

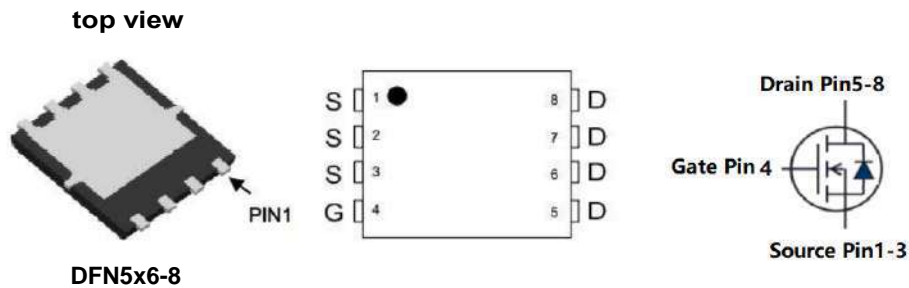


### Features

- Enhancement mode
- Very low on-resistance  $R_{DS(on)}$  @  $V_{GS}=4.5\text{ V}$
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant

### Product Summary

$V_{DS}$	30	V
$R_{DS(on),TYP}$ @ $V_{GS}=10\text{ V}$	2.1	m $\Omega$
$I_D$	120	A



### Maximum ratings, at $T_A = 25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	30	V
$I_S$	Diode continuous forward current	$T_C = 25^\circ\text{C}$ 120	A
$I_D$	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$ 120 $T_C = 100^\circ\text{C}$ 80	A
$I_{DM}$	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$ 480	A
EAS	Avalanche energy, single pulsed ②	100	mJ
$P_D$	Maximum power dissipation	$T_C = 25^\circ\text{C}$ 45	W
$V_{GS}$	Gate-Source voltage	$\pm 20$	V
$T_{STG} T_J$	Storage and operating temperature range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.8	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62	$^\circ\text{C/W}$

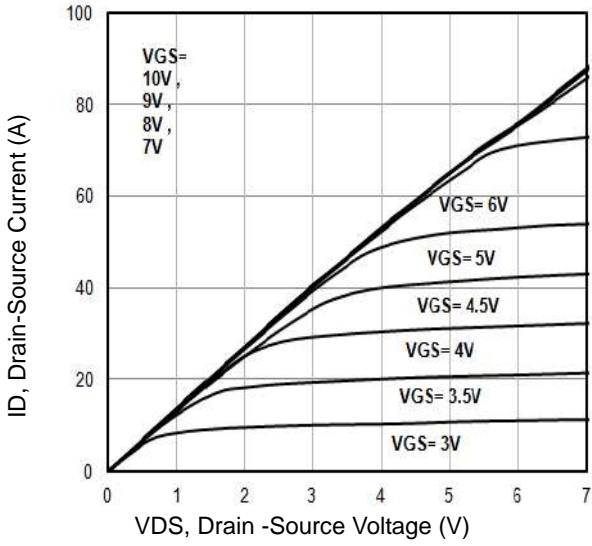


Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>j</sub>=25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	--	--	1	μA
	Zero Gate Voltage Drain Current( T <sub>j</sub> =85°C	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	--	--	30	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>③</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	--	2.1	3.5	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>③</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =30A	--	3.6	4.5	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>j</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	--	2880	--	pF
C <sub>oss</sub>	Output Capacitance		--	434	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	410	--	pF
R <sub>g</sub>	Gate Resistance	f=1MHz	--	1.2	--	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	--	63	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	13	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	16	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =20V, I <sub>D</sub> =20A, R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	--	14	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	18	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	99	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	45	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>j</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage	I <sub>SD</sub> =20A, V <sub>GS</sub> =0V	--	0.79	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	T <sub>j</sub> =25°C, I <sub>SD</sub> =20A, V <sub>GS</sub> =0V	--	32	--	nS
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs		31		nC

