N-Channel Enhancement Mode Power MOSFET

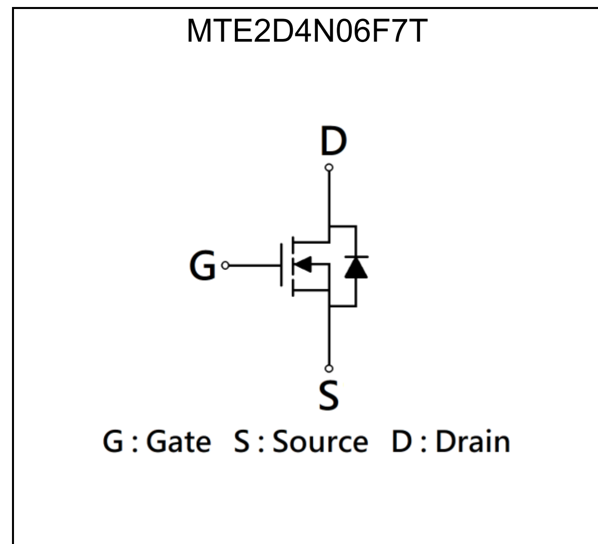
MTE2D4N06F7T

Features

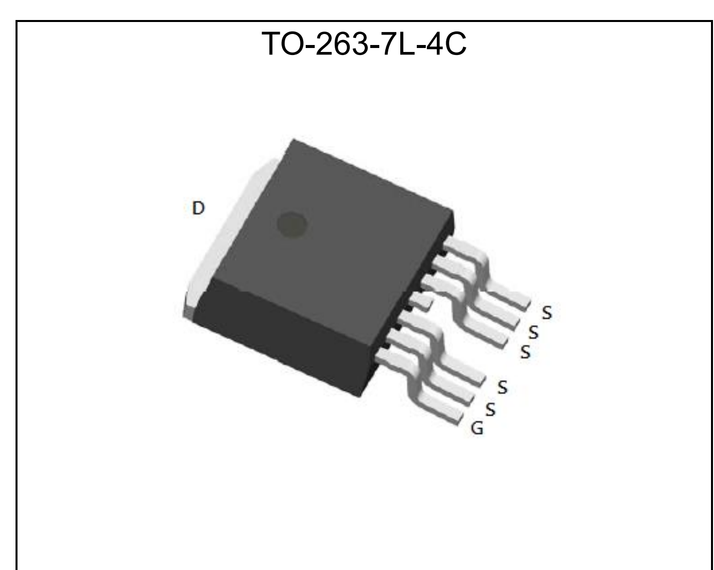
- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic

BV_{DSS}	60V
I_D@V_{GS}=10V, T_C=25˚C	150A
I_D@V_{GS}=10V, T_A=25˚C	27A
$R_{DS(ON)}$ typ. @V_{GS}=10V, I_D=20A	2mΩ

Equivalent Circuit



Outline



Ordering Information

Device	Package	Shipping
MTE2D4N06F7T-0-T7-G	TO-263-7L-4C (Pb-free lead plating and RoHS compliant package)	800 pcs / Tape & Reel

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

Packing spec, T7 : 800 pcs / tape & reel, 13” reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	150	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		95	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		27	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		22	
Pulsed Drain Current	*c	I_{DM}	600	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	115	
Pulsed Body Diode Forward Current @ T_C=25°C	*a	I_{SM}	460	
Avalanche Current @ L=0.1mH		I_{AS}	80	
Avalanche Energy @ L=0.5mH		E_{AS}	305	mJ
Total Power Dissipation	T_C=25°C *a	P_D	139	W
	T_C=100°C *a		56	
	T_A=25°C *b		4.6	
	T_A=70°C *b		2.9	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C

Thermal Data

Parameter		Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case		$R_{\theta JC}$	0.9	°C/W
Thermal Resistance, Junction-to-ambient	*b	$R_{\theta JA}$	27	

Note:

*a. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

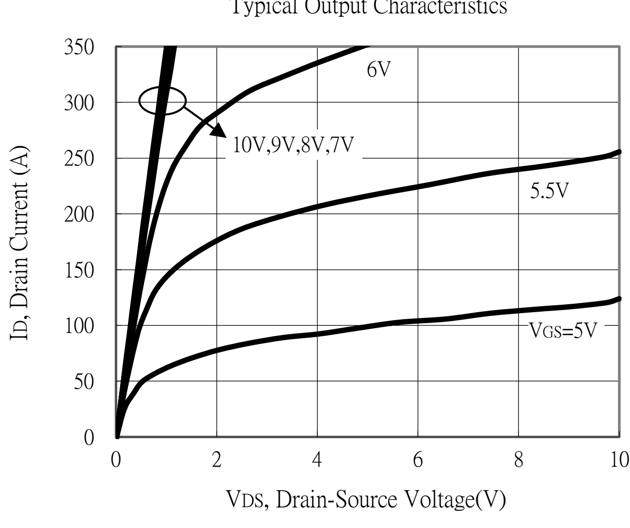
*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

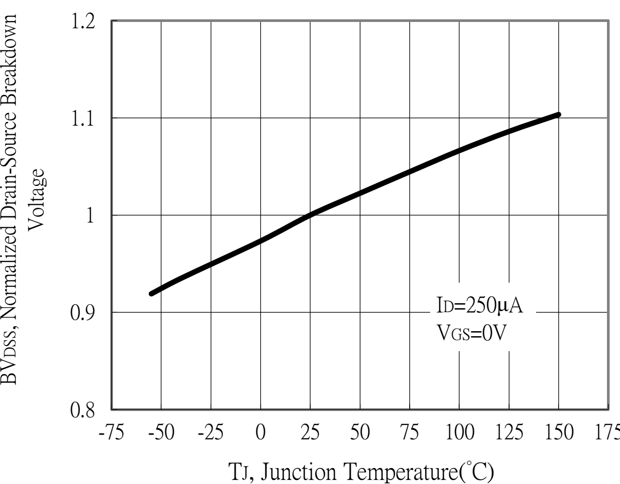
Electrical Characteristics (T_A=25°C, unless otherwise specified)

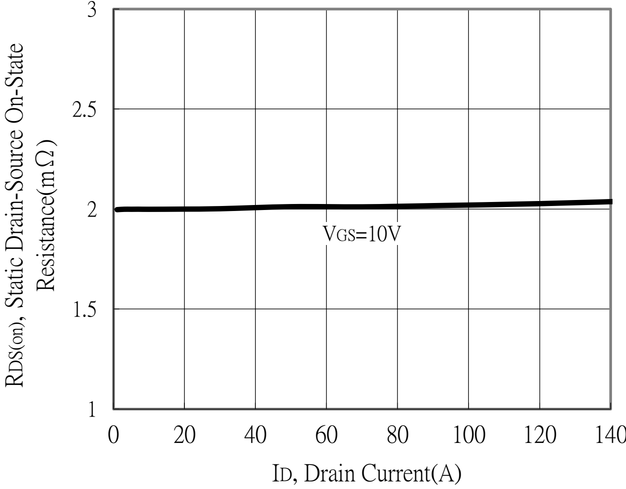
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2	-	4	V	V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	42	-	S	V_{DS}=10V, I_D=20A
I_{GSS}	-	-	±100	nA	V_{GS}=±30V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=48V, V_{GS}=0V
$R_{DS(ON)}$	-	2	2.6	mΩ	V_{GS}=10V, I_D=20A
Dynamic					
Ciss	-	6200	-	pF	V_{DS}=30V, V_{GS}=0V, f=1MHz
Coss	-	980	-	pF	V_{DS}=30V, V_{GS}=0V, f=1MHz
Crss	-	350	-	pF	V_{DS}=30V, V_{GS}=0V, f=1MHz
Rg	-	1.3	-	Ω	f=1MHz
Qg *1, 2	-	120	-	nC	V_{DS}=30V, I_D=20A, V_{GS}=10V
Qgs *1, 2	-	25	-	nC	V_{DS}=30V, I_D=20A, V_{GS}=10V
Qgd *1, 2	-	40	-	nC	V_{DS}=30V, I_D=20A, V_{GS}=10V
$t_{d(ON)}$ *1, 2	-	43	-	ns	V_{DS}=30V, I_D=20A, V_{GS}=10V, R_{GS}=4.7Ω
tr *1, 2	-	39	-	ns	V_{DS}=30V, I_D=20A, V_{GS}=10V, R_{GS}=4.7Ω
$t_{d(OFF)}$ *1, 2	-	95	-	ns	V_{DS}=30V, I_D=20A, V_{GS}=10V, R_{GS}=4.7Ω
t_f *1, 2	-	33	-	ns	V_{DS}=30V, I_D=20A, V_{GS}=10V, R_{GS}=4.7Ω
Source-Drain Diode					
V_{SD} *1	-	0.77	1.2	V	I_S=20A, V_{GS}=0V
trr	-	49	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	71	-	nC	I_F=20A, dI_F/dt=100A/μs

