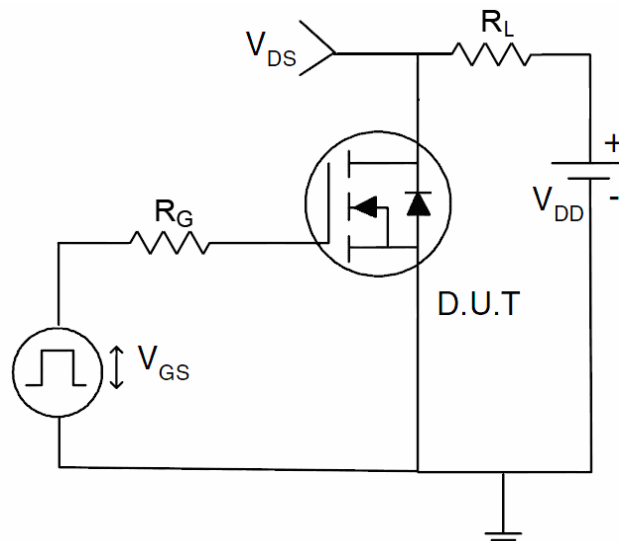
1) E_{AS} test Circuits



2) Gate charge test Circuit:



3) Switch Time Test Circuit:





Typical Electrical and Thermal Characteristics (Curves)

