



## DESCRIPTION

The AM6512 is available in DFN8(5x6) package.

## ORDERING INFORMATION

Package Type	Part Number	
DFN8(5x6) SPQ: 3,000pcs/ Reel	J8	AM6512J8R
		AM6512J8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

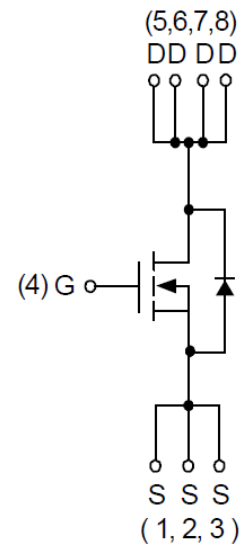
## FEATURES

- 30V/80A,  
 $R_{DS(ON)} = 1.9m\Omega$  (Max.) @  $V_{GS} = 10V$   
 $R_{DS(ON)} = 3m\Omega$  (Max.) @  $V_{GS} = 4.5V$
- 100% UIS +  $R_g$  Tested
- Reliable and Rugged
- Lower  $Q_g$  and  $Q_{gd}$  for high-speed switching
- Lower  $R_{DS(ON)}$  to Minimize Conduction Losses
- Available in DFN8(5x6) package.

## APPLICATION

- Power Management in Desktop Computer or DC/DC Converters.

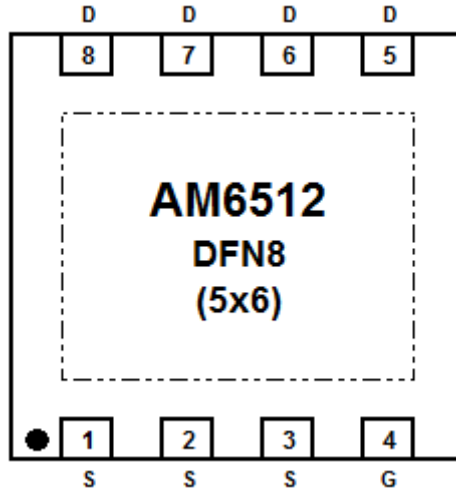
## PIN DESCRIPTION



N-Channel MOSFET



## PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain



## ABSOLUTE MAXIMUM RATINGS

T<sub>A</sub> = 25°C, unless Otherwise Noted

V <sub>DSS</sub> , Drain-Source Voltage		30V
V <sub>GSS</sub> , Gate-Source Voltage		±20V
T <sub>J</sub> , Maximum Junction Temperature		150°C
T <sub>STG</sub> , Storage Temperature Range		-55°C~150°C
I <sub>S</sub> , Diode Continuous Forward Current	T <sub>C</sub> =25°C	42.5A
I <sub>D</sub> <sup>NOTE1</sup> , Continuous Drain Current	T <sub>C</sub> =25°C	80*A
	T <sub>C</sub> =100°C	75A
I <sub>DM</sub> <sup>NOTE2</sup> , Pulsed Drain Current	T <sub>C</sub> =25°C	160A
P <sub>D</sub> , Maximum Power Dissipation	T <sub>C</sub> =25°C	78W
	T <sub>C</sub> =100°C	31W
R <sub>θJC</sub> , Thermal Resistance-Junction to Case	Steady State	1.6°C/W
I <sub>D</sub> <sup>NOTE3</sup> , Continuous Drain Current	T <sub>A</sub> =25°C	28A
	T <sub>A</sub> =70°C	22A
P <sub>D</sub> <sup>NOTE3</sup> , Maximum Power Dissipation	T <sub>A</sub> =25°C	2.3W
	T <sub>A</sub> =70°C	1.5W
R <sub>θJA</sub> <sup>NOTE3</sup> , Thermal Resistance-Junction to Ambient	t ≤10s	20°C/W
	Steady State	55°C/W
I <sub>AS</sub> <sup>NOTE4</sup> , Avalanche Current, Single Pulse	L=0.1mH	43A
E <sub>AS</sub> <sup>NOTE4</sup> , Avalanche Energy, Single Pulse	L=0.1mH	92mJ

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1,\*: Max. continue current is limited by bonding wire.

NOTE2: Pulse width is limited by max. junction temperature.

