

**P-Channel Enhancement Mode Power MOSFET**

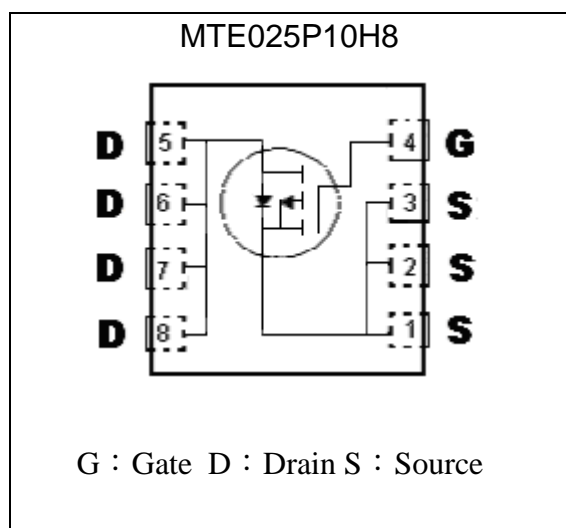
# MTE025P10H8

**Features**

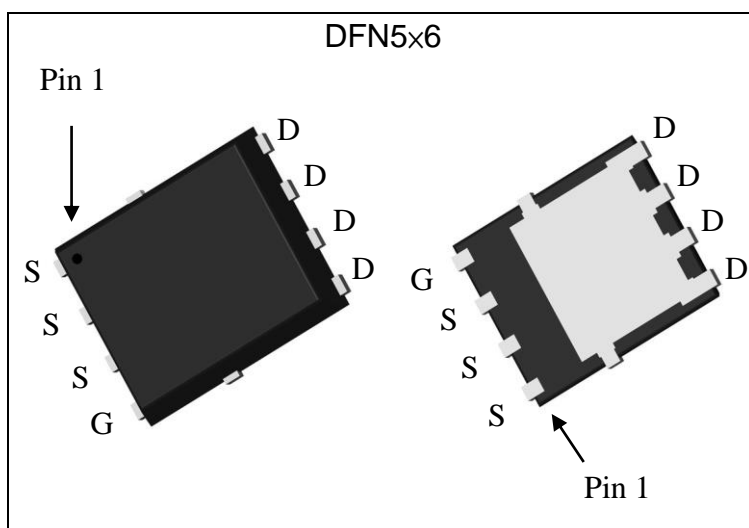
- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Pb-free lead plating and Halogen-free package

BV <sub>DSS</sub>		-100V
I <sub>D</sub> @ V <sub>GS</sub> =-10V, T <sub>C</sub> =25°C		-36A
I <sub>D</sub> @ V <sub>GS</sub> =-10V, T <sub>A</sub> =25°C		-7A
R <sub>DS(on)(TYP)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A	22mΩ

**Symbol**

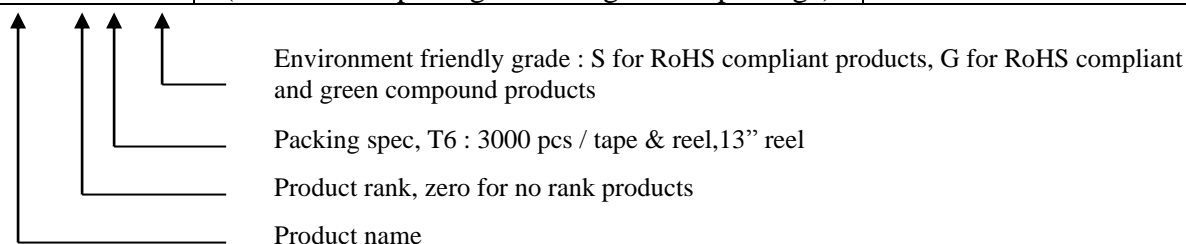


**Outline**



**Ordering Information**

Device	Package	Shipping
MTE025P10H8-0-T6-G	DFN5x6 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel





**Absolute Maximum Ratings** (T<sub>C</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage	V <sub>DS</sub>	-100	V	
Gate-Source Voltage	V <sub>GS</sub>	±20		
Continuous Drain Current @ T <sub>C</sub> =25°C, V <sub>GS</sub> =-10V	I <sub>D</sub>	-36	A	
Continuous Drain Current @ T <sub>C</sub> =100°C, V <sub>GS</sub> =-10V		-22.7		
Continuous Drain Current @ T <sub>A</sub> =25°C, V <sub>GS</sub> =-10V *3		-7		
Continuous Drain Current @ T <sub>A</sub> =70°C, V <sub>GS</sub> =-10V *3		-5.6		
Pulsed Drain Current *1, 2	I <sub>DM</sub>	-144		
Avalanche Current @ L=0.1mH	I <sub>AS</sub>	-44		
Avalanche Energy @ L=0.5mH, I <sub>D</sub> =-24A, V <sub>GS</sub> =-10V *4	E <sub>AS</sub>	144	mJ	
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> =25°C	78	W
		T <sub>C</sub> =100°C	31.2	
		T <sub>A</sub> =25°C *3	3.0	
		T <sub>A</sub> =70°C *3	1.9	
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55~+150	°C	

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-ambient, max *3	R <sub>θJA</sub>	42	°C/W
Thermal Resistance, Junction-to-case, max	R <sub>θJC</sub>	1.6	

- Note : 1. Pulse width limited by maximum junction temperature.  
 2. Duty cycle ≤ 1%.  
 3. Surface mounted on 1 in<sup>2</sup> copper pad of FR-4 board; 135°C/W when mounted on minimum pad of 2 oz. copper.  
 4. 100% tested by conditions of L=0.5mH, V<sub>GS</sub>=-10V, I<sub>AS</sub>=-9A, V<sub>DD</sub>=-50V

**Characteristics (T<sub>C</sub>=25°C, unless otherwise specified)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	-100	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA
V <sub>GS(th)</sub>	-2	-	-4		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA
G <sub>FS</sub> *1	-	25.5	-	S	V <sub>DS</sub> =-5V, I <sub>D</sub> =-10A
I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
I <sub>DSS</sub>	-	-	-1	μA	V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V
	-	-	-5		V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V, T <sub>j</sub> =55°C
R <sub>DS(ON)</sub> *1	-	22	30	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A
<b>Dynamic *4</b>					
C <sub>iss</sub>	-	4658	-	pF	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, f=1MHz
C <sub>oss</sub>	-	263	-		
C <sub>rss</sub>	-	162	-		

