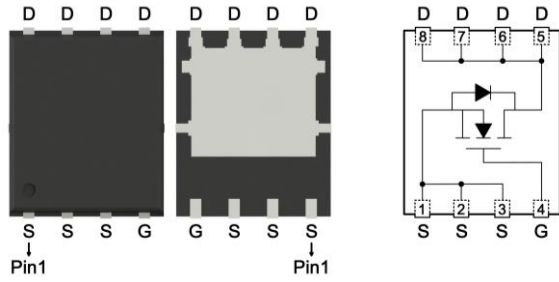


## Product Summary

$BV_{DSS}$	100	V
$R_{DS(ON)}$ typ. @ $V_{GS}=10V, I_D=10A$	6.2	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=5V, I_D=8A$	8	
$I_D$ @ $V_{GS}=10V, T_C=25^\circ C$	66	A
$I_D$ @ $V_{GS}=10V, T_A=25^\circ C$	11	

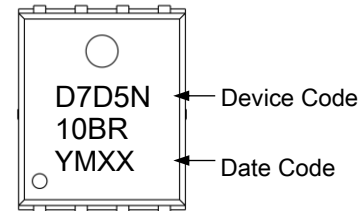
## DFN5×6



## Features

- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

## Marking



YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

## Ordering Information

Device	Package	Shipping
MTD7D5N10BRH8-0-T6-G	DFN5×6	3000pcs / Tape & Reel

0: Product rank, zero for no rank products.

T6: Packing spec, T6: 3000pcs / tape & reel, 13" reel.

G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

## Absolute Maximum Ratings ( $T_A=25^\circ C$ )

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DS}$	100	V	
Gate-Source Voltage	$V_{GS}$	±20		
Continuous Drain Current @ $V_{GS}=10V, T_C=25^\circ C$	$I_D$	66	A	
Continuous Drain Current @ $V_{GS}=10V, T_C=100^\circ C$		42		
Continuous Drain Current @ $V_{GS}=10V, T_A=25^\circ C$		11		
Continuous Drain Current @ $V_{GS}=10V, T_A=70^\circ C$		8.8		
Pulsed Drain Current	$I_{DM}$	264		
Continuous Body Diode Forward Current @ $T_C=25^\circ C$	$I_S$	66		
Pulsed Body Diode Forward Current @ $T_C=25^\circ C$	$I_{SM}$	264		
Avalanche Current @ $L=0.1mH$	$I_{AS}$	32		
Avalanche Energy @ $L=0.5mH$	$E_{AS}$	81	mJ	
Total Power Dissipation	$P_D$	$T_C=25^\circ C$	89	W
		$T_C=100^\circ C$	36	
		$T_A=25^\circ C$	2.8	
		$T_A=70^\circ C$	1.8	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~+150	°C	
Steady State Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.4	°C/W	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	45		



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

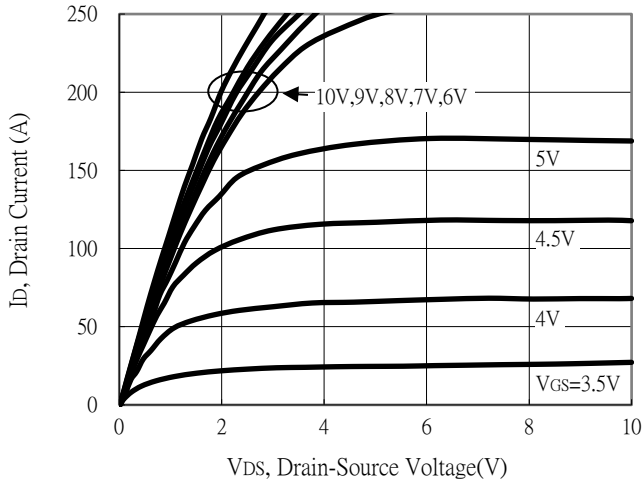
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	100	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	1.5	-	2.5		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
G <sub>FS</sub>	-	27	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =10A
I <sub>GSS</sub>	-	-	±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
R <sub>DS(ON)</sub>	-	6.2	8.5	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =10A
	-	8	13		V <sub>GS</sub> =5V, I <sub>D</sub> =8A
<b>Dynamic</b>					
C <sub>iSS</sub>	-	3580	-	pF	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz
C <sub>oss</sub>	-	355	-		
C <sub>rSS</sub>	-	38	-		
R <sub>g</sub>	-	0.8	-	Ω	f=1MHz
Q <sub>g</sub> *d,e	-	31	-	nC	V <sub>DS</sub> =50V, I <sub>D</sub> =10A, V <sub>GS</sub> =4.5V
Q <sub>g</sub> *d,e	-	60	-		
Q <sub>gs</sub> *d,e	-	11	-		
Q <sub>gd</sub> *d,e	-	12	-		
t <sub>d(ON)</sub> *d,e	-	25	-	ns	V <sub>DS</sub> =50V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V, R <sub>GS</sub> =6Ω
t <sub>r</sub> *d,e	-	21	-		
t <sub>d(OFF)</sub> *d,e	-	86	-		
t <sub>f</sub> *d,e	-	21	-		
<b>Source-Drain Diode</b>					
V <sub>SD</sub> *d	-	0.8	1.2	V	I <sub>S</sub> =10A, V <sub>GS</sub> =0V
t <sub>rr</sub>	-	42	-	ns	I <sub>F</sub> =10A, di/dt=100A/μs
Q <sub>rr</sub>	-	54	-	nC	