NOTE3: R<sub>θJA</sub> steady state t=999s.

NOTE4: UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T<sub>J</sub>=25°C).



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless Otherwise Noted

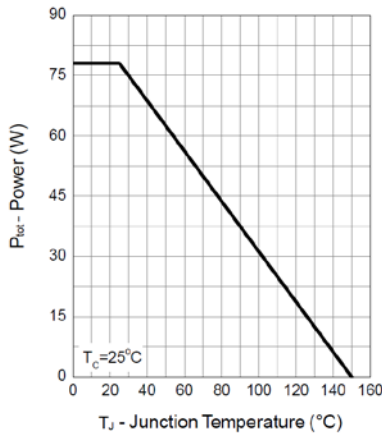
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =-250μA	30	-	-	V
Drain-Source Breakdown Voltage (transient)	BV <sub>DSS(t)</sub>	V <sub>GS</sub> =0V, I <sub>D(aval)</sub> =40A T <sub>case</sub> =25°C, t <sub>transient</sub> =100ns	34	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>J</sub> =85°C	-	-	30	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	1.3	1.6	2.3	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Drain-Source On-state Resistance	R <sub>DS(ON)</sub> NOTE5	V <sub>GS</sub> =10V, I <sub>DS</sub> =20A	-	1.5	1.9	mΩ
		T <sub>J</sub> =125°C	-	2.2	-	
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =12A	-	2.2	3	
Forward Transconductance	G <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>DS</sub> =15A	-	32	-	S
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub> NOTE5	I <sub>SD</sub> =20A, V <sub>GS</sub> =0V	-	0.8	1.1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> =20A, dI <sub>SD</sub> /dt=100A/μs	-	50	-	ns
Charge Time	t <sub>a</sub>		-	23.5	-	
Discharge Time	t <sub>b</sub>		-	27.5	-	
Reverse Recovery Charge	Q <sub>rr</sub>		-	45	-	
<b>Dynamic Characteristics</b>						
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	-	0.9	2	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz	-	2820	3666	pF
Output Capacitance	C <sub>oss</sub>		-	1910	2674	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	140	210	
Turn-on Delay Time	t <sub>d(ON)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω	-	15.5	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	11	-	
Turn-off Delay Time	t <sub>d(OFF)</sub>		-	35	-	
Turn-off Fall Time	t <sub>f</sub>		-	40	-	
<b>Gate Charge Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>DS</sub> =20A	-	44.5	57.8	nC
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =20A	-	21.2	-	
Threshold Gate Charge	Q <sub>g(th)</sub>		-	2.9	-	
Gate-Source Charge	Q <sub>gs</sub>		-	4.3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	8.3	-	

NOTE5: Pulse test ; pulse width≤300us, duty cycle≤2%.