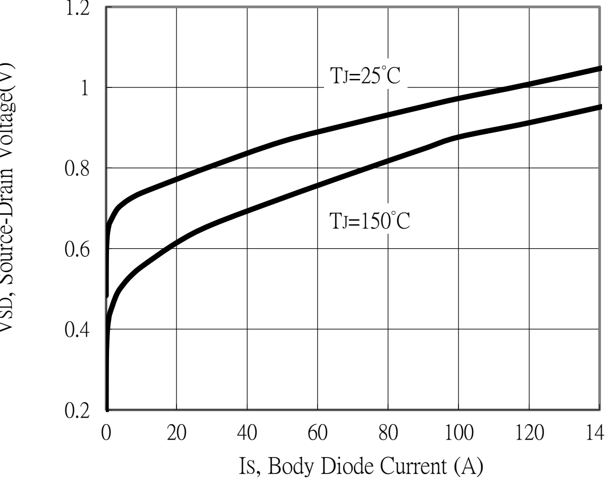
Note:
*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2. Independent of operating temperature

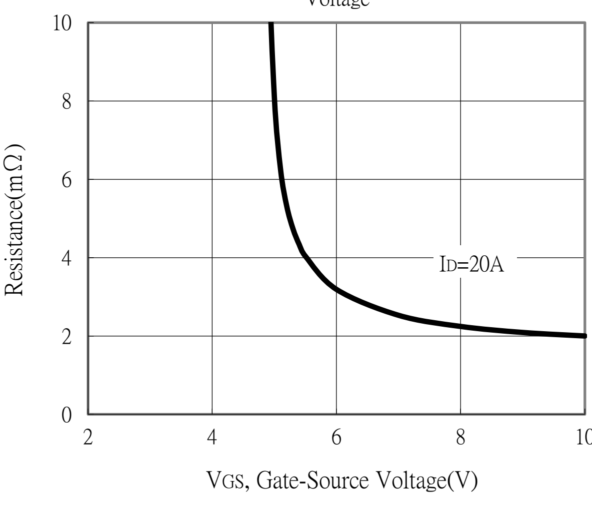
Typical Characteristics

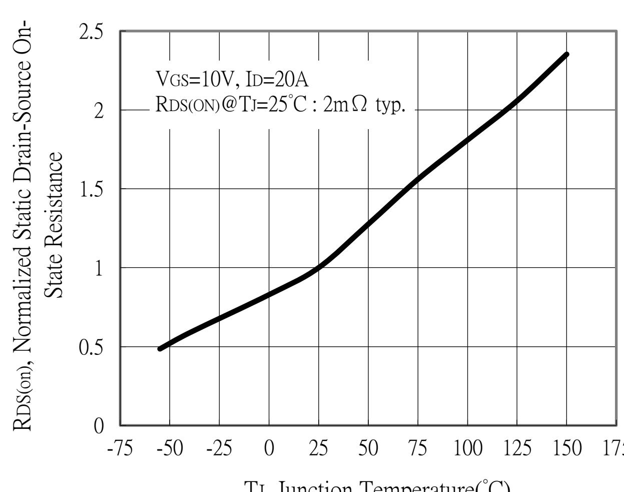












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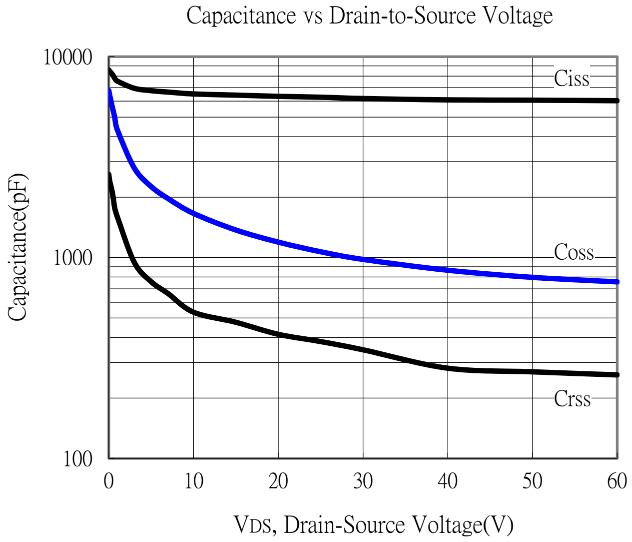