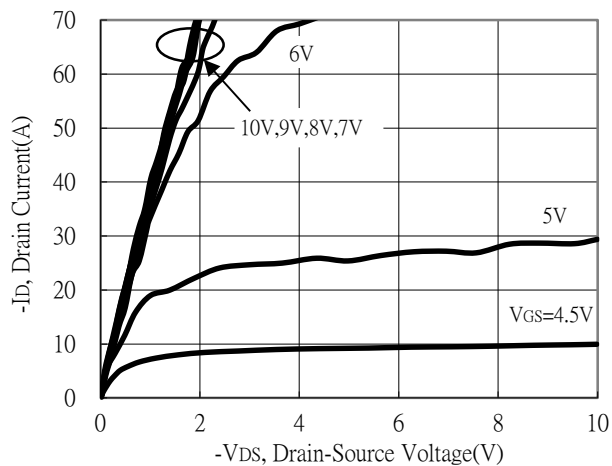


Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Qg *1, 2	-	78	-	nC	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A
Qgs *1, 2	-	21	-		
Qgd *1, 2	-	21	-		
t <sub>d(ON)</sub> *1, 2	-	28	-	ns	V <sub>DS</sub> =-50V, I <sub>D</sub> =-1A, V <sub>GS</sub> =-10V R <sub>G</sub> =6Ω
t <sub>r</sub> *1, 2	-	27	-		
t <sub>d(OFF)</sub> *1, 2	-	154	-		
t <sub>f</sub> *1, 2	-	49	-		
R <sub>g</sub>	-	6.5	-	Ω	f=1MHz
<b>Source-Drain Diode</b>					
I <sub>s</sub> *1	-	-	-7	A	
I <sub>SM</sub> *3	-	-	-28		
V <sub>SD</sub> *1	-	-0.84	-1.2	V	I <sub>S</sub> =-7A, V <sub>GS</sub> =0V
t <sub>rr</sub>	-	35	-	ns	I <sub>F</sub> =-7A, dI <sub>F</sub> /dt=100A/μs
Q <sub>rr</sub>	-	59	-	nC	

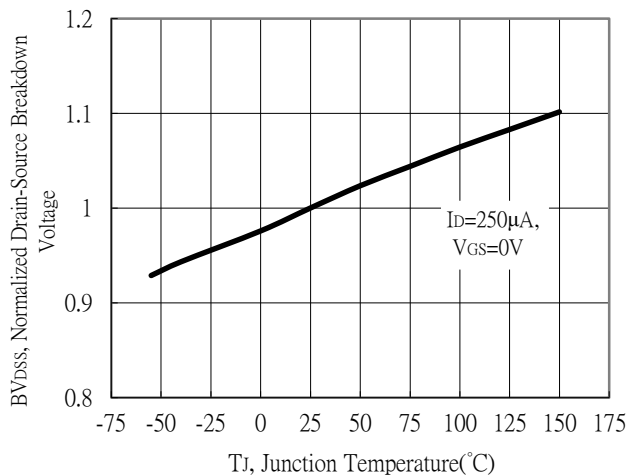
- Note : \*1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%  
\*2.Independent of operating temperature  
\*3.Pulse width limited by maximum junction temperature.  
\*4.Guaranteed by design, not subject to production testing.

## Typical Characteristics

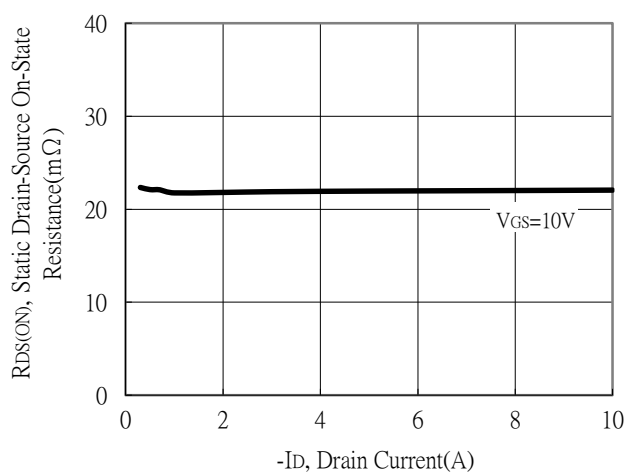
Typical Output Characteristics



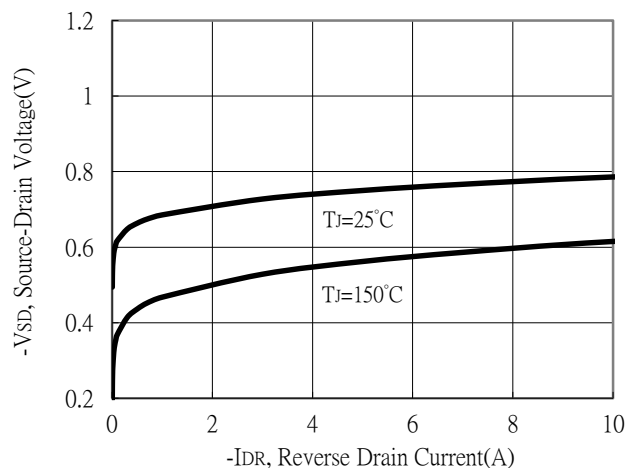
Brekdown Voltage vs Ambient Temperature



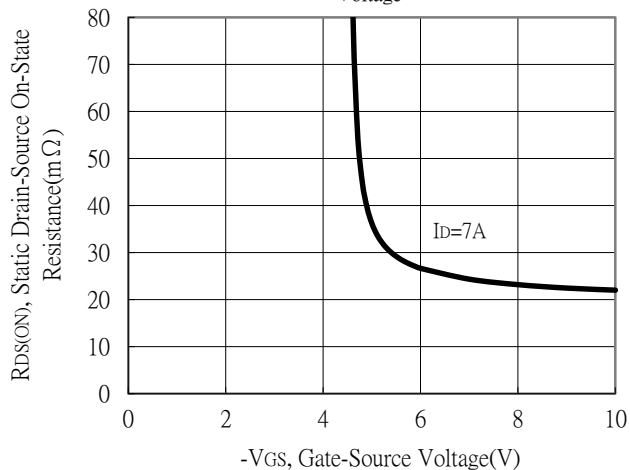
Static Drain-Source On-State resistance vs Drain Current