Note:

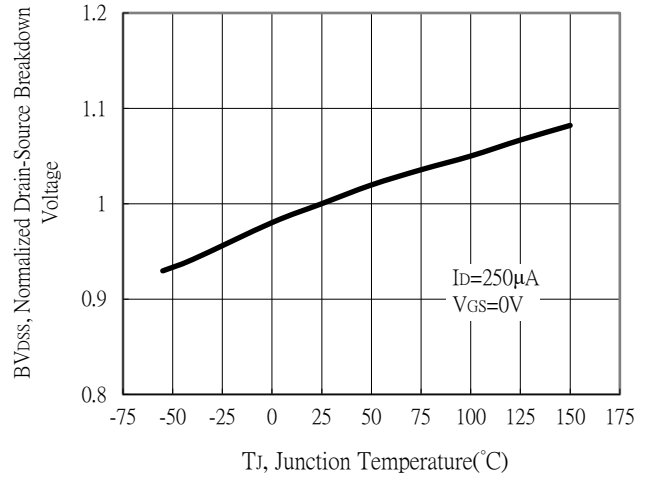
- \*a. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- \*b. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz copper, in a still air environment with T<sub>A</sub>=25°C. The power dissipation P<sub>D</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- \*c. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and low duty cycles to keep initial T<sub>J</sub>=25°C.
- \*d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- \*e. Independent of operating temperature.

## Typical Characteristics

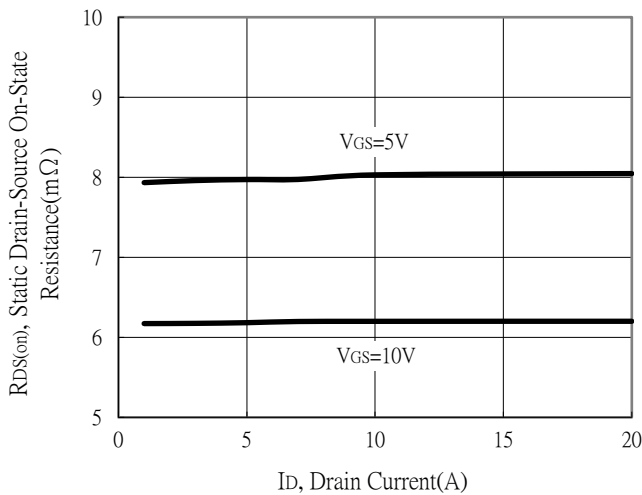
Typical Output Characteristics



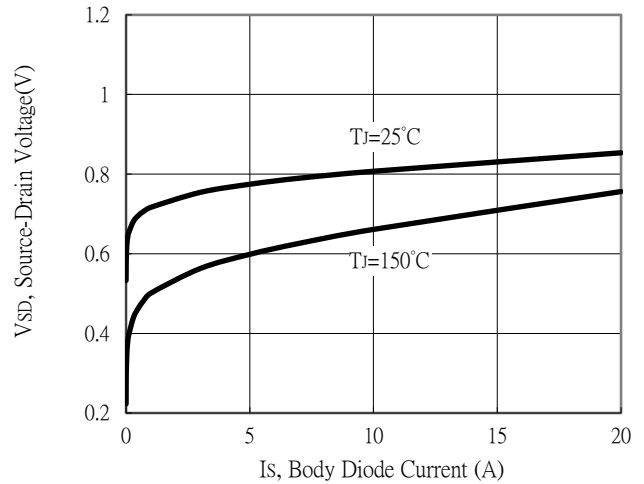
Breakdown Voltage vs Ambient Temperature