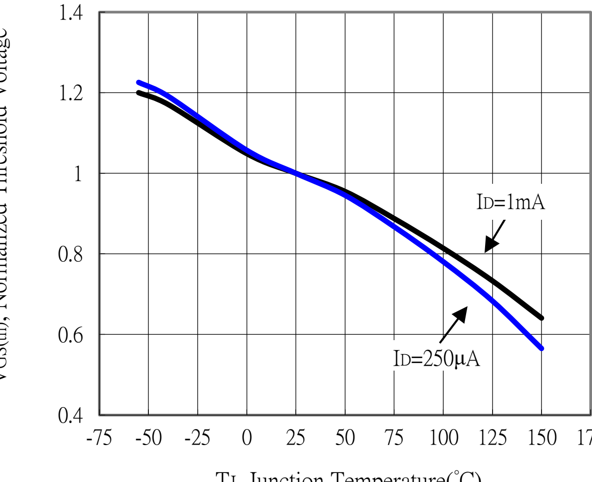

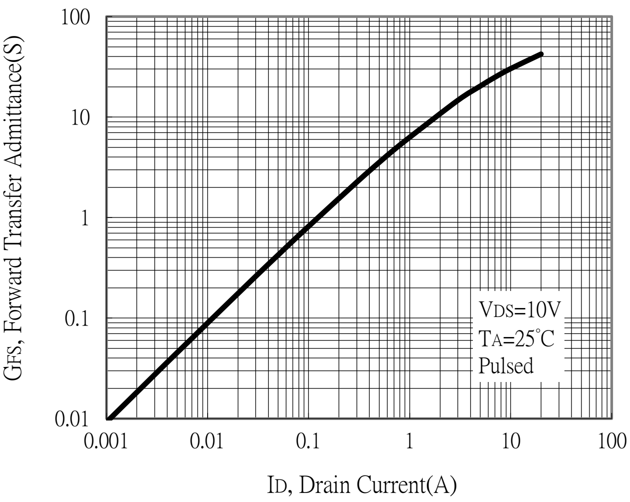

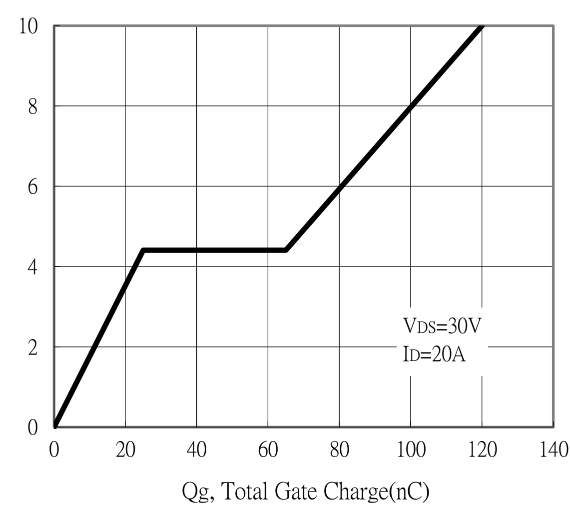

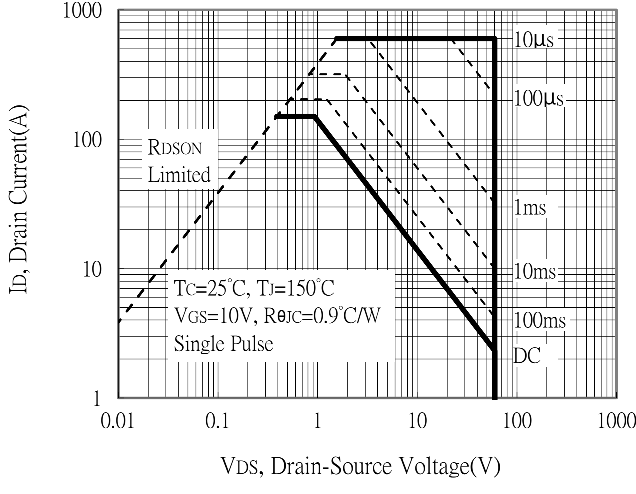