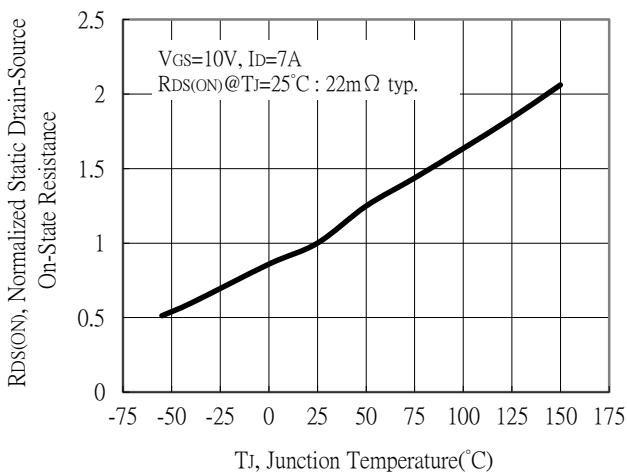
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

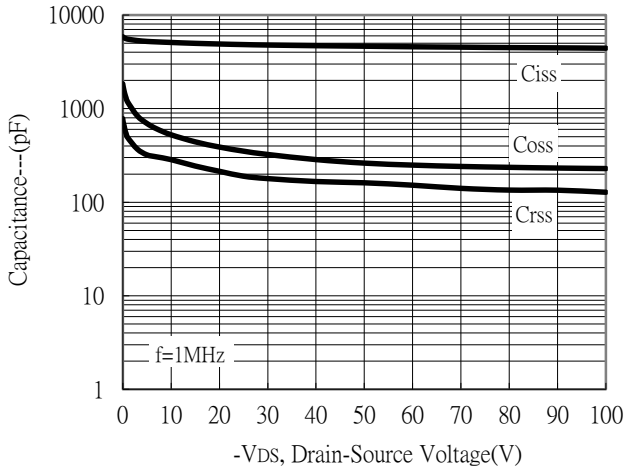


Drain-Source On-State Resistance vs Junction Temperature

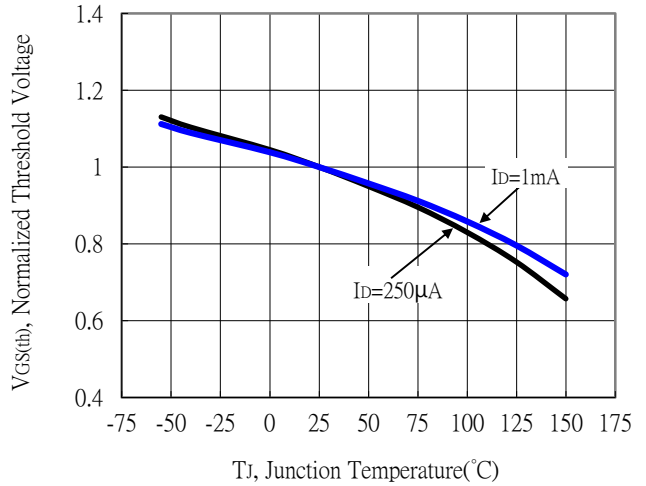


## Typical Characteristics(Cont.)

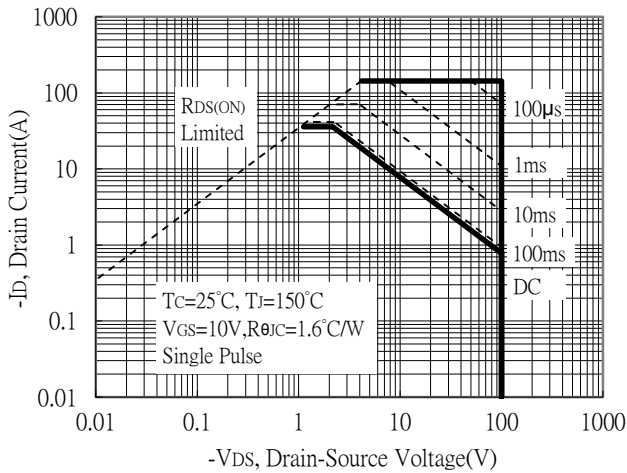
Capacitance vs Drain-to-Source Voltage



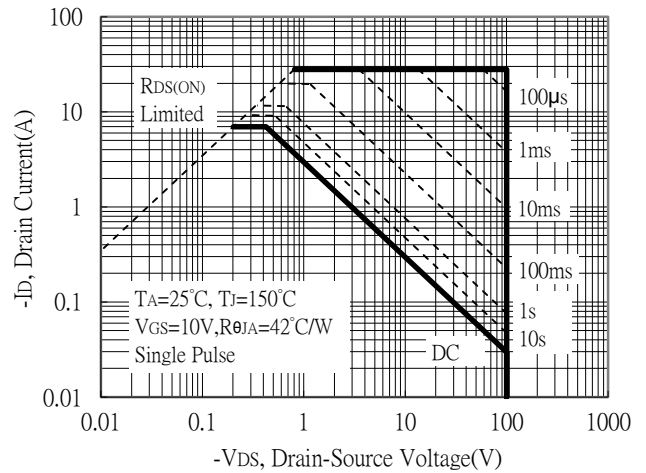
Threshold Voltage vs Junction Temperature