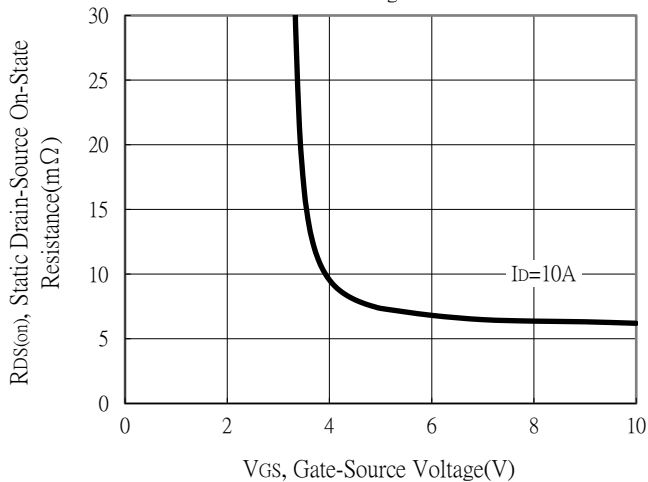
Static Drain-Source On-State resistance vs Drain Current



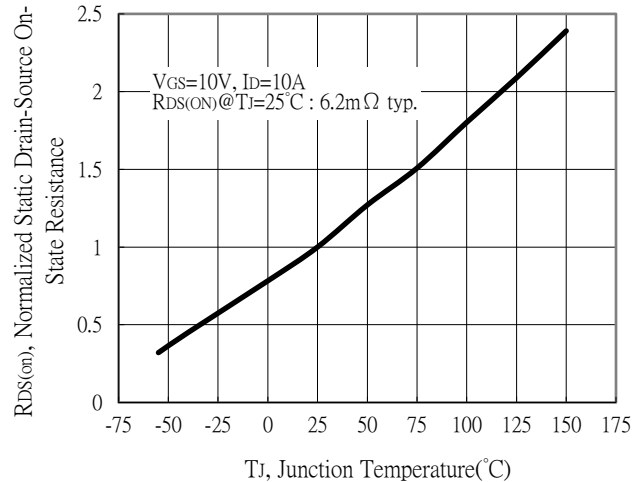
Body Diode Current vs Source-Drain Voltage