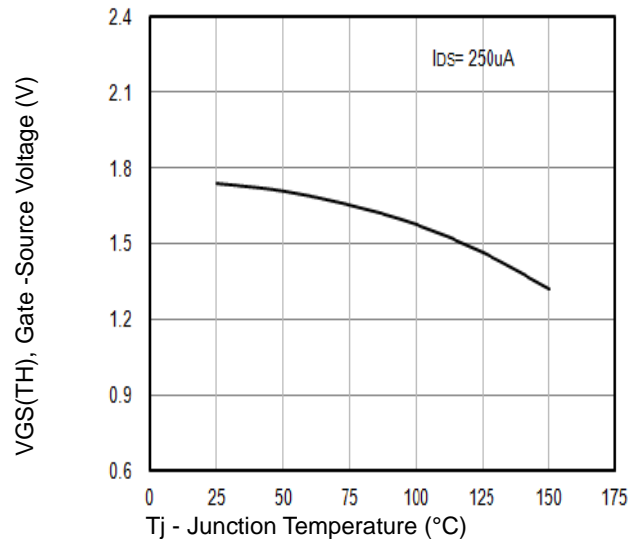
NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.5mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 20A, V<sub>GS</sub> = 10V. Part not recommended for use above this value
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

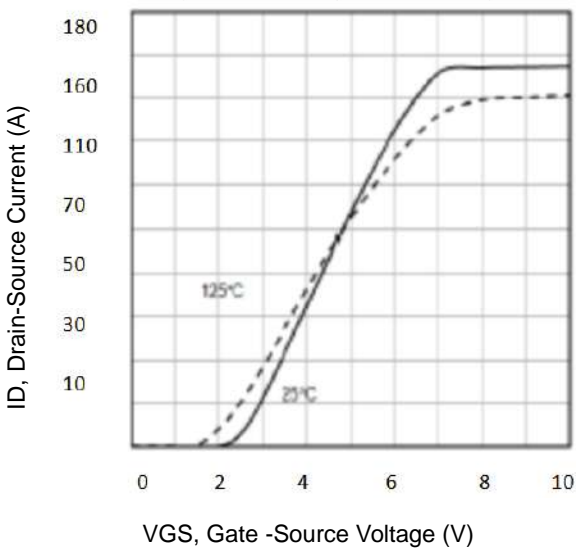
### Typical Characteristics



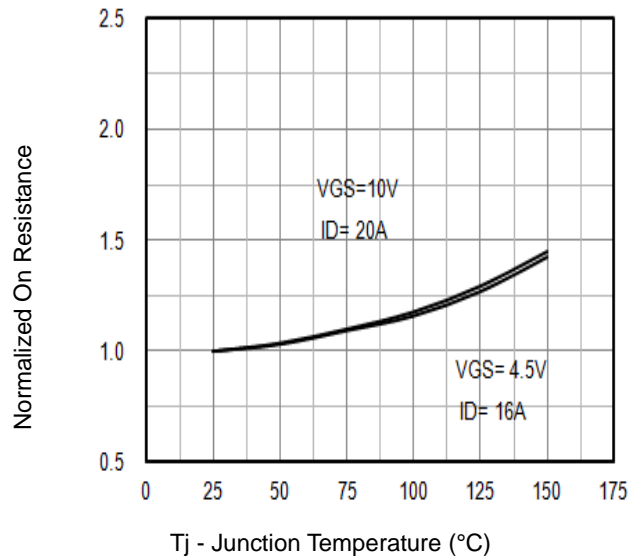
**Fig1.** Typical Output Characteristics



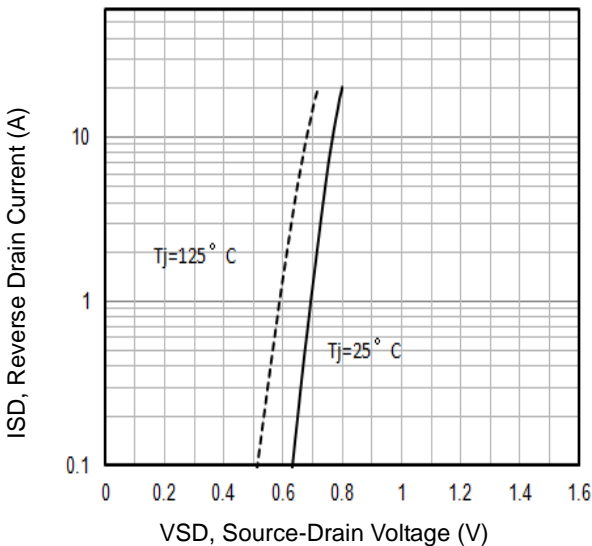
**Fig2.**  $V_{GS(TH)}$  Gate-Source Voltage (V) vs.  $T_j$  - Junction Temperature ( $^{\circ}C$ )