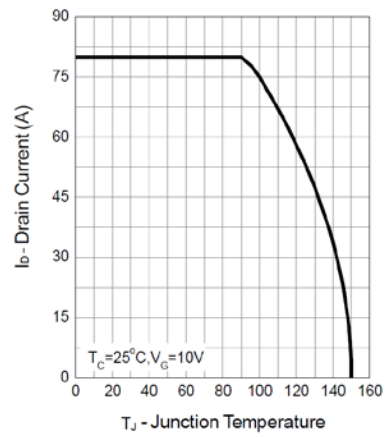


## TYPICAL PERFORMANCE CHARACTERISTICS

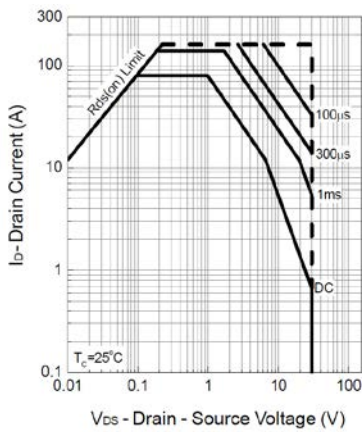
### 1. Power Dissipation



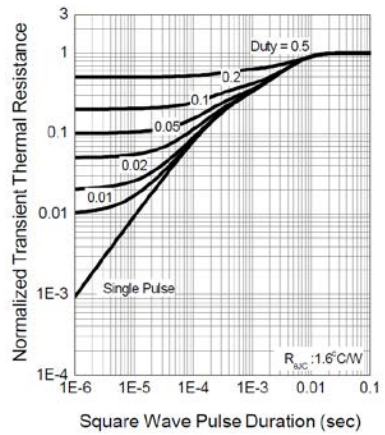
### 2. Drain Current



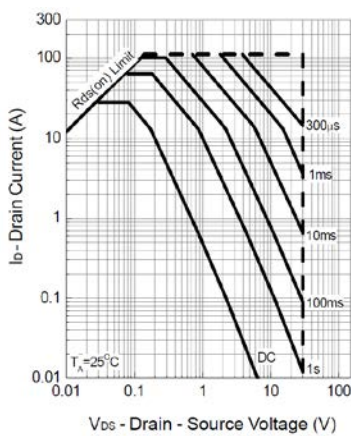
### 3. Safe Operation Area



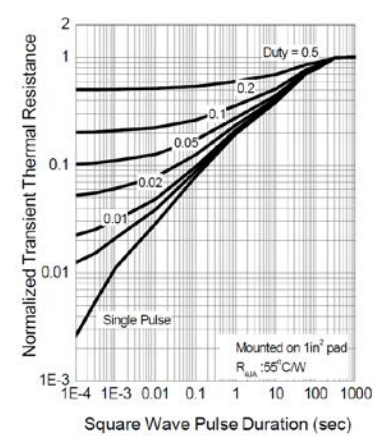
### 4. Thermal Transient Impedance



### 5. Safe Operation Area

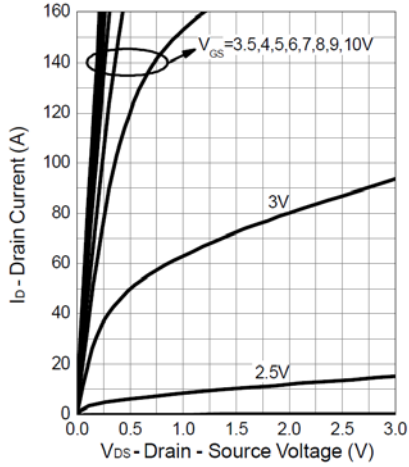