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

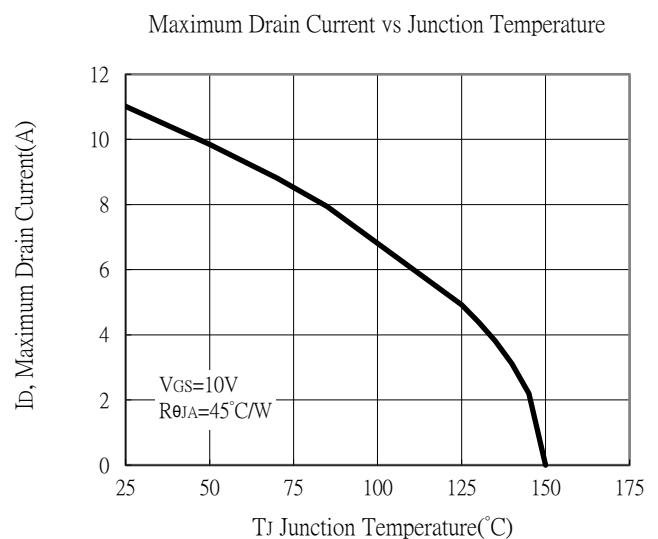
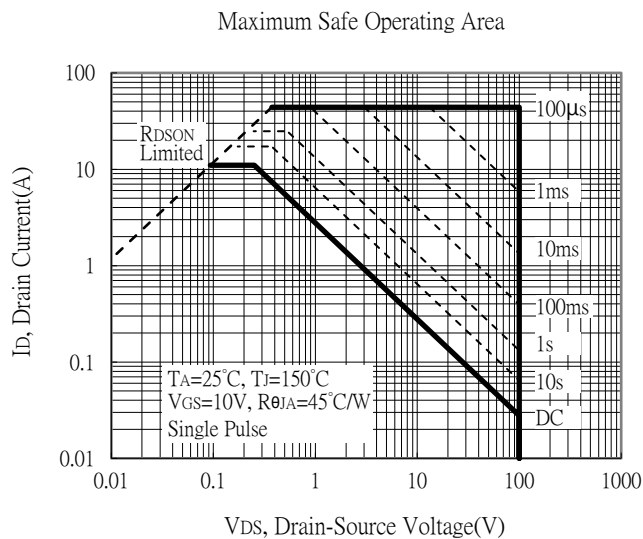
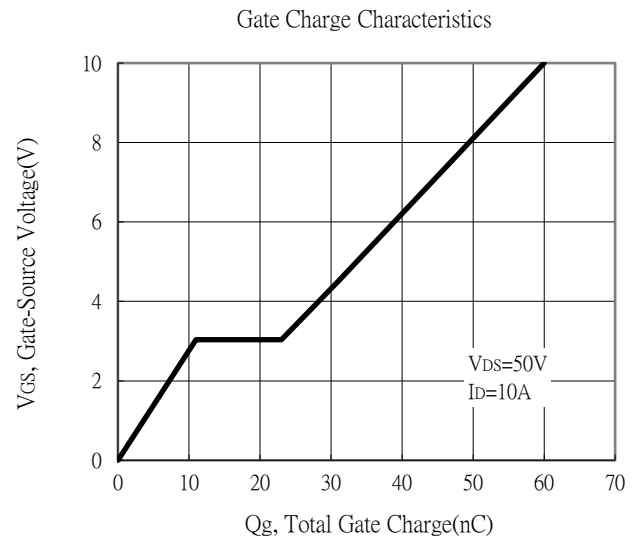
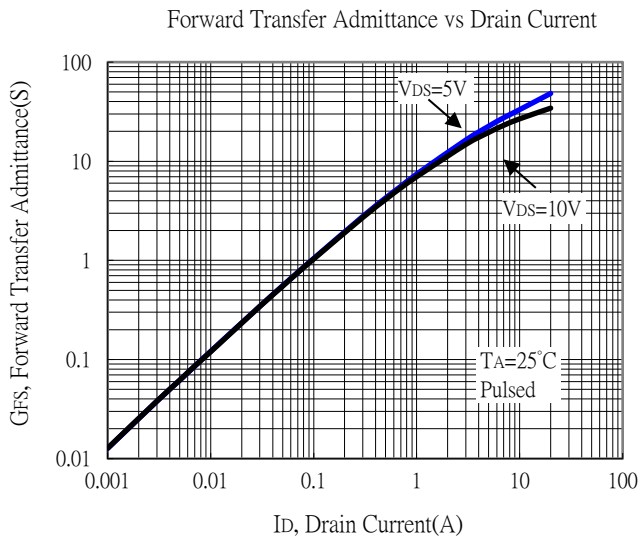
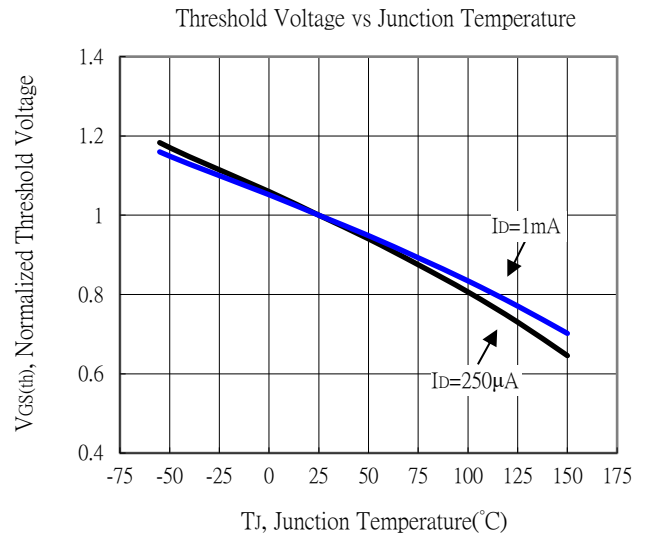
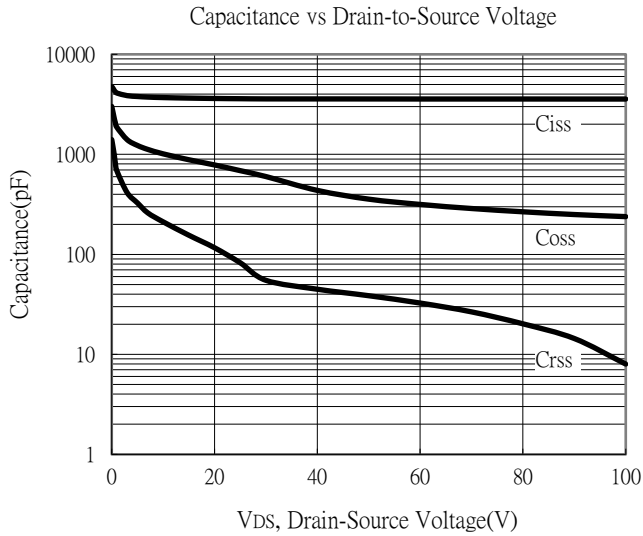