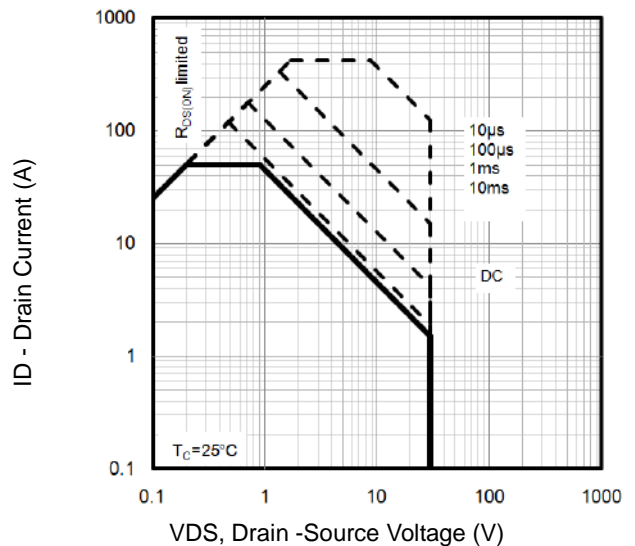
**Fig3.** Typical Transfer Characteristics



**Fig4.** Normalized On-Resistance Vs.  $T_j$



**Fig5.** Typical Source-Drain Diode Forward Voltage



**Fig6.** Maximum Safe Operating Area



Typical Characteristics

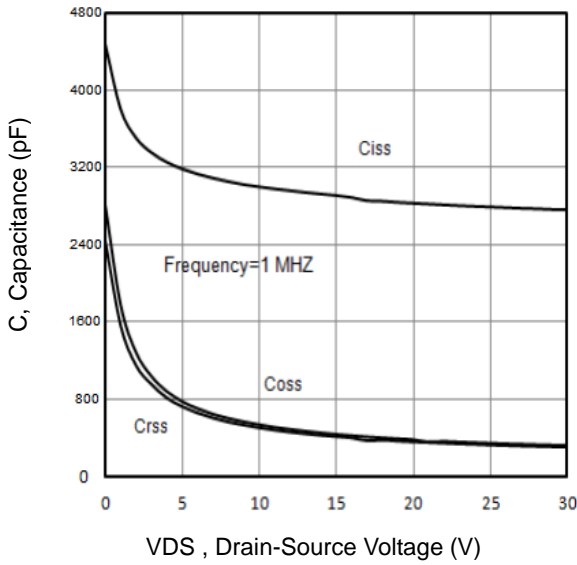


Fig7. Typical Capacitance Vs.Drain-Source Voltage

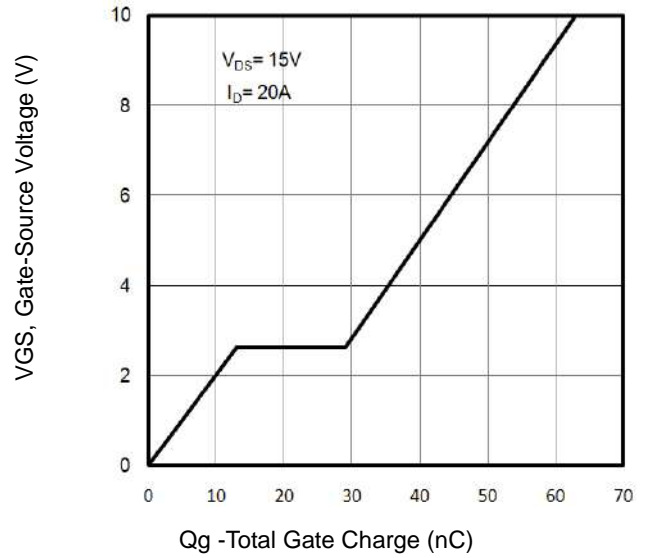


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

