N-Channel Logic Level Enhancement Mode Power MOSFET

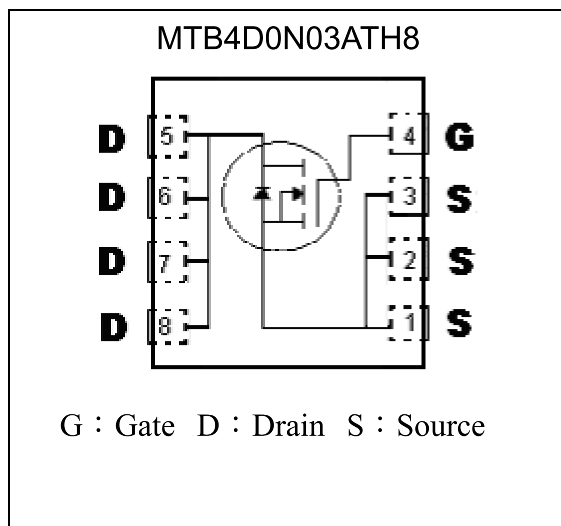
MTB4D0N03ATH8

BV_{DSS}	30V
I_D @V_{GS}=10V	66A
$R_{DS(ON)}$@V_{GS}=10V, I_D=30A	5.3 mΩ(typ)
$R_{DS(ON)}$@V_{GS}=4.5V, I_D=20A	7.5 mΩ(typ)

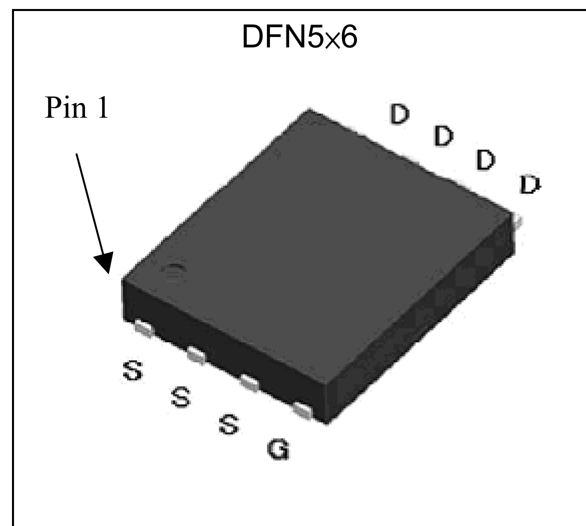
Features

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Dynamic dv/dt rating
- Pb-free lead plating and Halogen-free package

Symbol

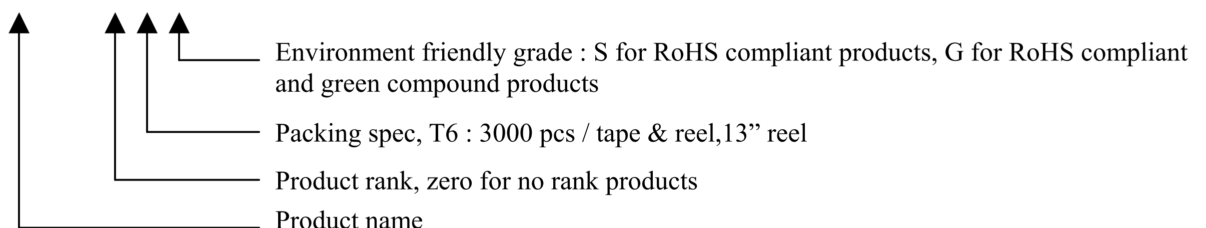


Outline



Ordering Information

Device	Package	Shipping
MTB4D0N03ATH8-0-T6-G	DFN 5 ×6 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ T_C=25°C, V_{GS}=10V		I_D	66	A
Continuous Drain Current @ T_C=100°C, V_{GS}=10V			42	
Pulsed Drain Current		I_{DM}	160 *1	
Avalanche Current		I_{AS}	43	
Avalanche Energy @ L=0.1mH, I_D=43A, R_G=25Ω		E_{AS}	92.5	mJ
Repetitive Avalanche Energy @ L=0.05mH		E_{AR}	5 *2	
Total Power Dissipation	T_C=25℃	P_D	50	W
	T_C=100℃		20	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	50 *3	°C/W

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle≤1%
3. Surface mounted on 1 in² copper pad of FR-4 board, t≤10s; 125°C/W when mounted on minimum copper pad.