Drain-Source On-State Resistance vs Junction Temperature





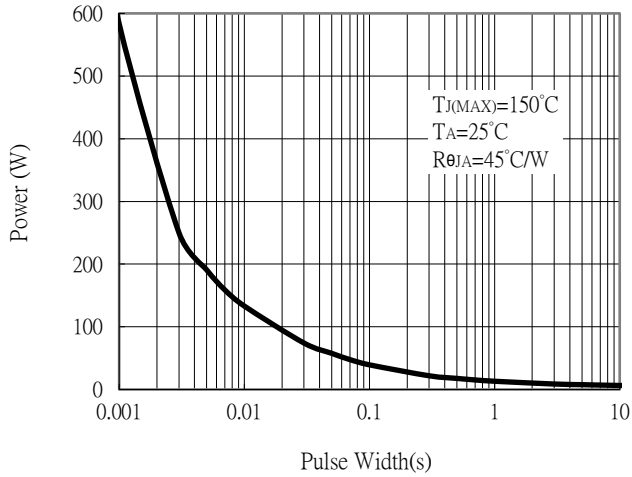
### Typical Characteristics



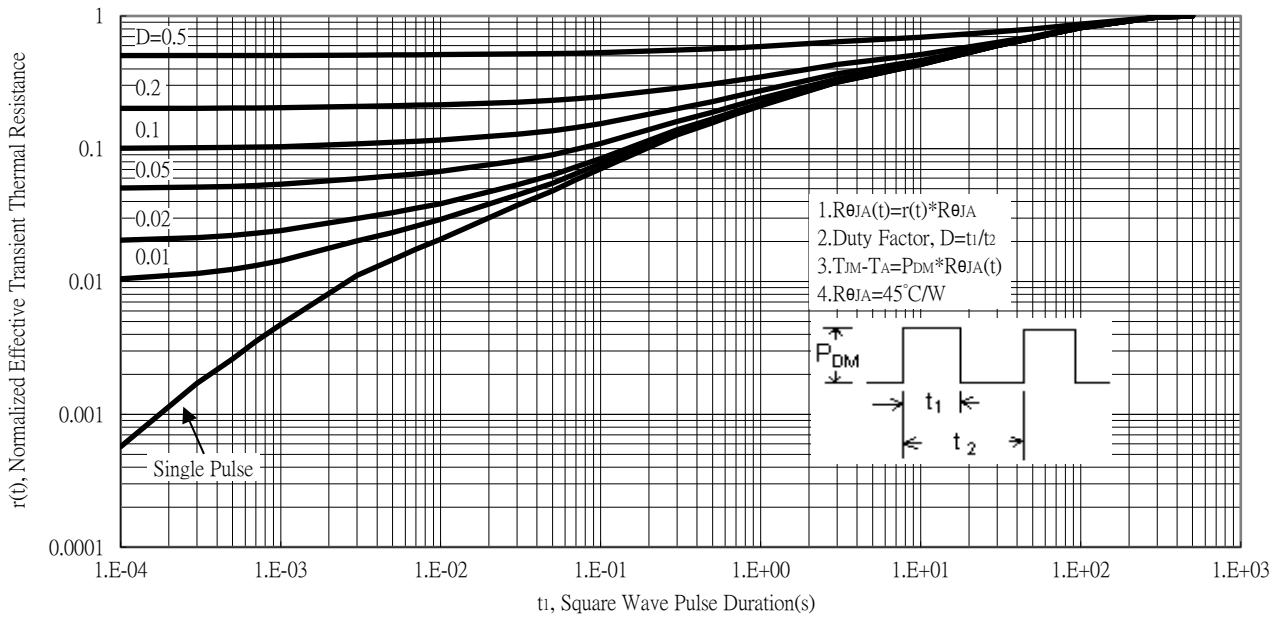


## Typical Characteristics

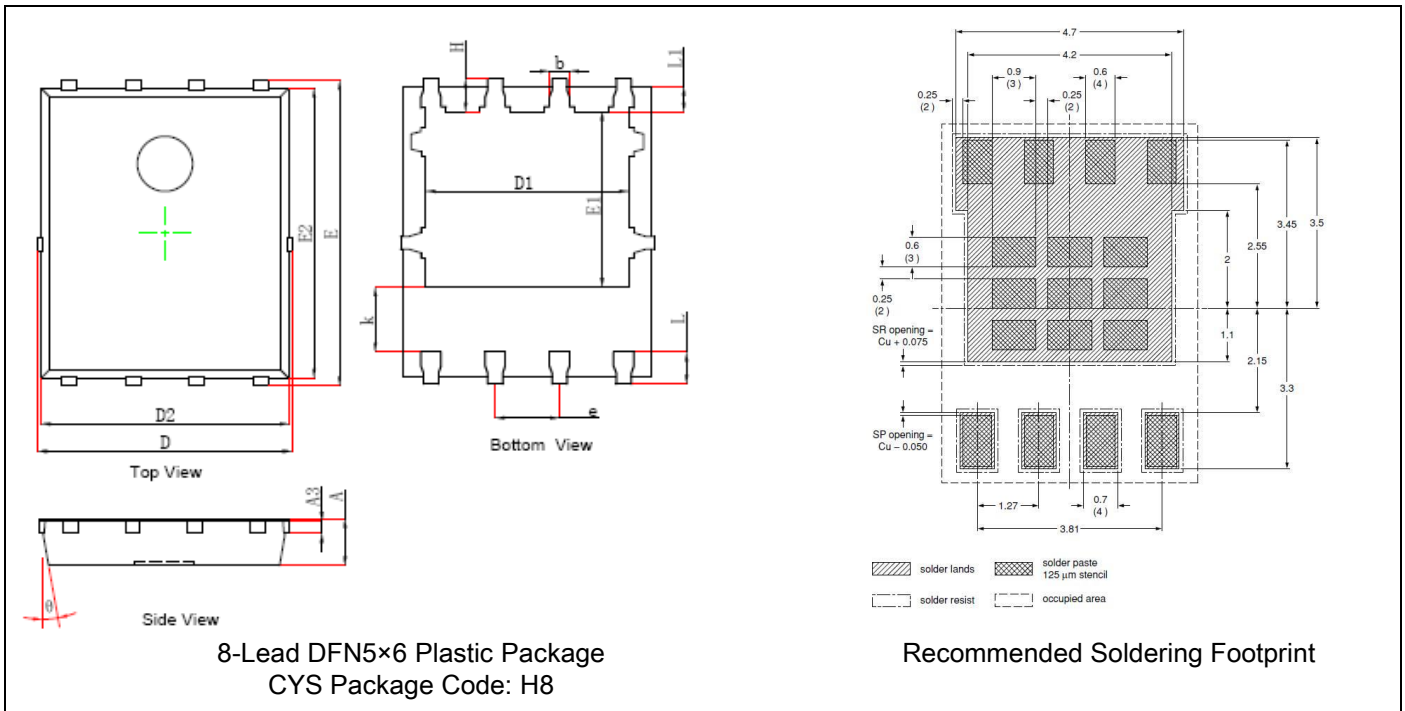
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves



## DFN5×6 Dimension



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.039	0.900	1.000	k	0.047	0.055	1.190	1.390
A3	0.010	REF.	0.254	REF.	b	0.014	0.018	0.350	0.450
D	0.195	0.201	4.944	5.096	e	0.050	TYP.	1.270	TYP.
E	0.235	0.241	5.974	6.126	L	0.020	0.028	0.559	0.711
D1	0.154	0.162	3.910	4.110	L1	0.017	0.023	0.424	0.576
E1	0.133	0.141	3.375	3.575	H	0.023	0.029	0.574	0.726
D2	0.190	0.196	4.824	4.976	θ	8°	12°	8°	12°
E2	0.223	0.229	5.674	5.826					