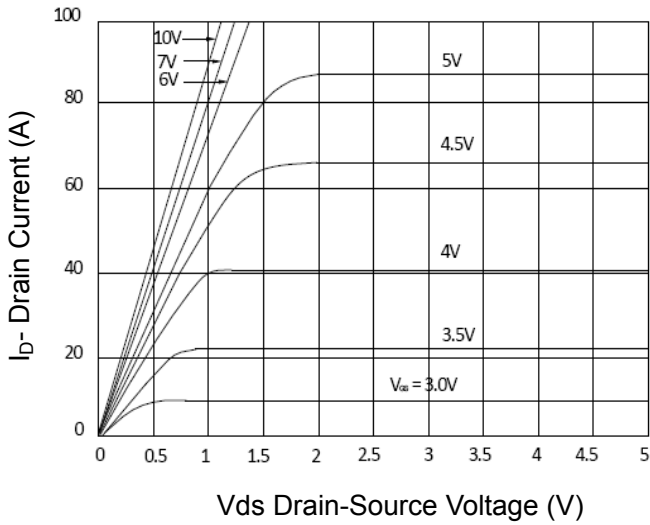


Figure 1 Output Characteristics

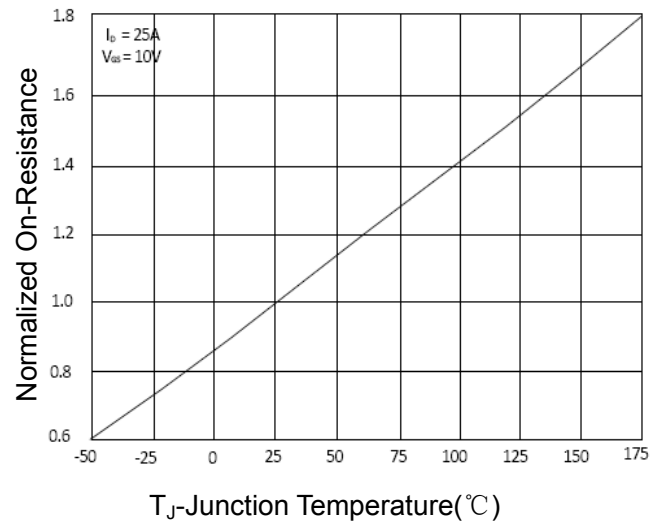


Figure 4 Rdson-Junction Temperature

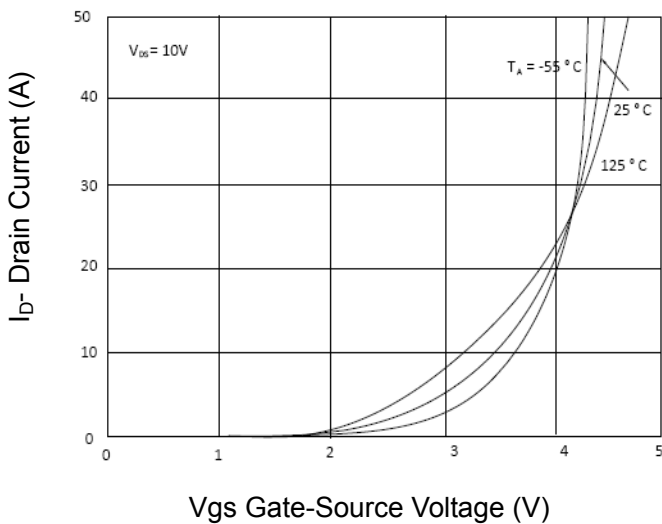


Figure 2 Transfer Characteristics

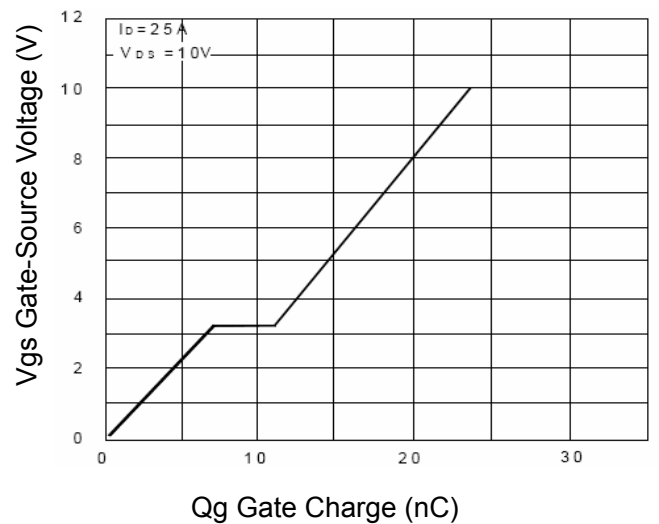


Figure 5 Gate Charge

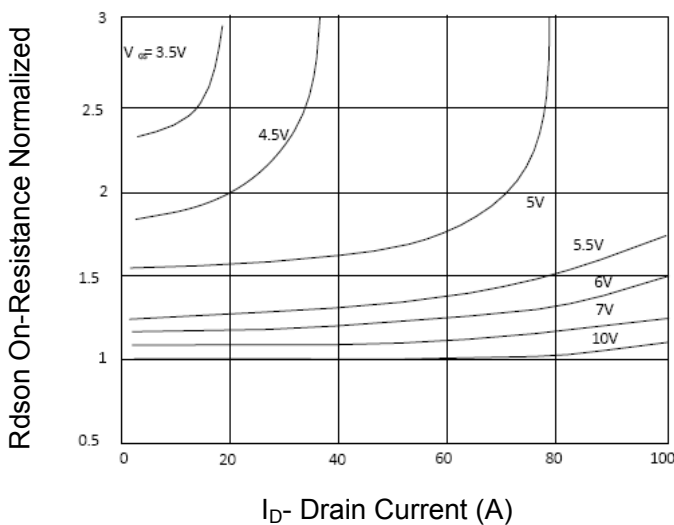


Figure 3 Rdson- Drain Current

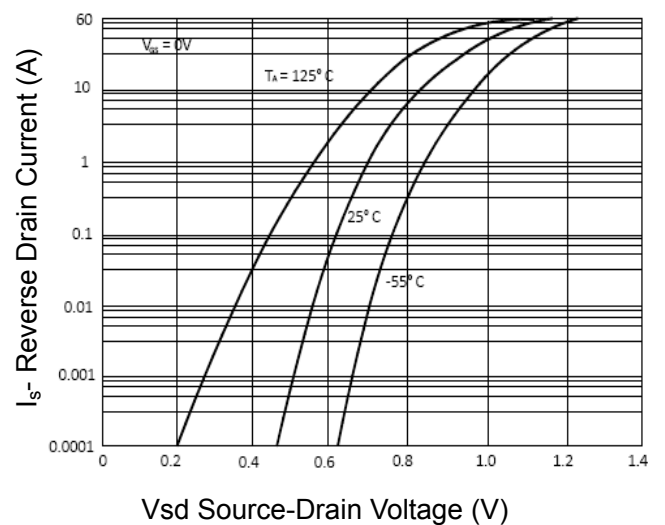


Figure 6 Source- Drain Diode Forward

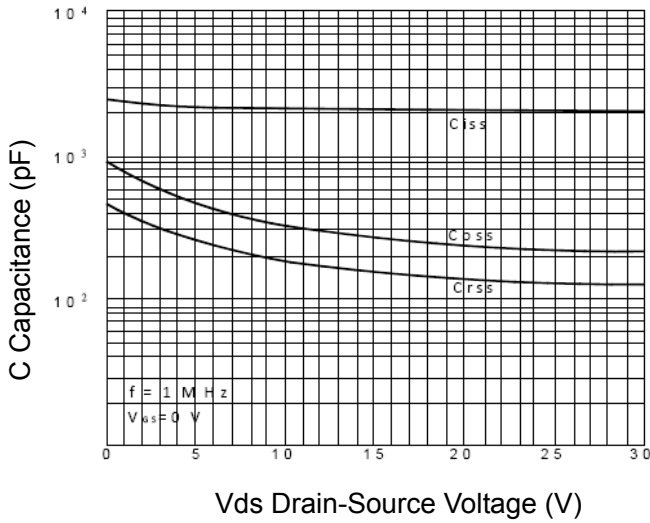


Figure 7 Capacitance vs V_{ds}

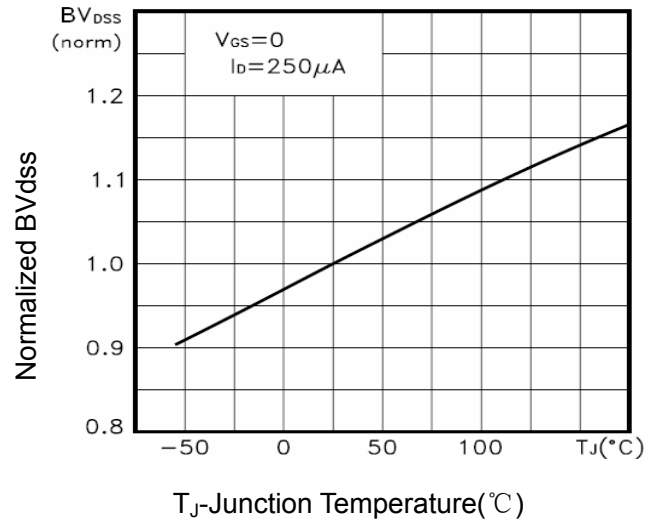


Figure 9 BV_{DSS} vs Junction Temperature