### 6. Thermal Transient Impedance

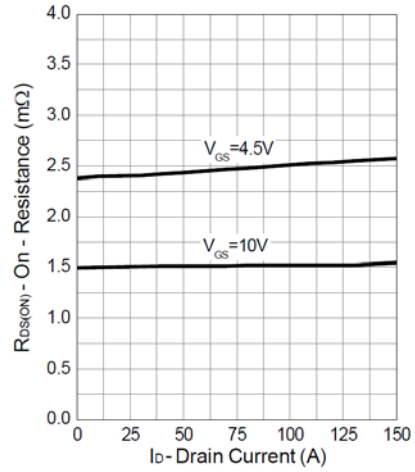




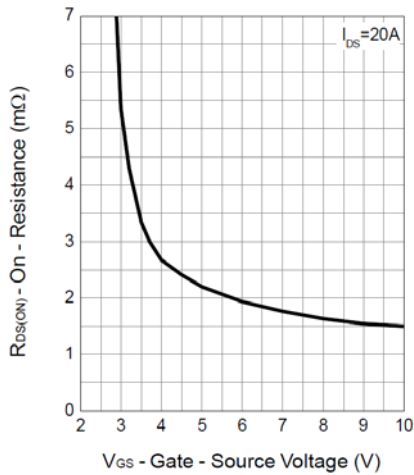
7. Output Characteristics



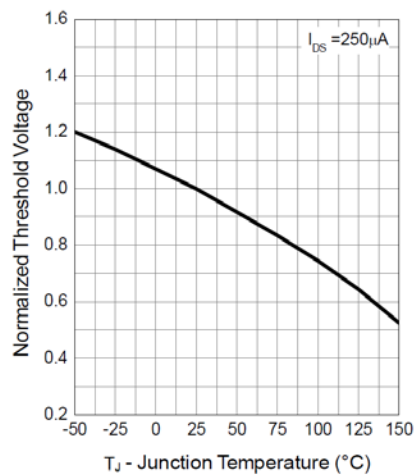
8. Drain-Source On Resistance



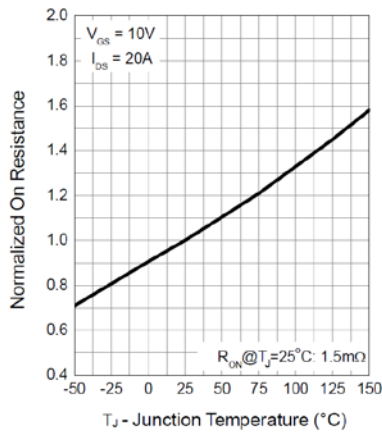
9. Gate-Source On Resistance



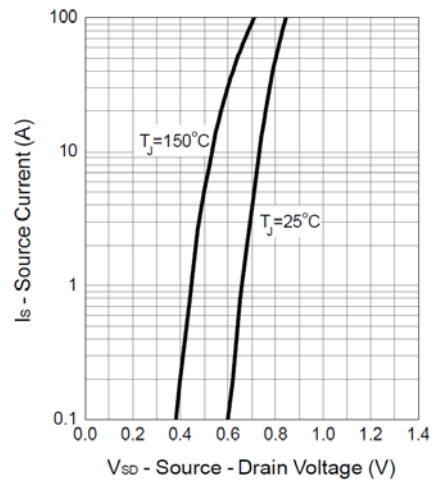
10. Gate Threshold Voltage



11. Drain-Source On Resistance

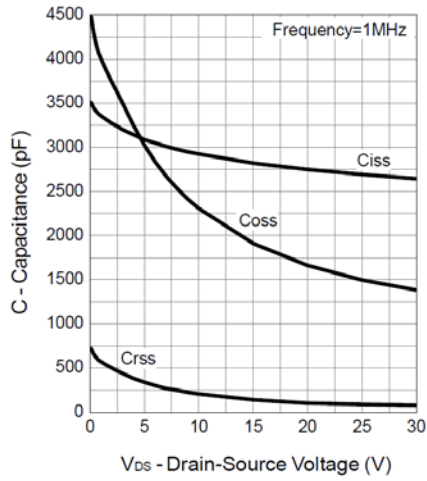


12. Source-Drain Diode Forward