**Note:**

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

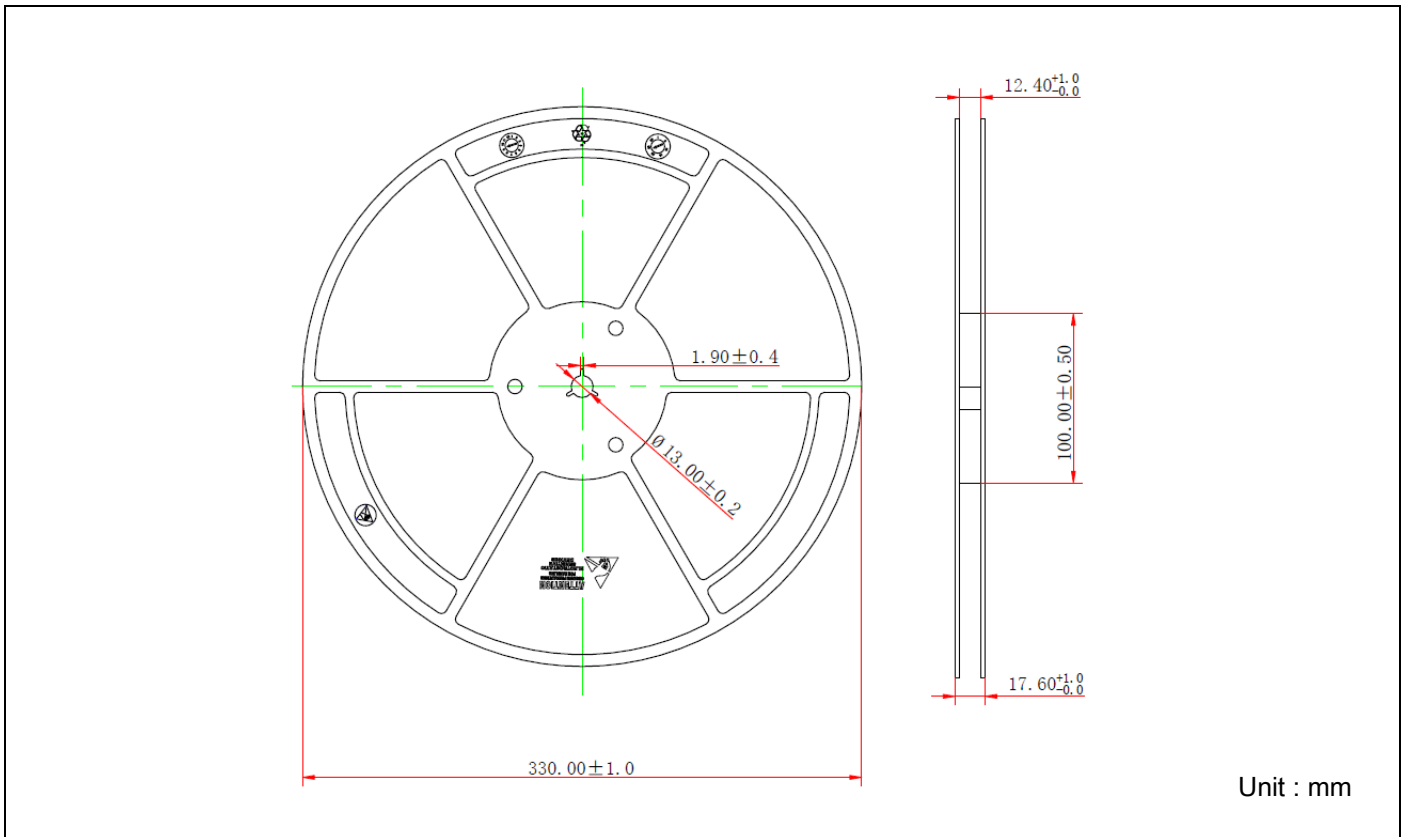
**Material:**

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

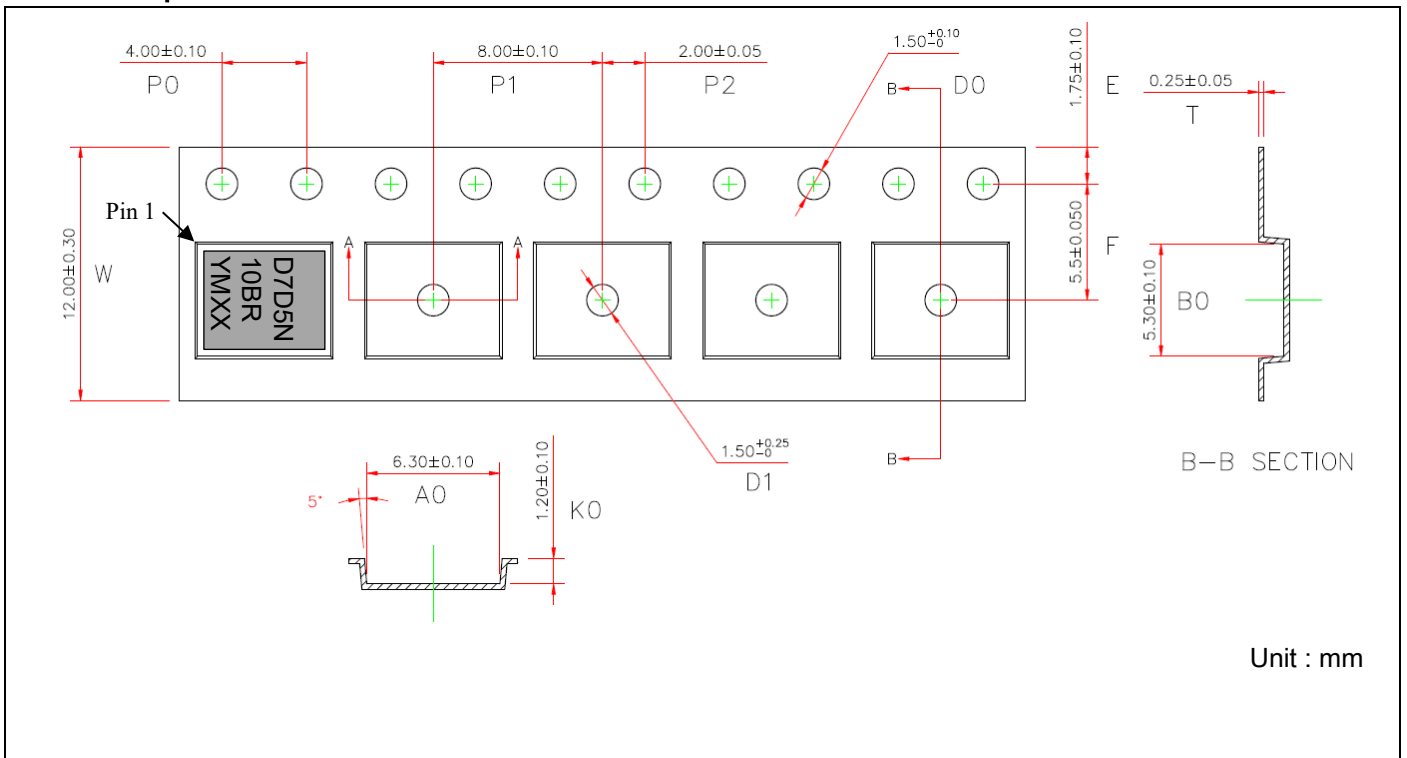
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## Reel Dimension