Characteristics (T_C=25°C, unless otherwise specified)

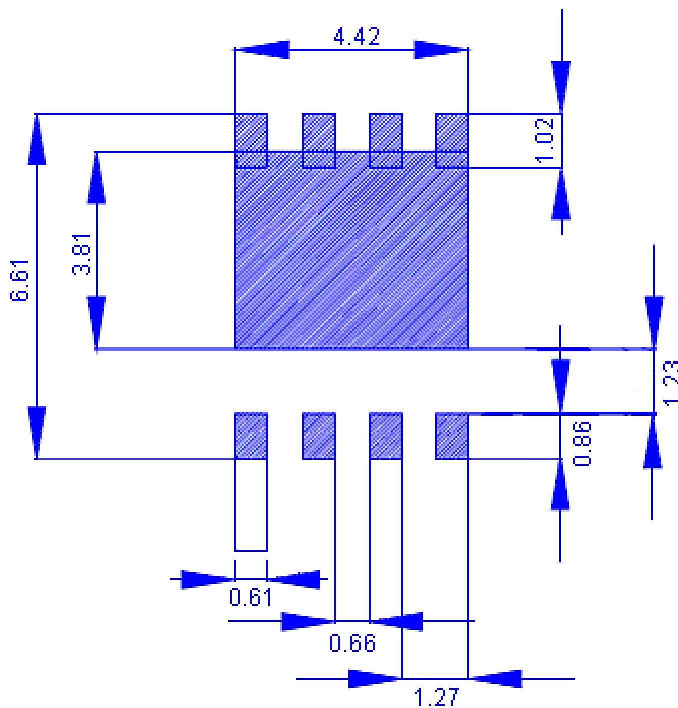
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.0	1.8	2.5	V	V_{DS} = V_{GS}, I_D=250μA
G_{FS} *1	-	25	-	S	V_{DS} =5V, I_D=18A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V
I_{DSS}	-	-	1	μA	V_{DS} =24V, V_{GS} =0V
	-	-	25		V_{DS} =24V, V_{GS} =0V, Tj=125°C
$R_{DS(ON)}$ *1	-	5.3	7.0	mΩ	V_{GS} =10V, I_D=30A
	-	7.5	10.0	mΩ	V_{GS} =4.5V, I_D=20A
Dynamic					
Ciss	-	1511	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Coss	-	299	-		
Crss	-	208	-		

Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Qg (V_{GS}=10V) *1, 2	-	34	-	nC	V_{DS}=15V, V_{GS}=10V, I_D=30A
Qg (V_{GS}=4.5V) *1, 2	-	17	-		
Qgs *1, 2	-	6	-		
Qgd *1, 2	-	9.3	-		
$t_{d(ON)}$ *1, 2	-	7	-	ns	V_{DS}=15V, I_D=24A, V_{GS}=10V, R_{GS}=2.7Ω
tr *1, 2	-	10	-		
$t_{d(OFF)}$ *1, 2	-	22	-		
t_f *1, 2	-	10	-		
Rg	-	4.3	-	Ω	V_{GS}=15mV, V_{DS}=0V, f=1MHz
Source-Drain Diode					
I_S *1	-	-	66	A	
I_{SM} *3	-	-	150		
V_{SD} *1	-	0.81	1.2	V	I_S=18A, V_{GS}=0V
trr	-	14.5	-	ns	I_F=18A, dI_F/dt=100A/μs
Qrr	-	7.3	-	nC	

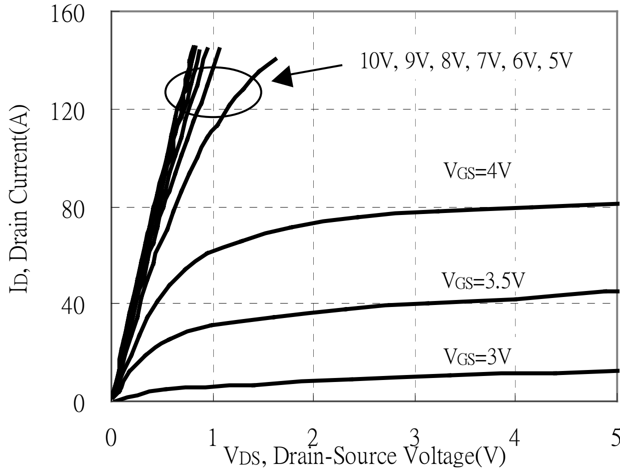
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