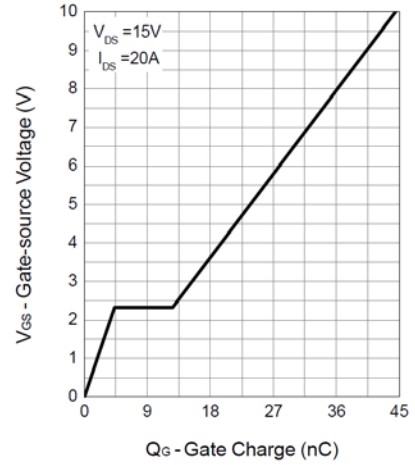




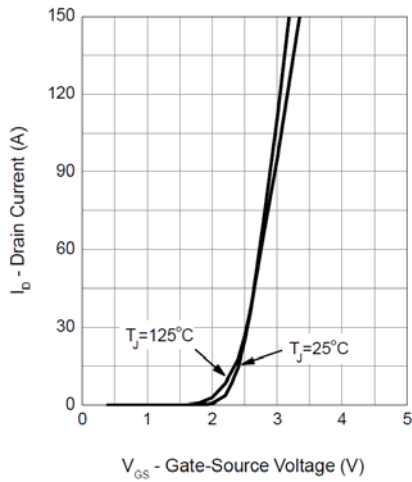
13. Capacitance



14. Gate Charge



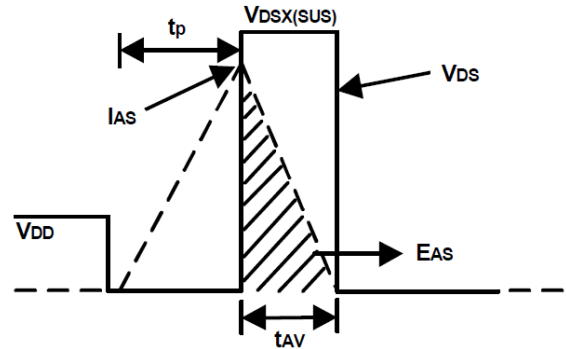
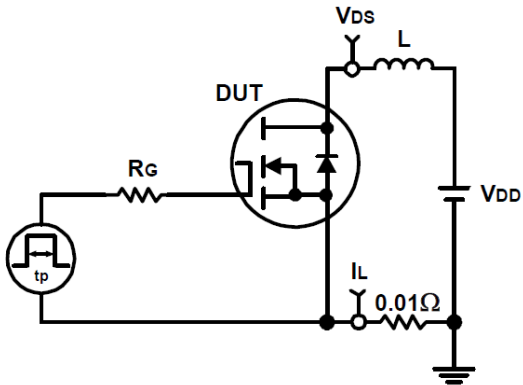
15. Transfer Characteristics



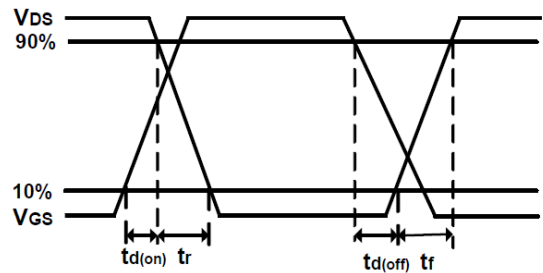
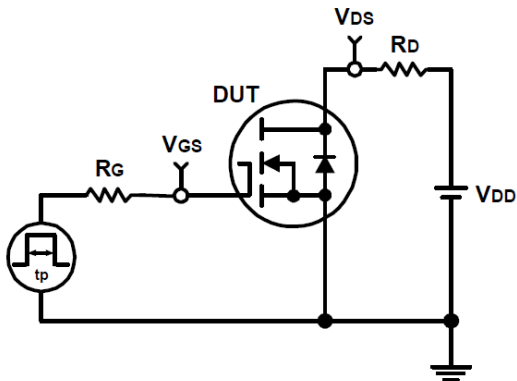


## DETAILED INFORMATION

### Avalanche Test Circuit and Waveforms



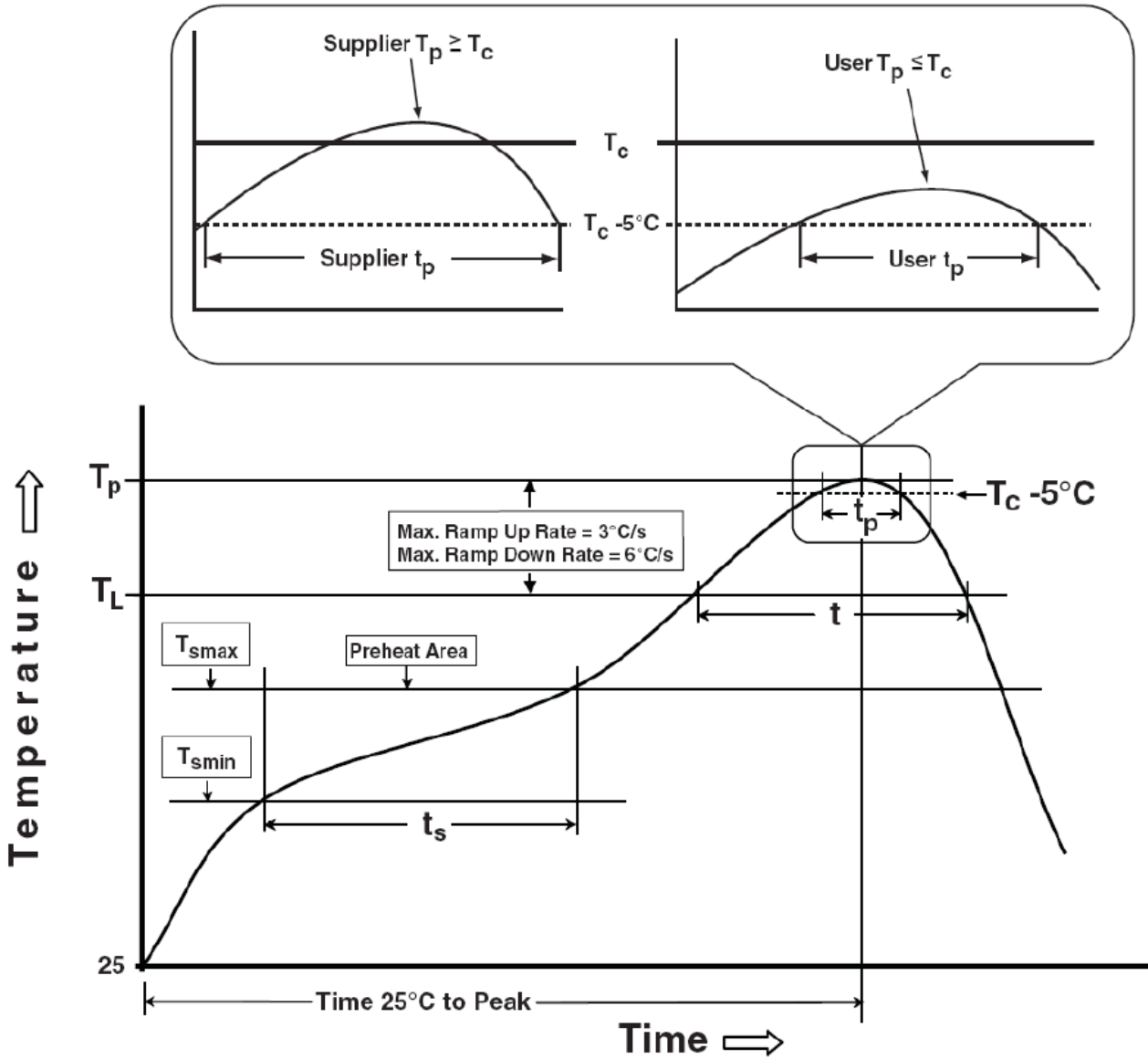
### Switching Time Test Circuit and Waveforms