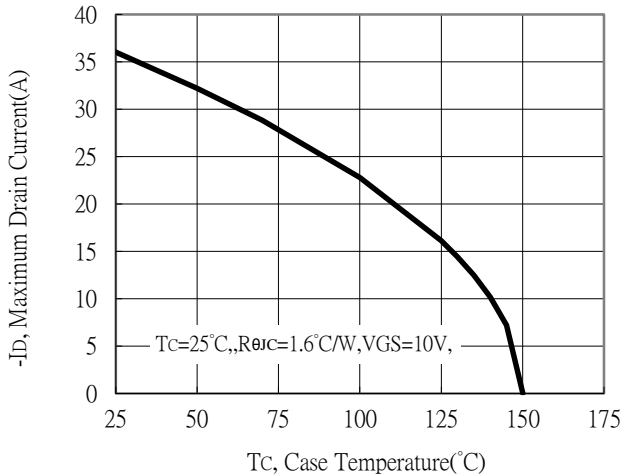
Maximum Safe Operating Area



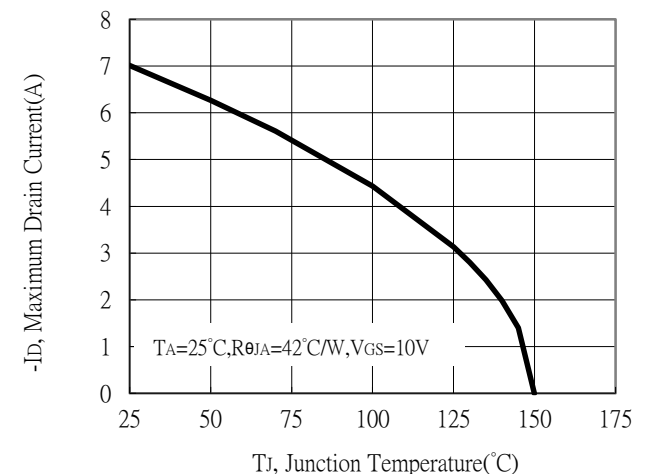
Maximum Safe Operating Area



Maximum Drain Current vs Case Temperature

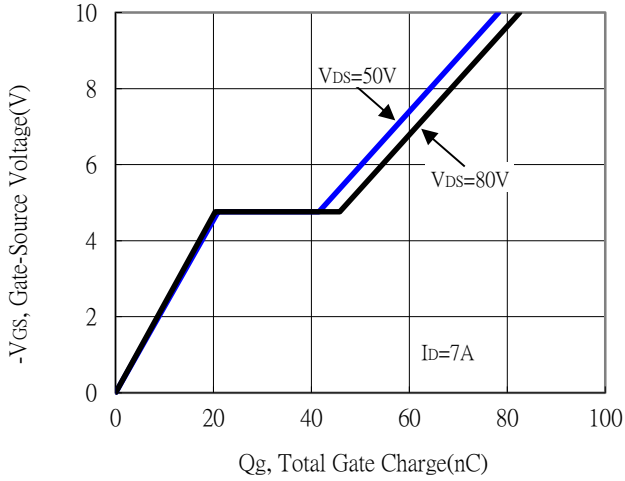


Maximum Drain Current vs Junction Temperature

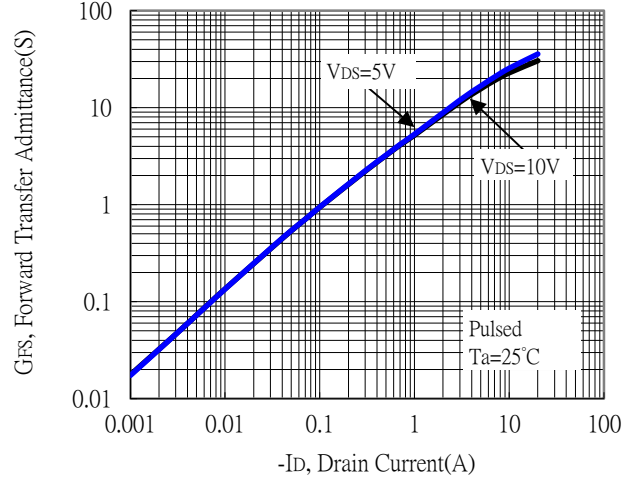


**Typical Characteristics(Cont.)**

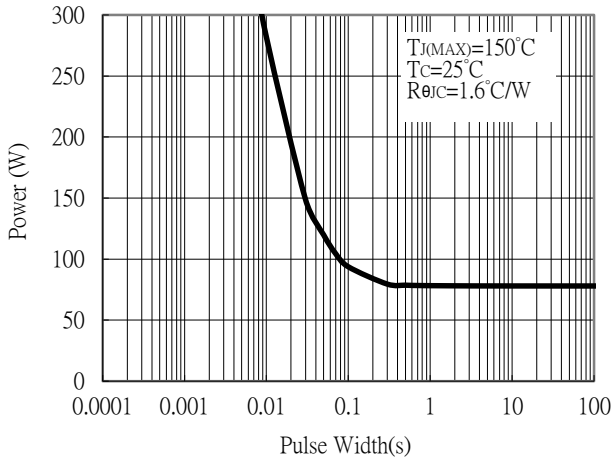
Gate Charge Characteristics



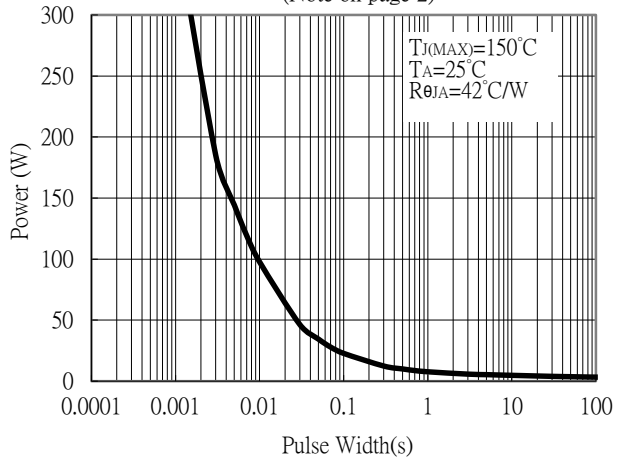
Forward Transfer Admittance vs Drain Current