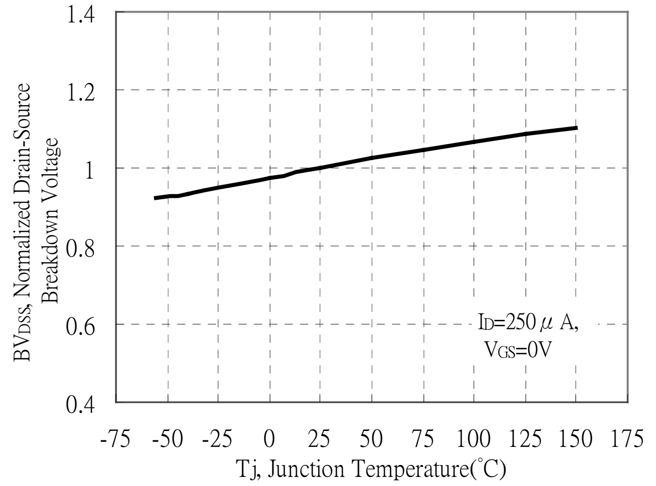
Recommended Soldering Footprint

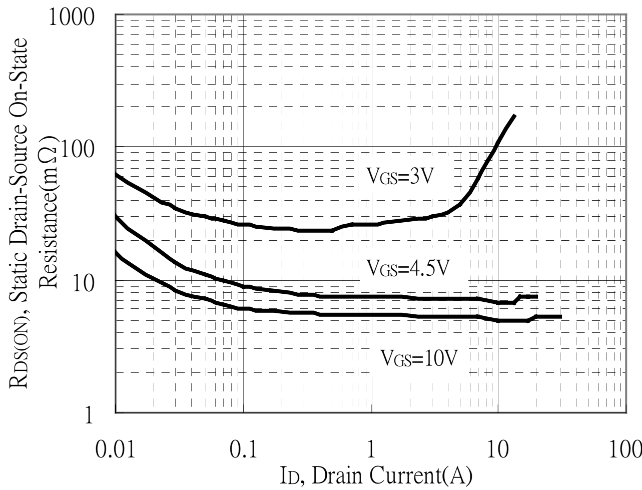


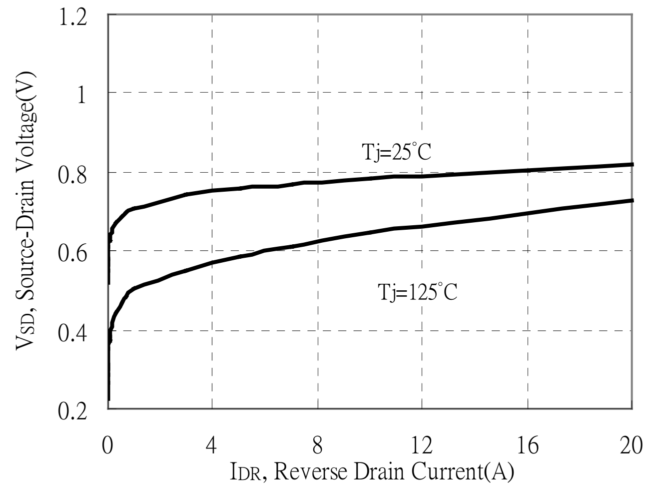
unit : mm

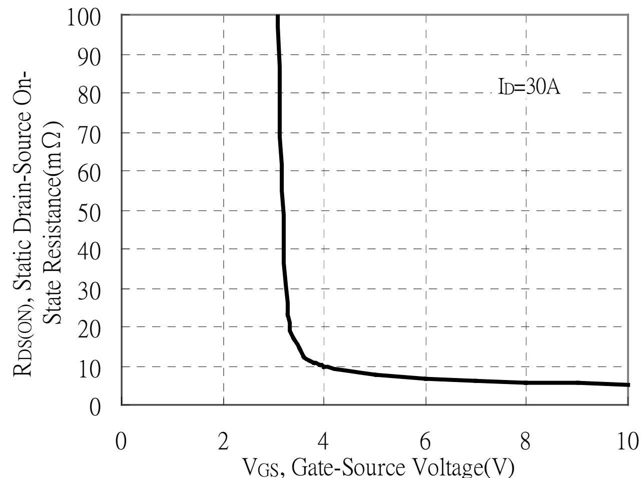
Typical Characteristics

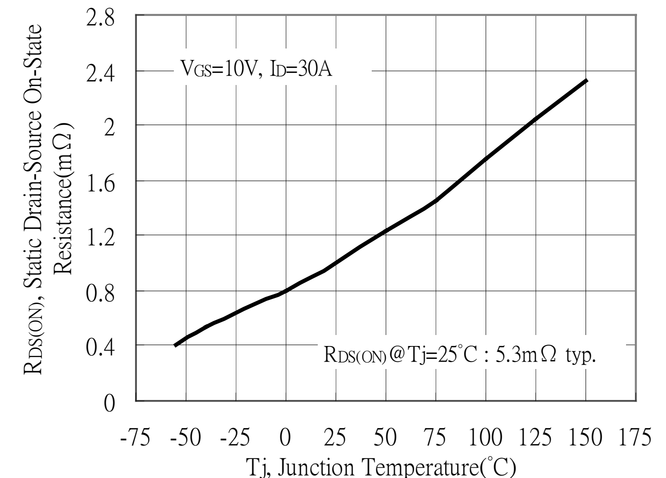