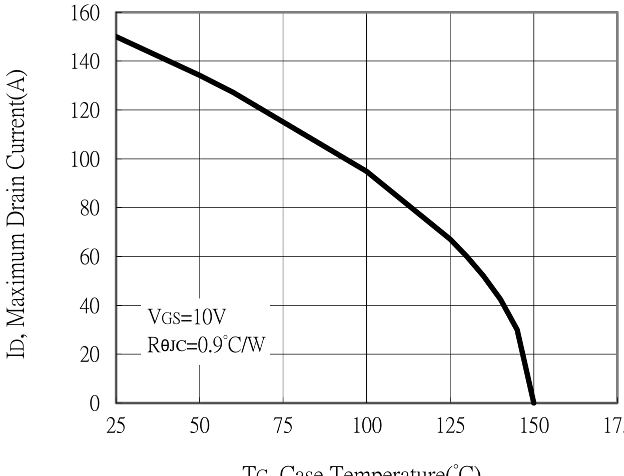

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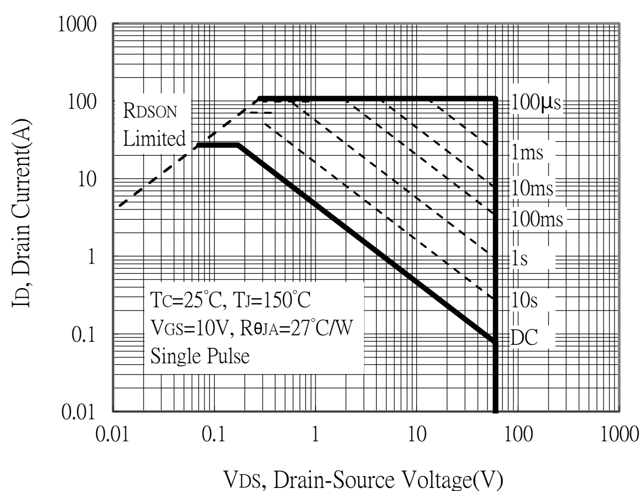