Single Pulse Power Rating, Junction to Case

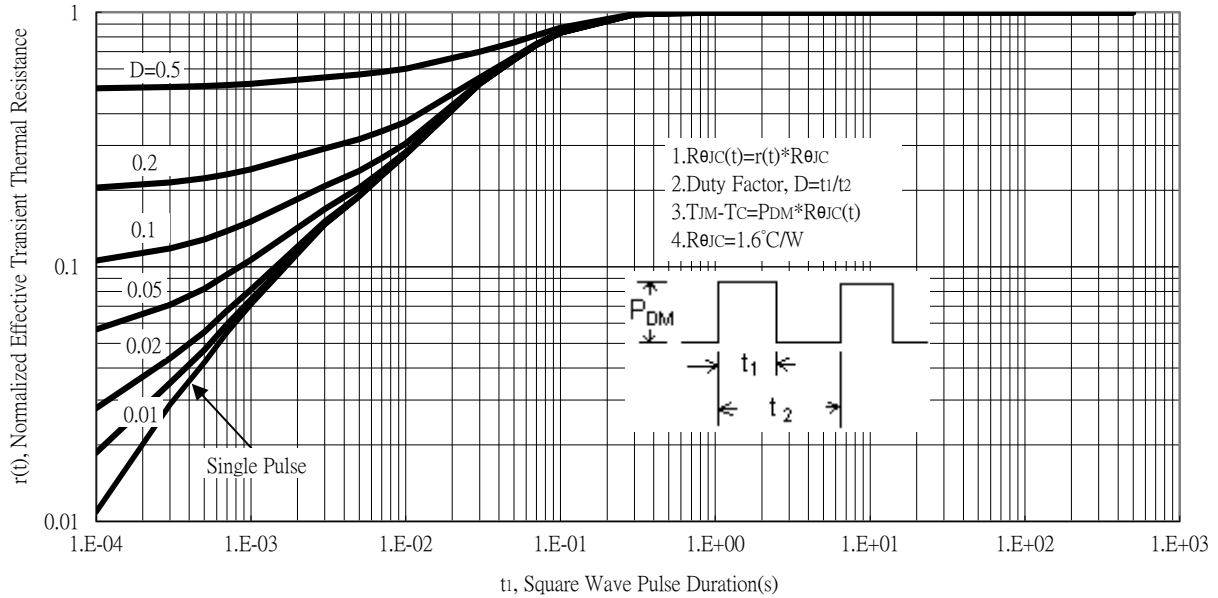


Single Pulse Power Rating, Junction to Ambient  
 (Note on page 2)