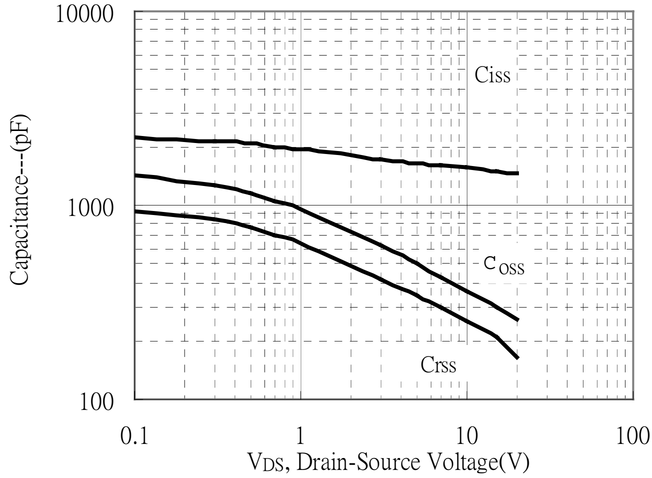


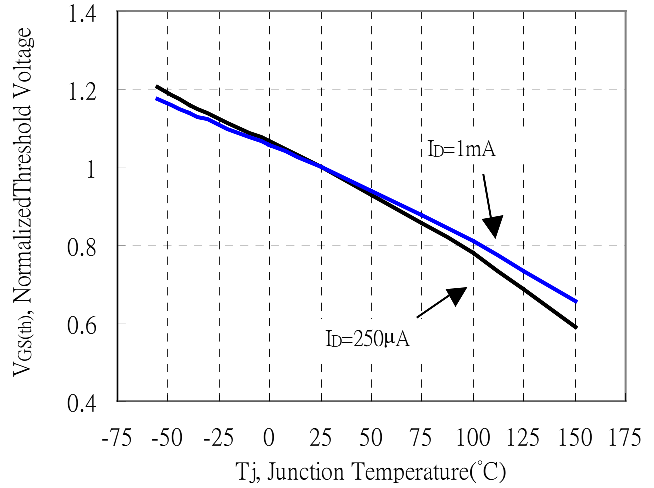


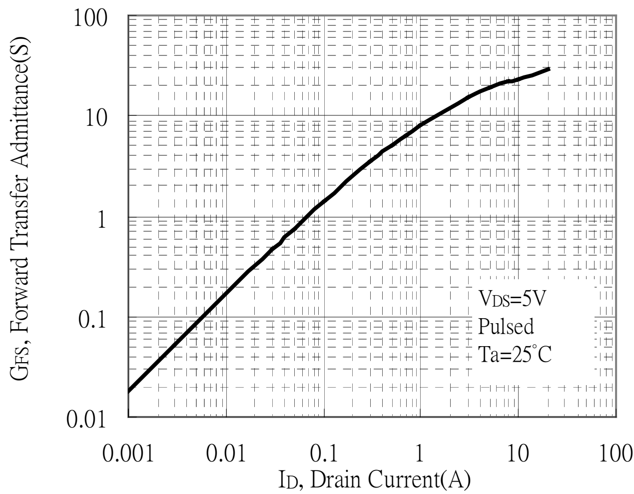


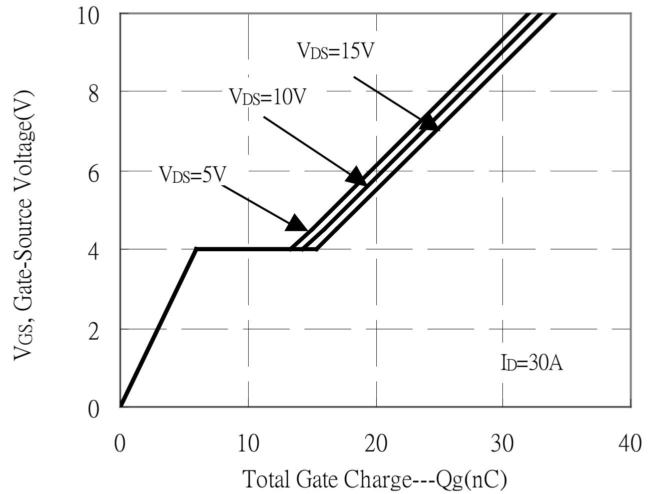


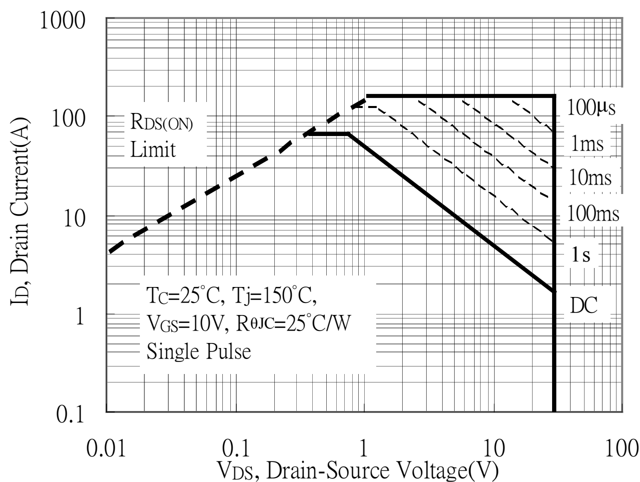
Typical Characteristics(Cont.)