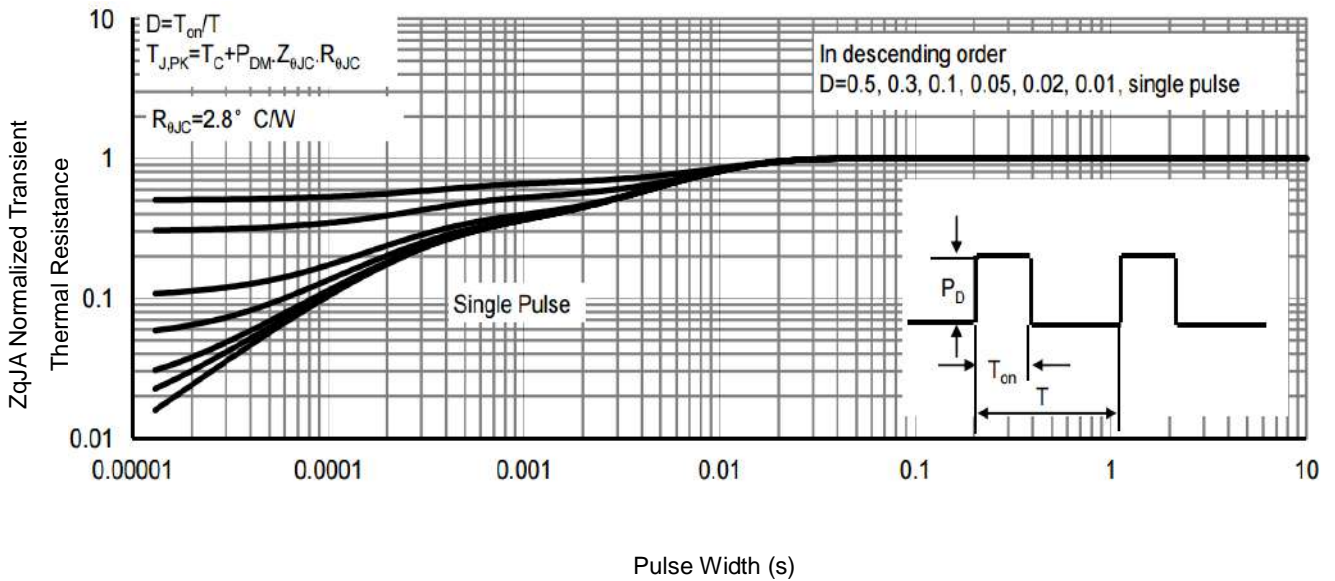


Fig9. Normalized Maximum Transient Thermal Impedance

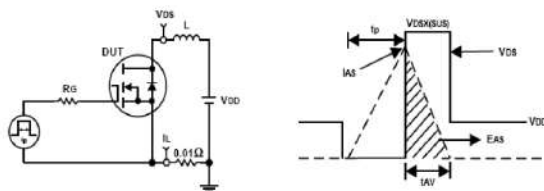


Fig10. Unclamped Inductive Test Circuit and waveforms

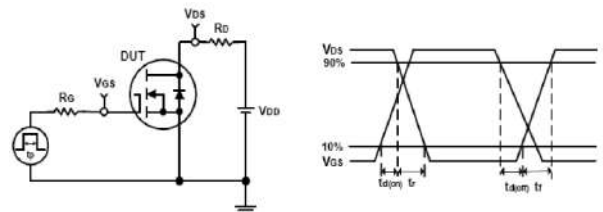
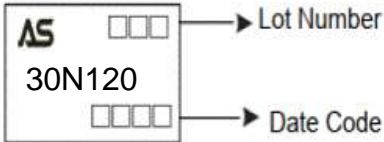


Fig11. Switching Time Test Circuit and waveforms



### Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM30N120Q-R	30N120	DFN5*6-8	Tape&Reel	4000/Reel