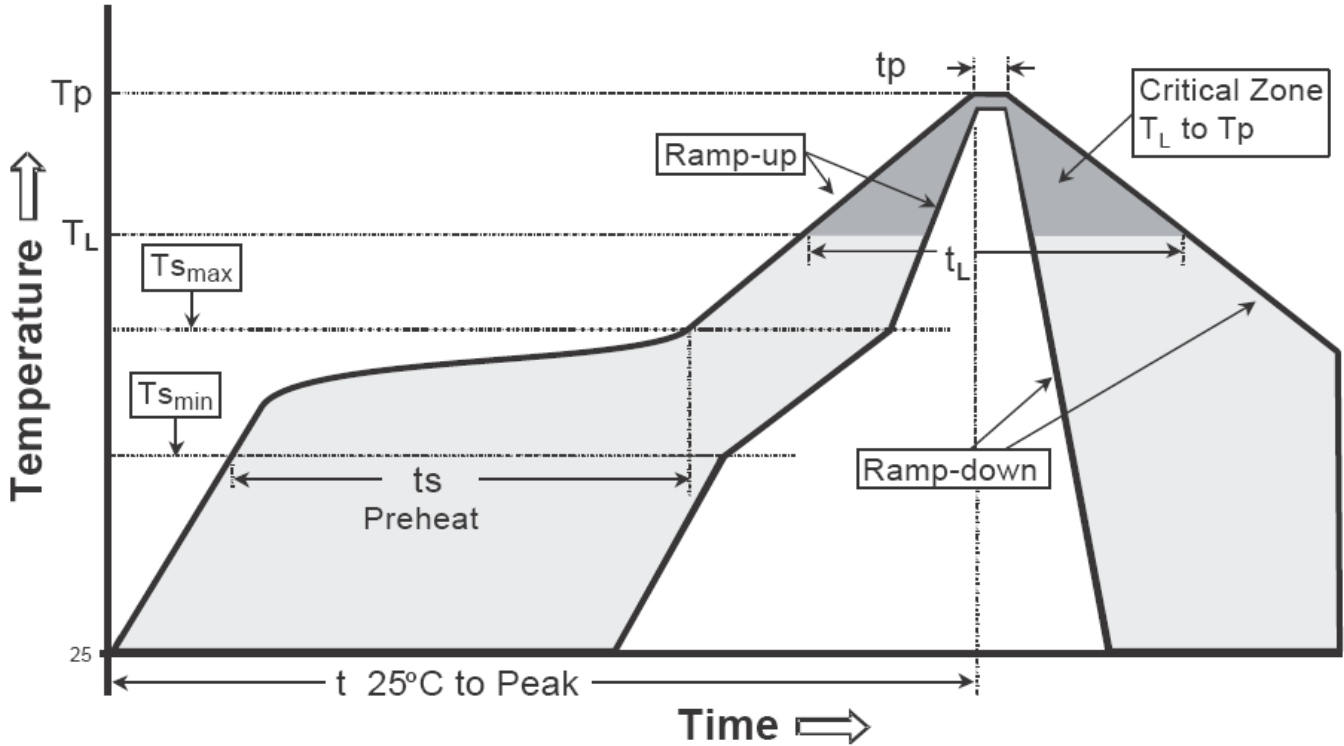
## Carrier Tape Dimension



### 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 (T <sub>S</sub> max to T <sub>P</sub> )	3°C/second max.	3°C/second max.
Preheat -Temperature Min (T <sub>S</sub> min) -Temperature Max (T <sub>S</sub> max) -Time (t <sub>S</sub> min to t <sub>S</sub> max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T <sub>L</sub> ) -Time (t <sub>L</sub> )	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (t <sub>P</sub> )	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
- For devices mounted on FR-4 PCB of 1.6mm or equivalent grade PCB. If other grade PCB is used, care should be taken to match the coefficients of thermal expansion between components and PCB. If they are not matched well, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.