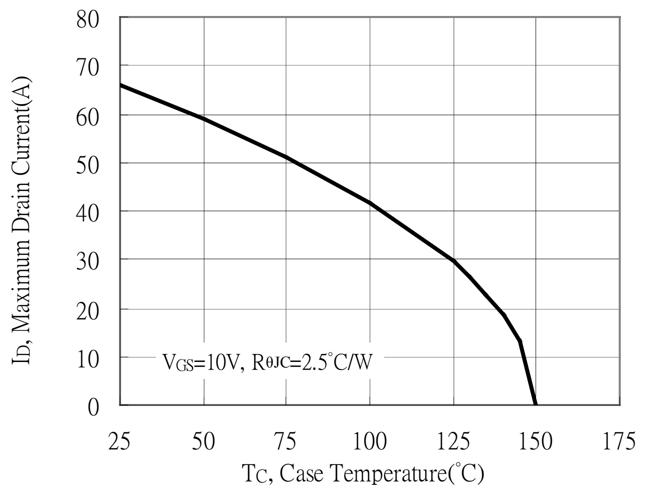












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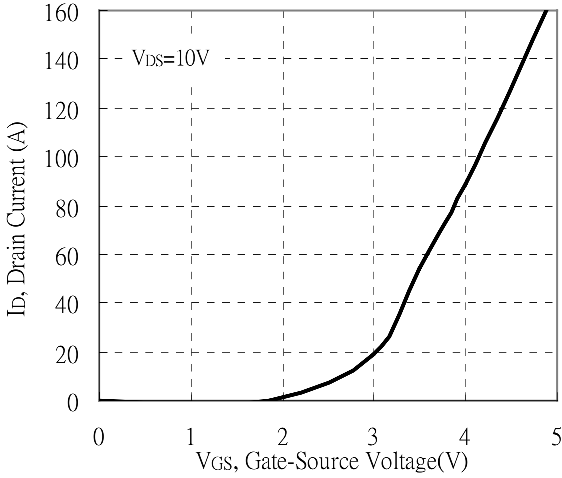