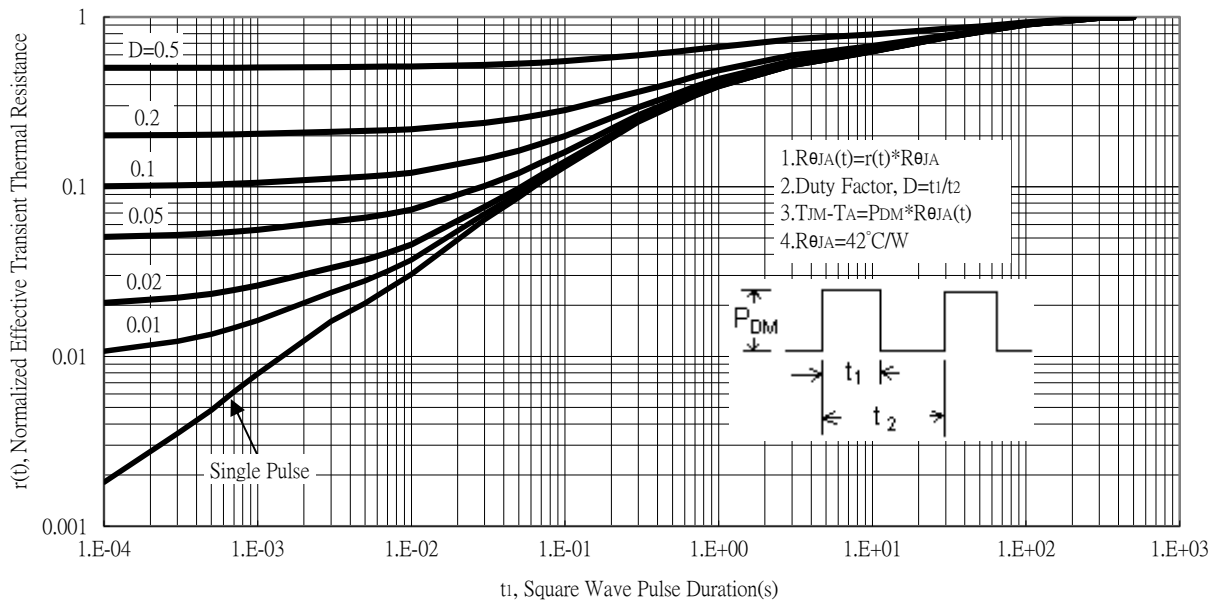


**Typical Characteristics(Cont.)**

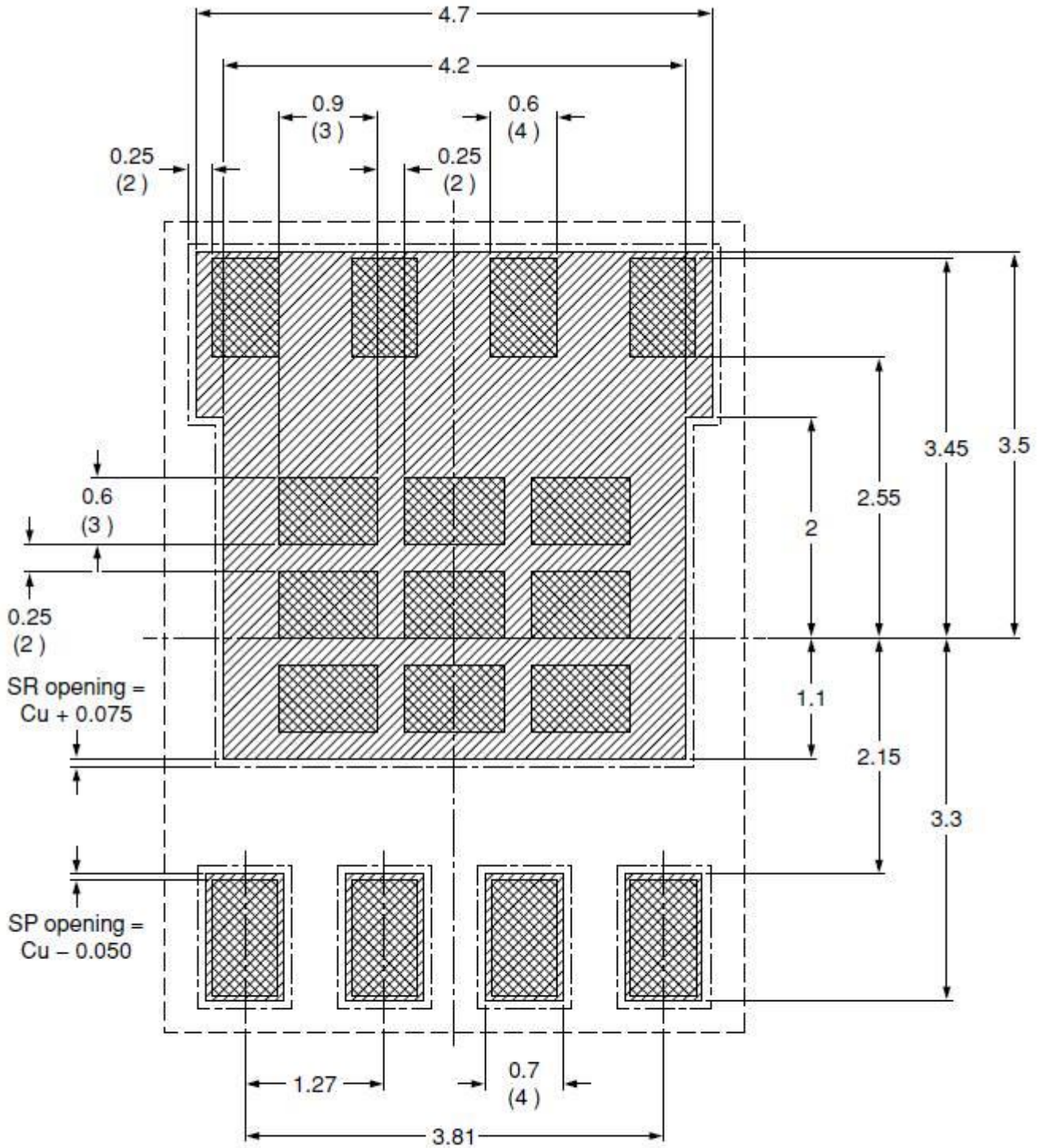
Transient Thermal Response Curves




Transient Thermal Response Curves



**Recommended Soldering Footprint & Stencil Design**

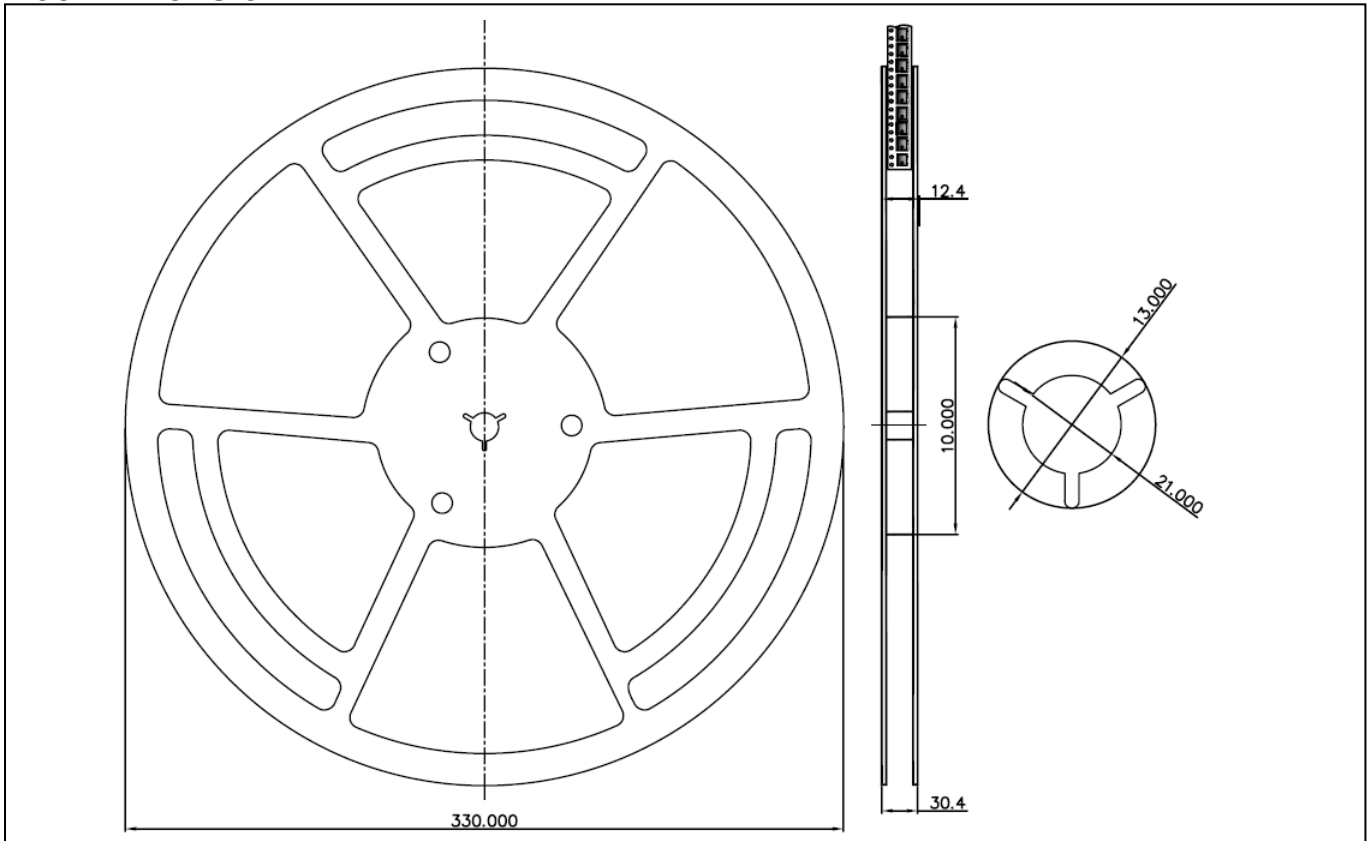


- |   |               |   |                                     |
|---|---------------|---|-------------------------------------|
|  | solder lands  |  | solder paste<br>125 $\mu$ m stencil |
|  | solder resist |  | occupied area                       |