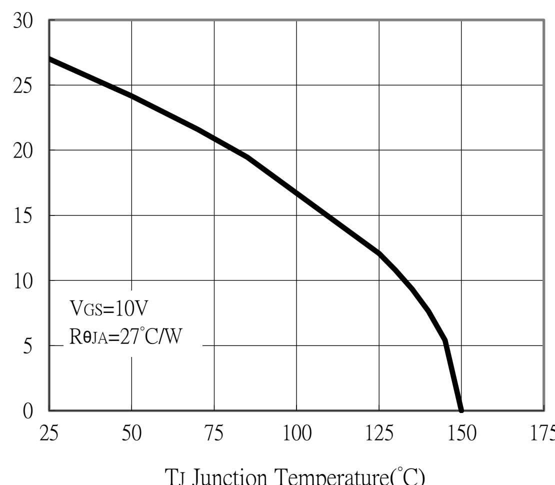

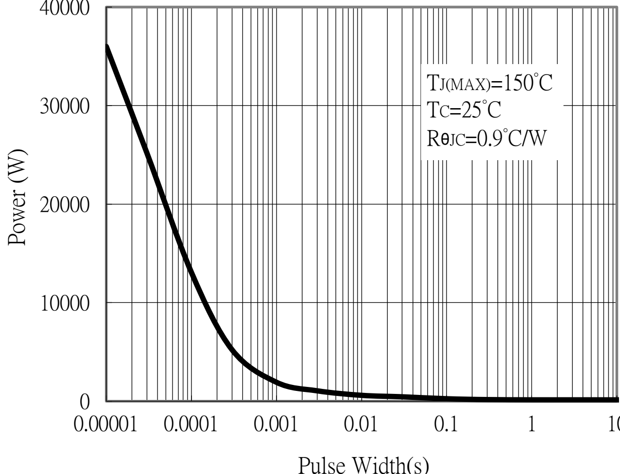

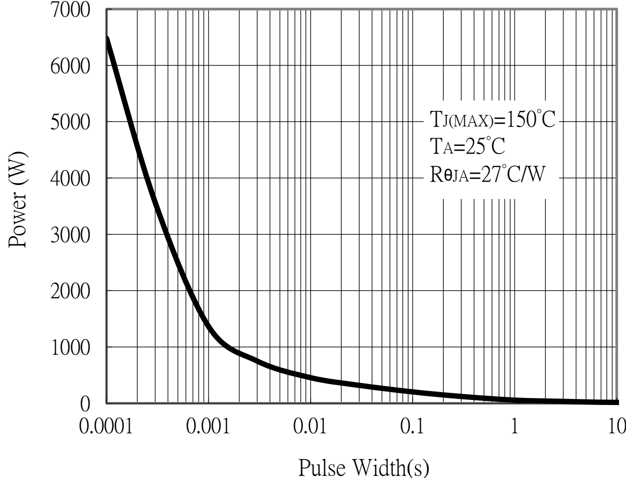