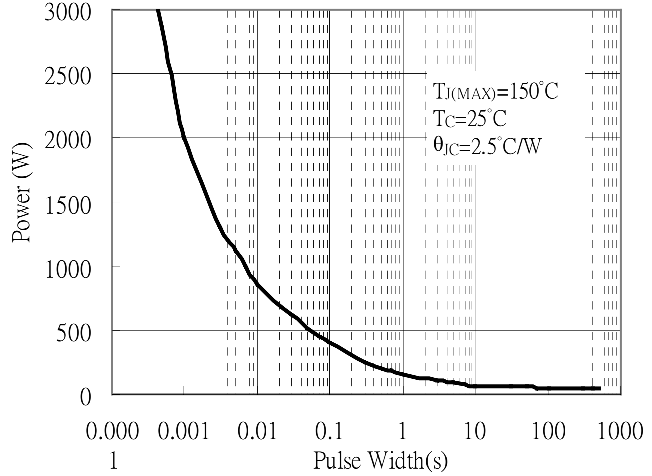
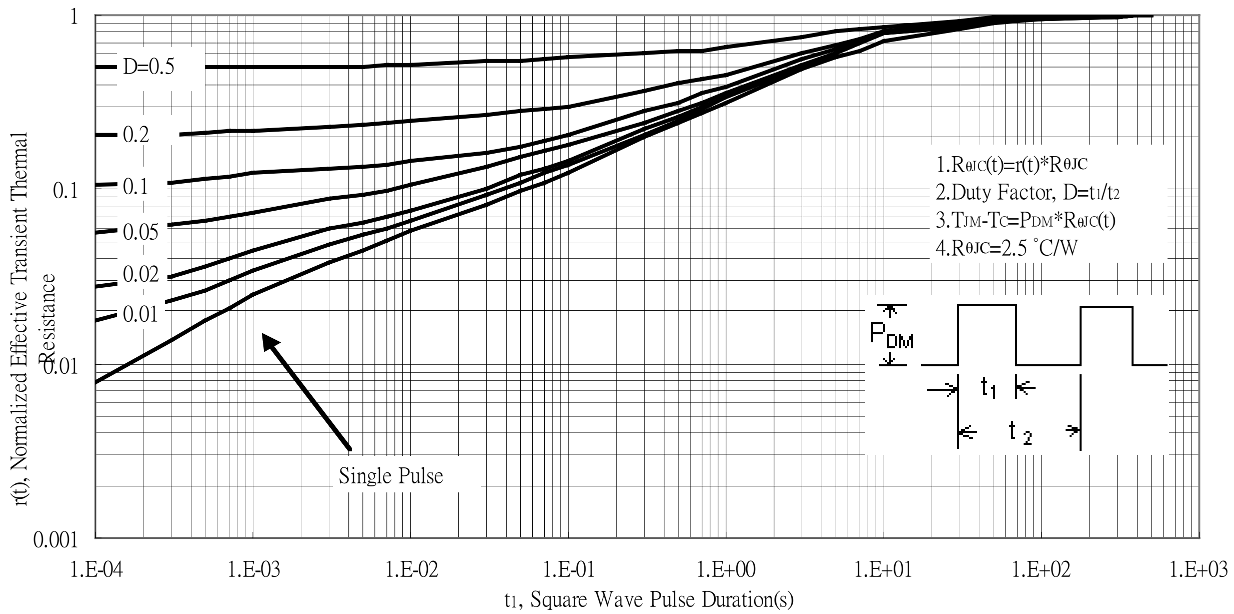
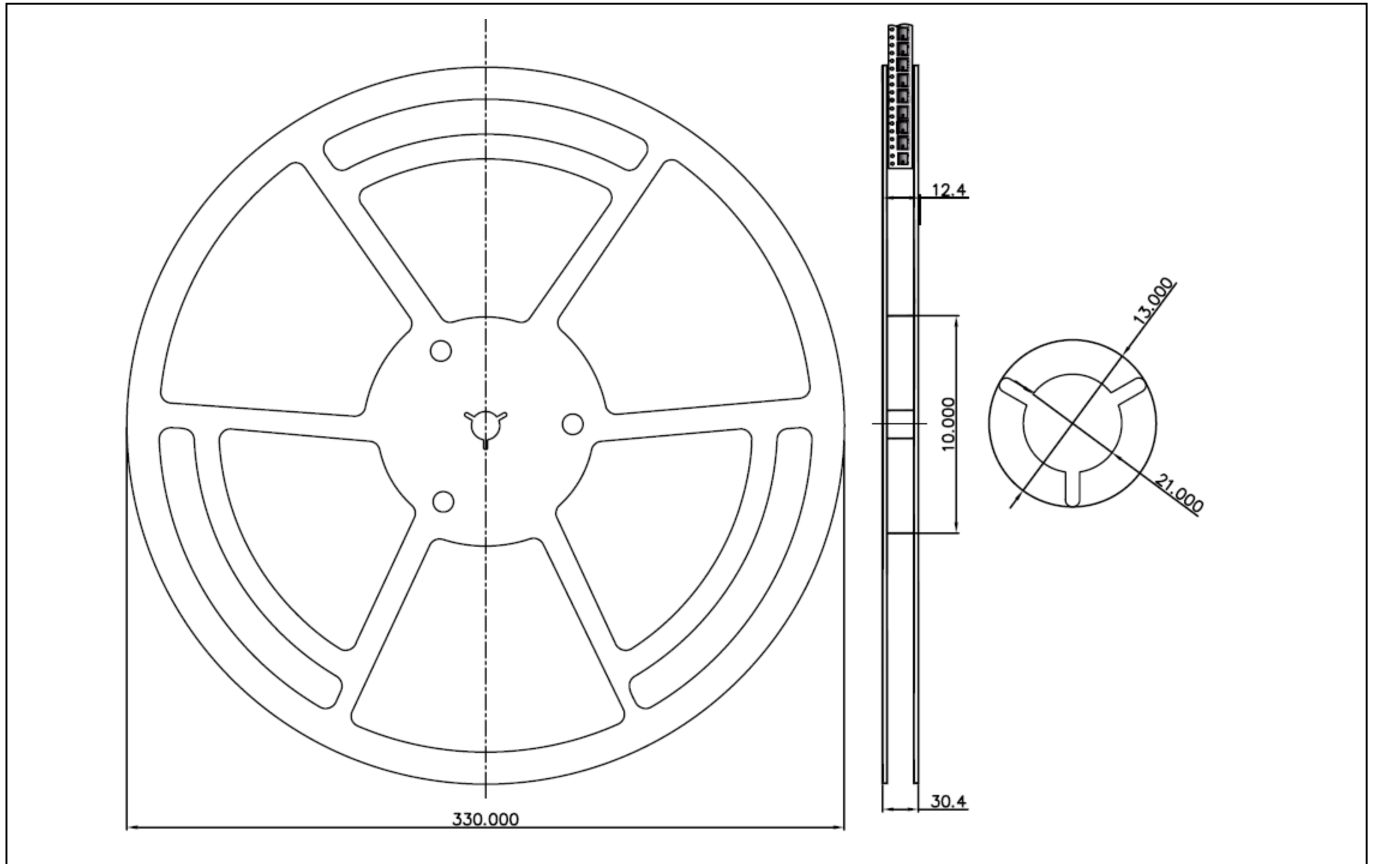