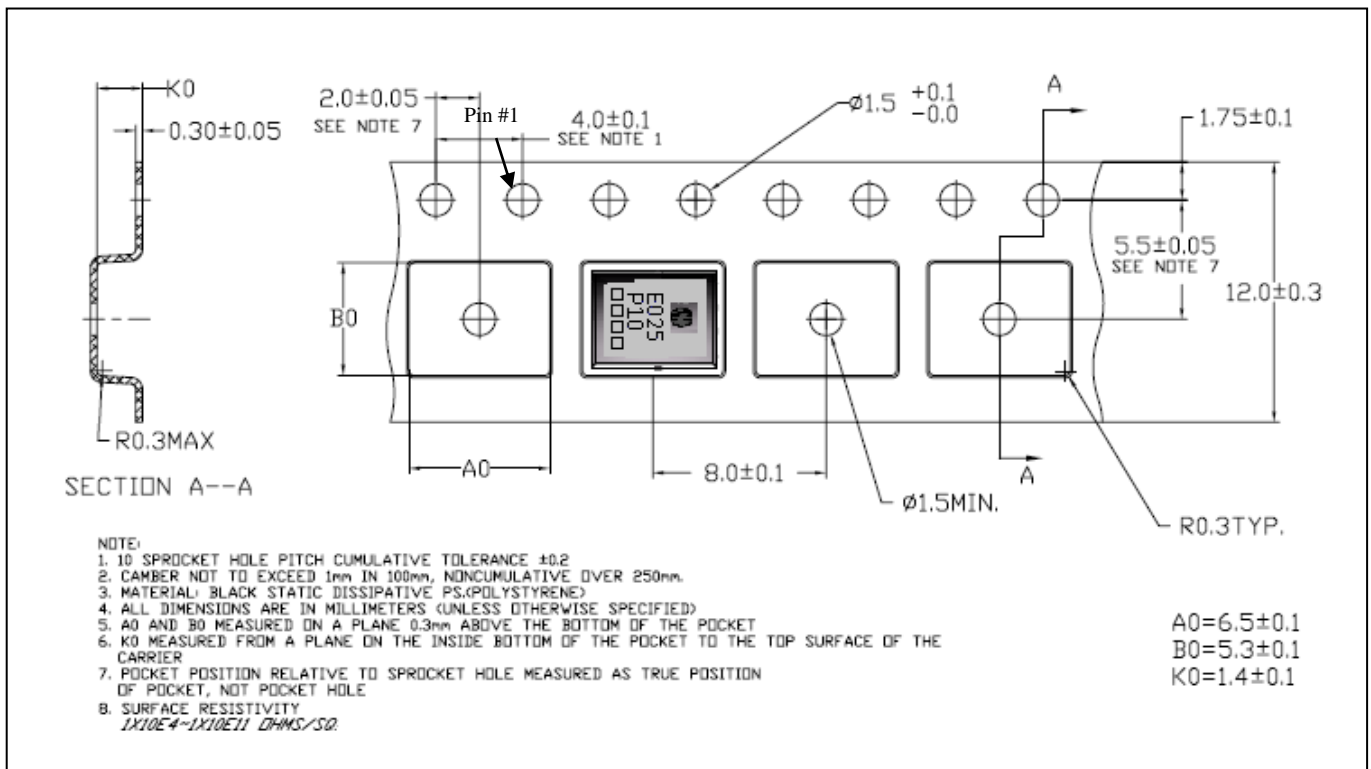
unit : mm



**Reel Dimension**

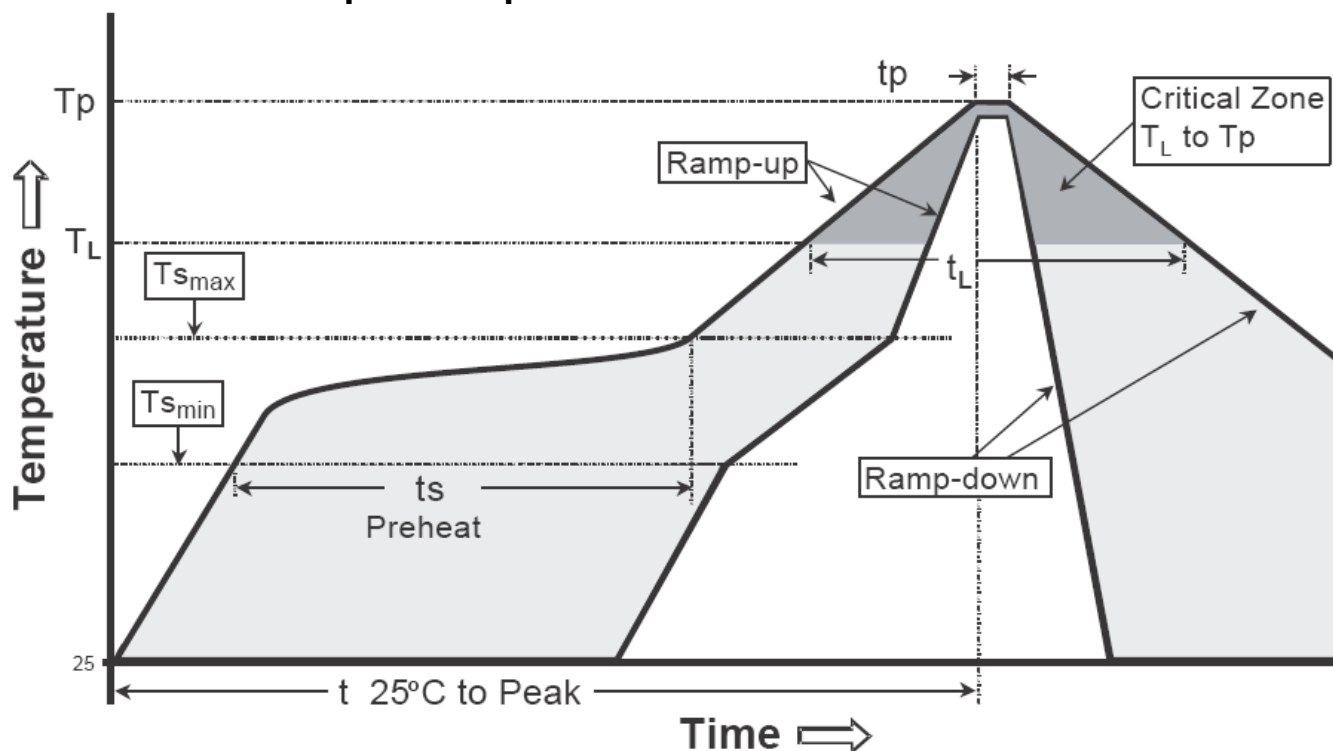


**Carrier Tape Dimension**



**Recommended wave soldering condition**

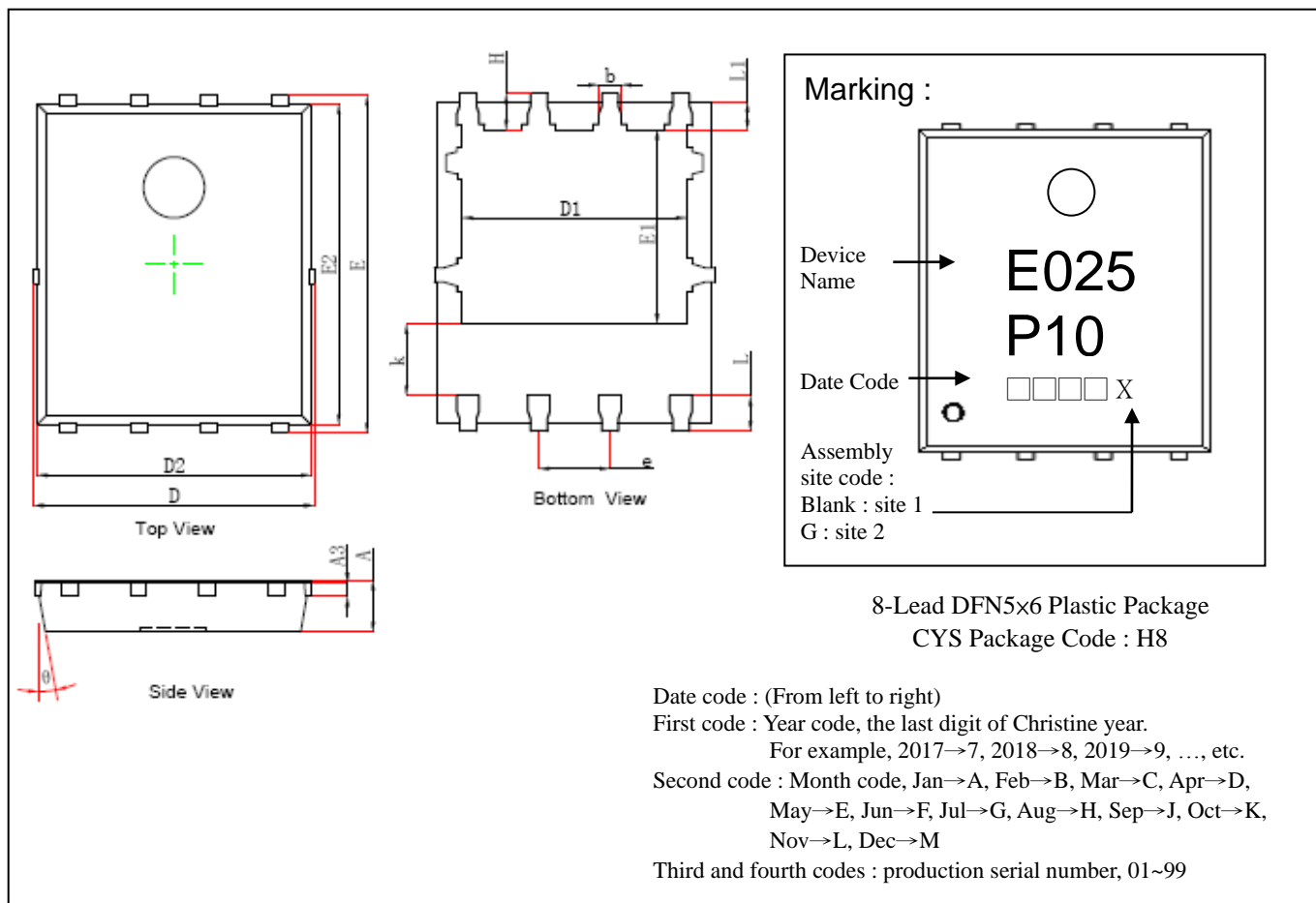
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

**Recommended temperature profile for IR reflow**


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

## DFN5x6 Dimension



**Marking :**

Device Name → **E025**  
**P10**

Date Code → □□□□ X

Assembly site code :  
 Blank : site 1  
 G : site 2

**8-Lead DFN5x6 Plastic Package**  
 CYS Package Code : H8

Date code : (From left to right)  
 First code : Year code, the last digit of Christine year.  
 For example, 2017→7, 2018→8, 2019→9, ..., etc.  
 Second code : Month code, Jan→A, Feb→B, Mar→C, Apr→D,  
 May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct→K,  
 Nov→L, Dec→M  
 Third and fourth codes : production serial number, 01~99

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	k	1.100	-	0.043	-
A3	0.200	0.300	0.008	0.012	b	0.330	0.510	0.013	0.020
D	4.944	5.096	0.195	0.201	e	1.270 TYP.		0.050 TYP.	
E	5.900	6.126	0.232	0.241	L	0.510	0.711	0.020	0.028
D1	3.670	4.110	0.144	0.162	L1	0.310	0.576	0.012	0.023
E1	3.375	3.780	0.133	0.149	H	0.410	0.726	0.016	0.029
D2	4.800	5.000	0.189	0.197	θ	8°	12°	8°	12°
E2	5.674	5.826	0.223	0.229					

**Notes:** 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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