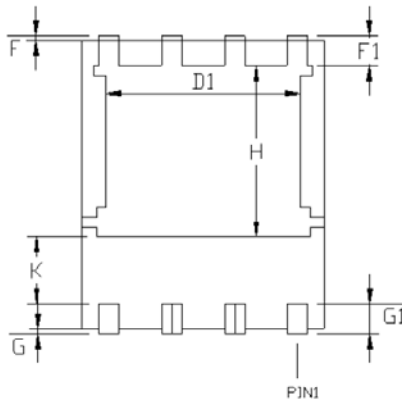
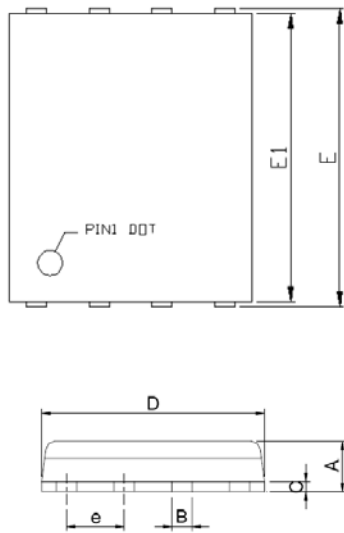
CLASSIFICATION PROFILE



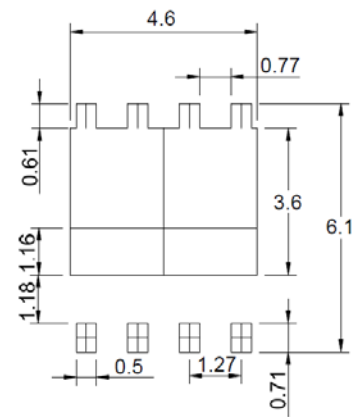


**PACKAGE INFORMATION**

Dimension in DFN8 (Unit: mm)



**RECOMMENDED LAND PATTERN**



UNIT: mm

Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.90	1.20	0.035	0.047
B	0.30	0.51	0.012	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.30	0.189	0.209
D1	3.60	4.40	0.141	0.173
E	5.90	6.20	0.232	0.244
E1	5.50	5.80	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.30	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.30	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.90	0.131	0.154
K	0.762	-	0.030	-



## IMPORTANT NOTICE

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