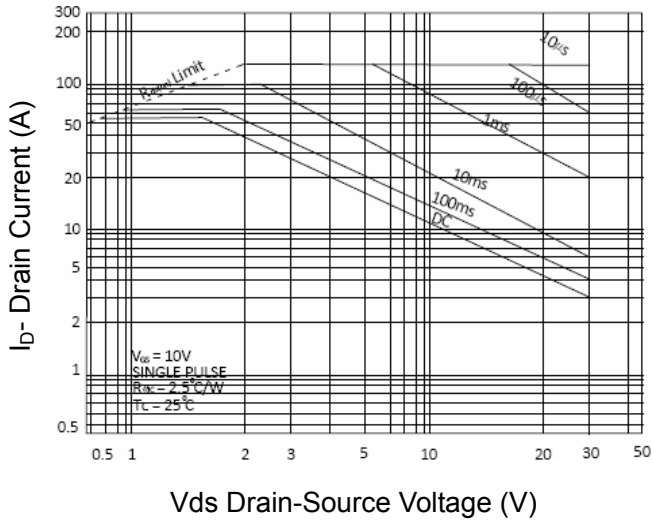


Figure 8 Safe Operation Area

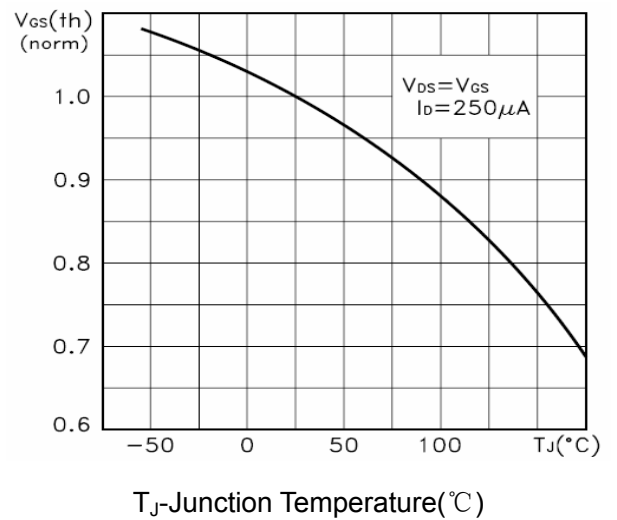


Figure 10 V_{GS(th)} vs Junction Temperature

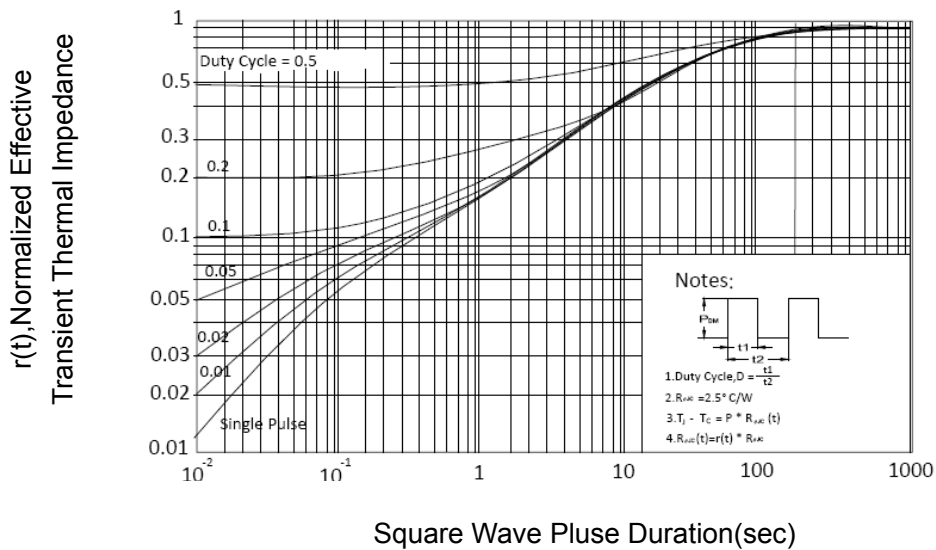
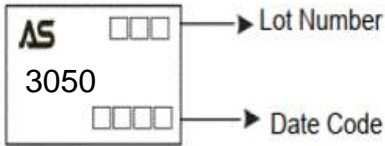
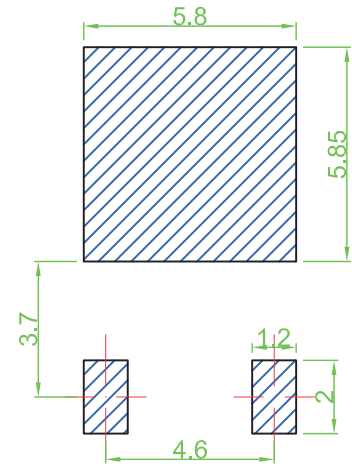
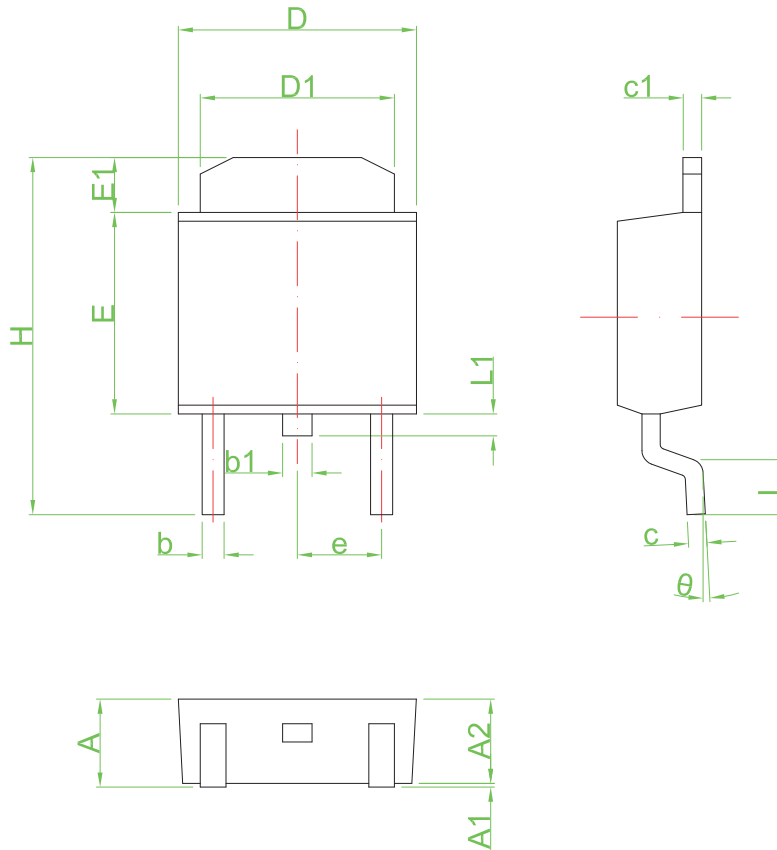


Figure 11 Normalized Maximum Transient Thermal Impedance

Ordering and Marking Information

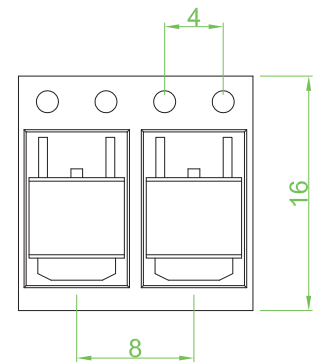
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM3050KQ-R	3050	TO-252	Tape&Reel	2500

PACKAGE	MARKING
TO-252	 <p>The diagram shows a TO-252 package with the following markings: 'AS' in the top left, '3050' in the center, and two sets of four empty boxes. An arrow points from the top-right boxes to 'Lot Number', and another arrow points from the bottom-right boxes to 'Date Code'.</p>



Recommended Land Pattern

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
theta	0°	8°	0°	8°



**IMPORTANT NOTICE**

Xi'an Ascend Semiconductor incorporated MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Xi'an Ascend Semiconductor Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Xi'an Ascend Semiconductor Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Xi'an Ascend Semiconductor Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume .

all risks of such use and will agree to hold Ascendsemi Incorporated and all the companies whose products are represented on Xi'an Ascend Semiconductor Incorporated website, harmless against all damages.

Xi'an Ascend Semiconductor Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Xi'an Ascend Semiconductor Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Xi'an Ascend Semiconductor Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

www.ascendsemi.com