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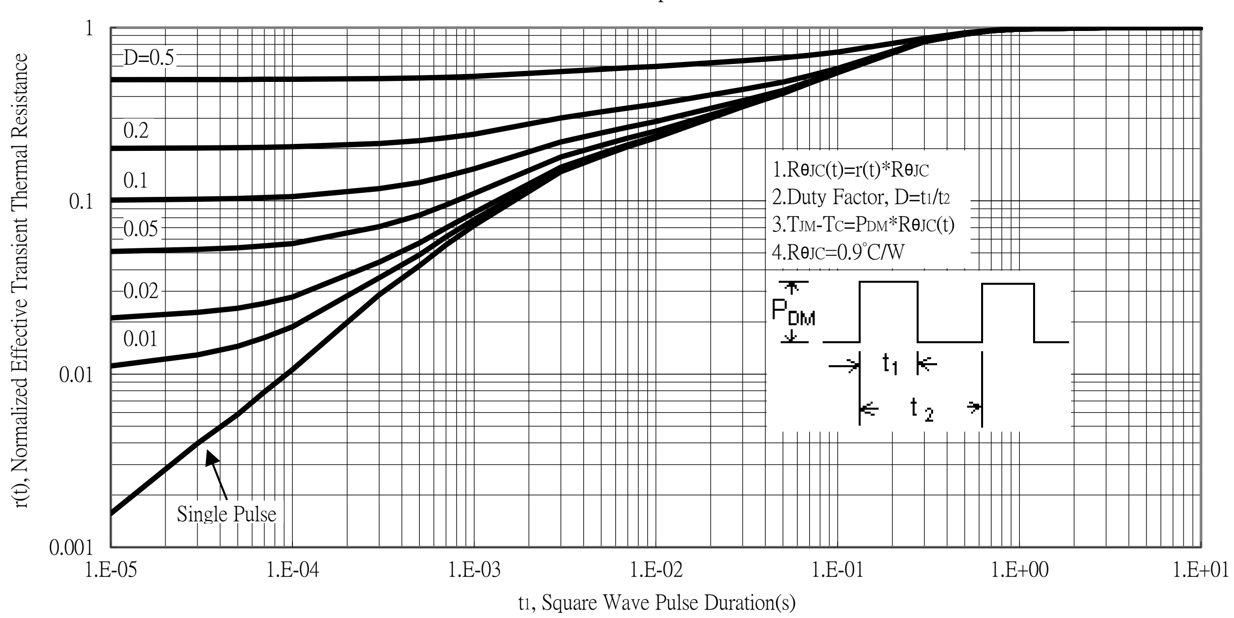
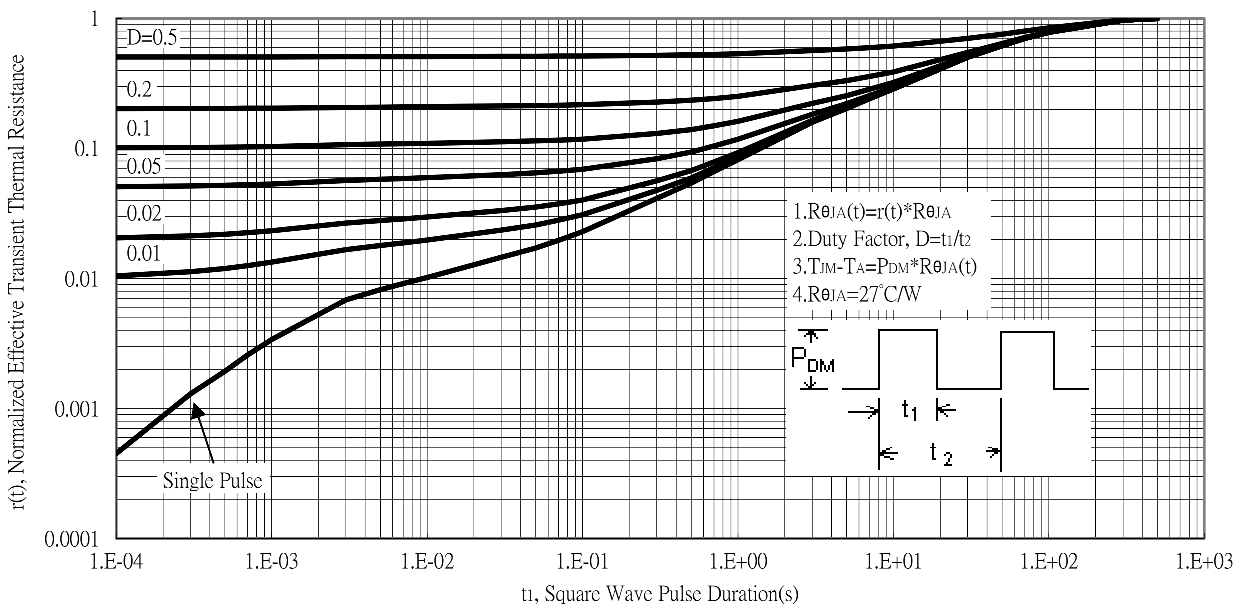
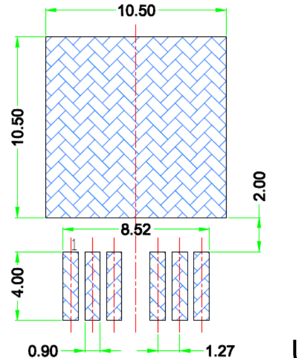