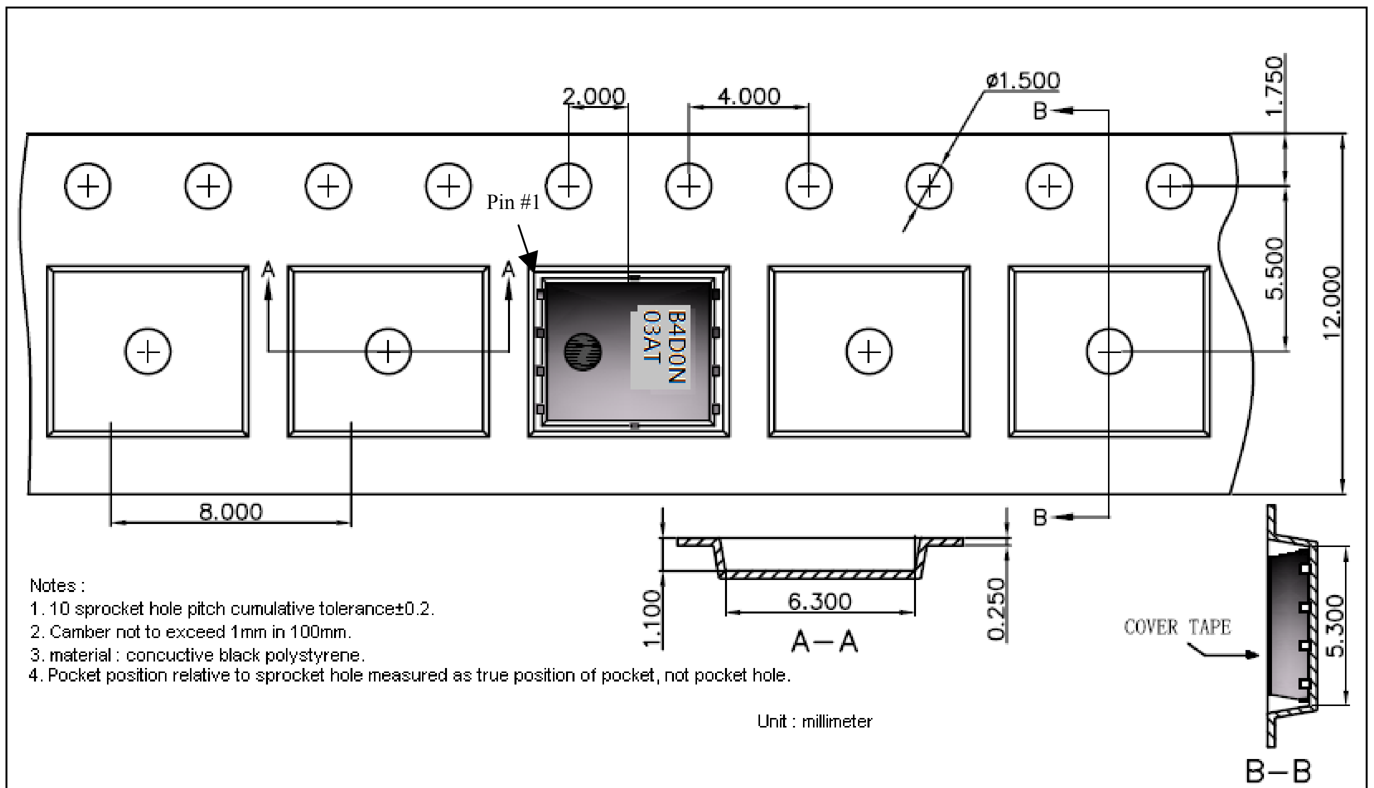




Reel Dimension



Carrier Tape Dimension



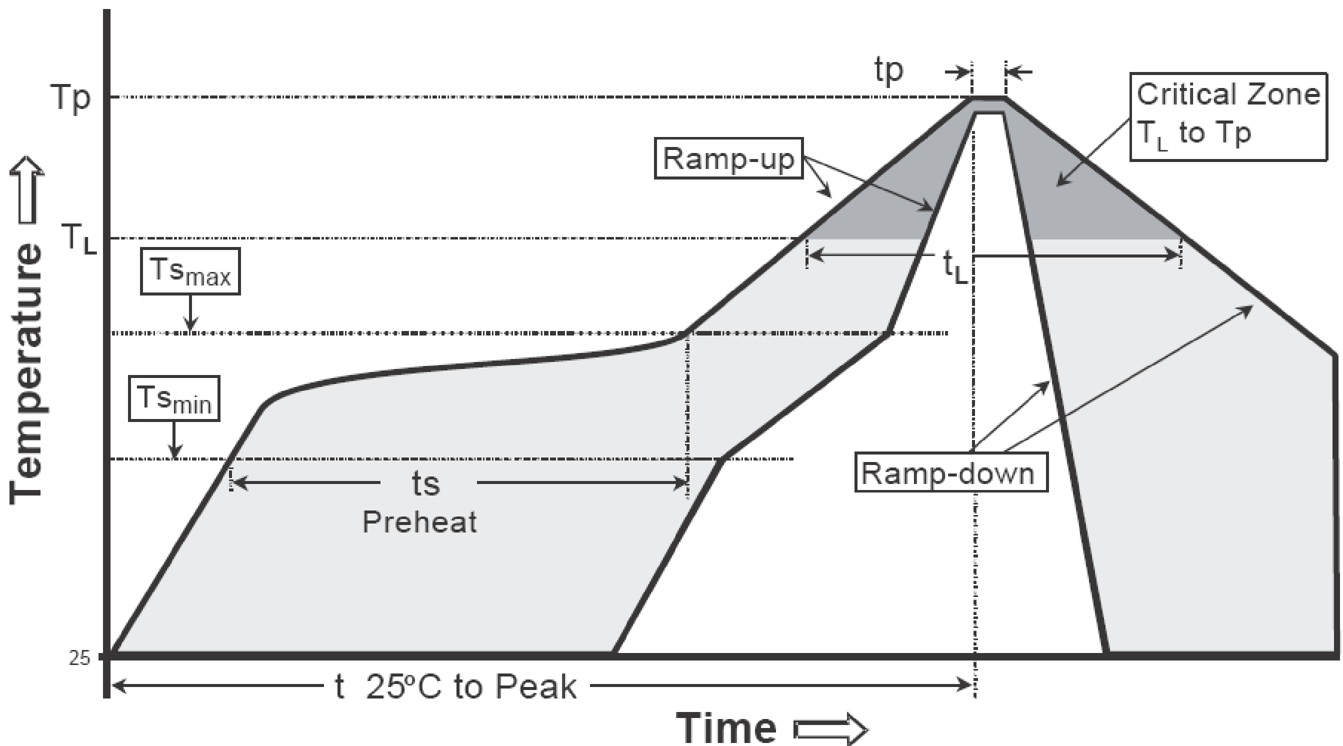
Notes :
1. 10 sprocket hole pitch cumulative tolerance±0.2.
2. Camber not to exceed 1mm in 100mm.
3. material : concuctive black polystyrene.
4. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