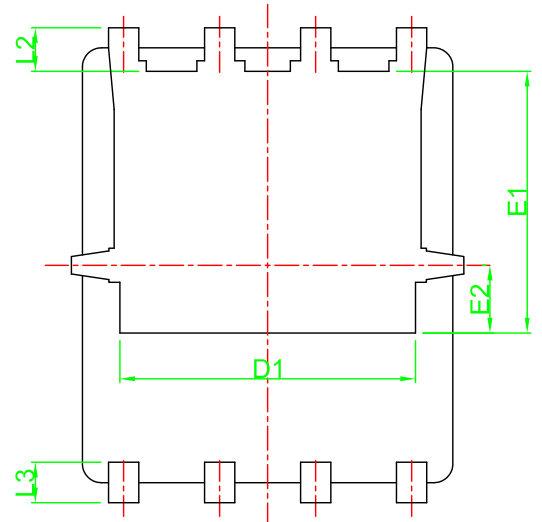
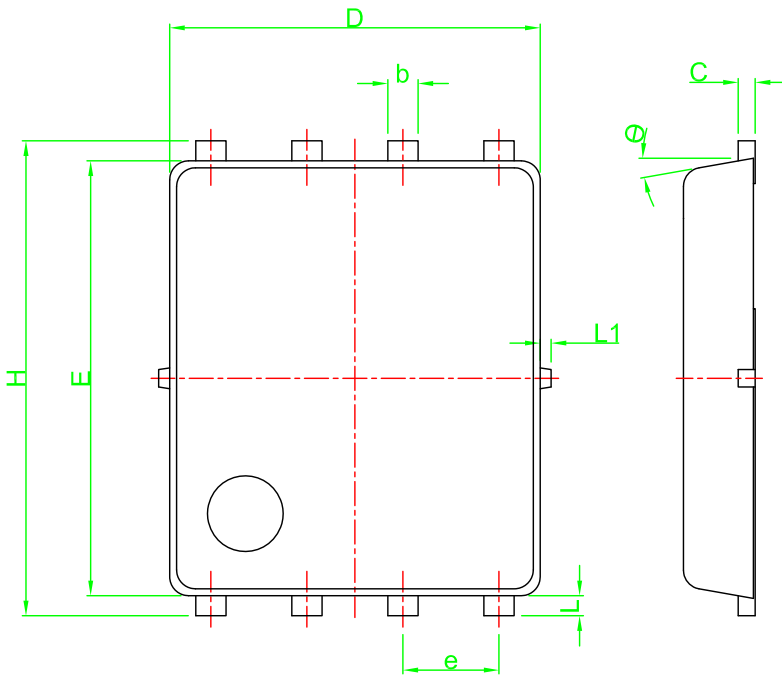
PACKAGE	MARKING
DFN5*6-8	



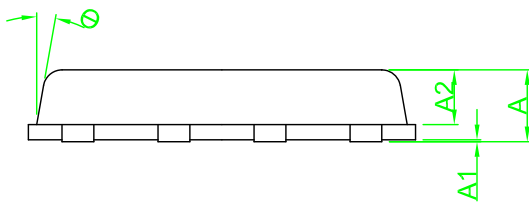
ASCENDSEMI

# ASDM30N120Q

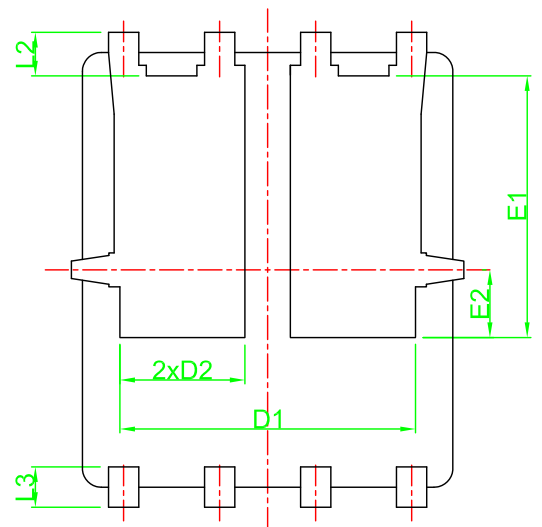
30V N-Channel MOSFET



TYPE I



DFN5\*6-8



TYPE II

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.85	1.00	0.033	0.039
A1	0.01	0.05	0.000	0.002
A2	0.69	0.75	0.027	0.030
b	0.40	0.45	0.016	0.018
C	0.20	0.30	0.008	0.012
D	4.80	4.95	0.189	0.195
D1	3.91	4.06	0.154	0.160
D2	1.60	1.80	0.063	0.071
e	1.27 TYP		0.05 TYP	
E	5.65	5.80	0.222	0.228
E1	3.46	3.50	0.136	0.138
E2	0.80	0.95	0.031	0.037
L	0.15	0.3	0.006	0.012
L1	0.08	0.15	0.003	0.006
L2	0.58	0.73	0.023	0.029
L3	0.45	0.60	0.018	0.024
H	6.15	6.28	0.242	0.247
$\theta$	8°	12°	8°	12°

**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](http://www.ascendsemi.com)**