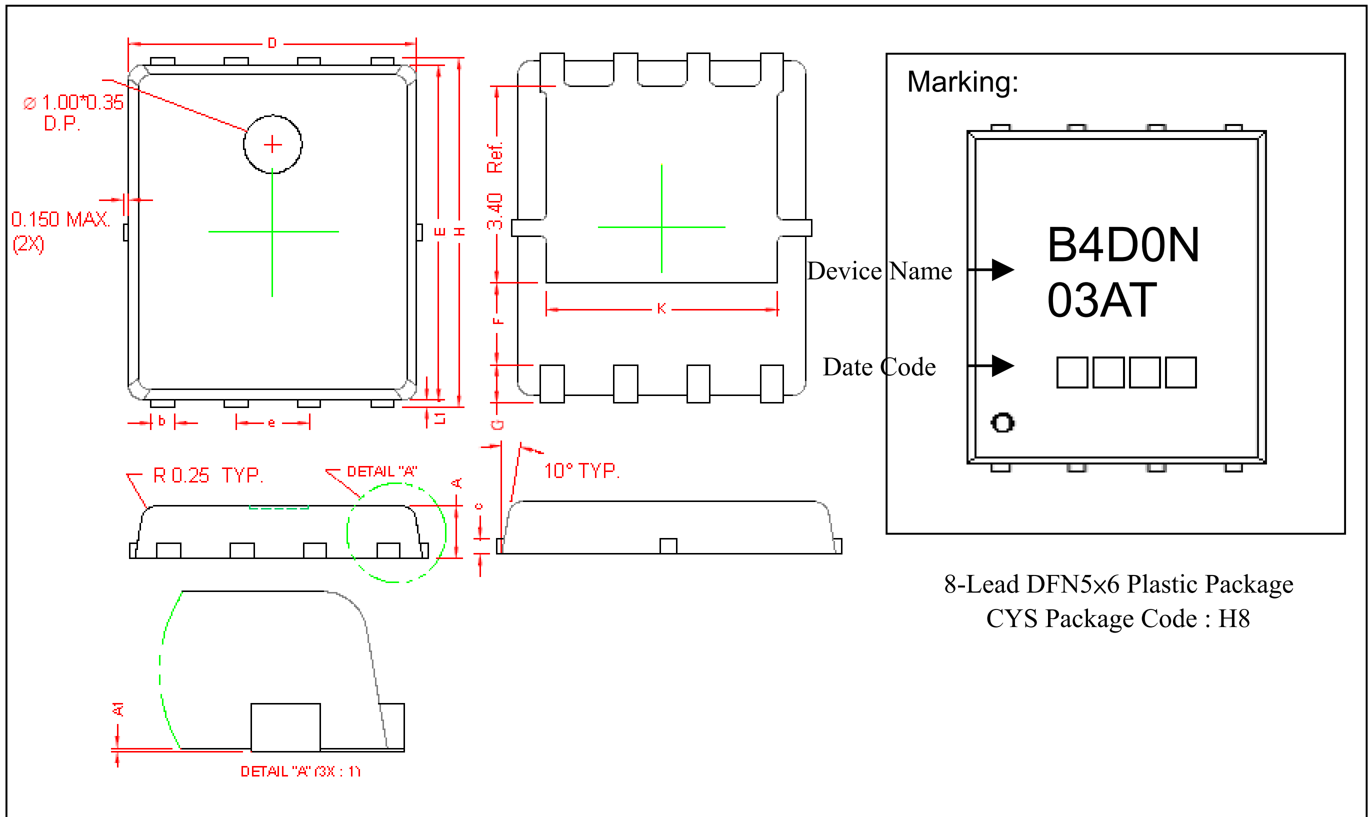
Recommended temperature profile for IR reflow



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(T_S min) −Temperature Max(T_S max) −Time(ts_{min} to ts_{max})	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	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



8-Lead DFN5x6 Plastic Package
CYS Package Code : H8

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.80	1.00	0.031	0.039	E	5.70	5.90	0.224	0.232
A1	0.00	0.05	0.000	0.002	e	1.27 BSC		0.050 BSC	
b	0.35	0.49	0.014	0.019	H	5.95	6.20	0.234	0.244
c	0.254 REF		0.010 REF		L1	0.10	0.18	0.004	0.007
D	4.90	5.10	0.193	0.201	G	0.60 REF		0.024 REF	
F	1.40 REF		0.055 REF		K	4.00 REF		0.157 REF	

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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