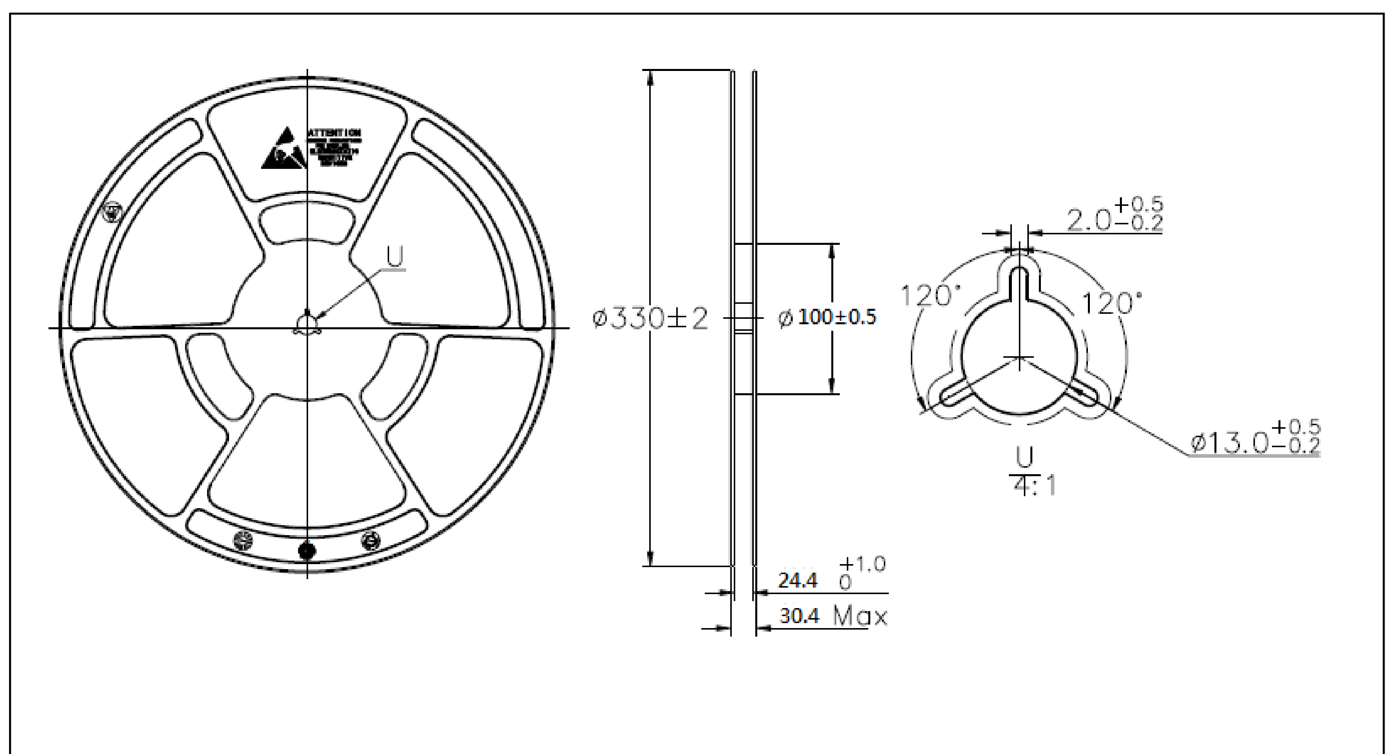


Recommended Soldering Footprint

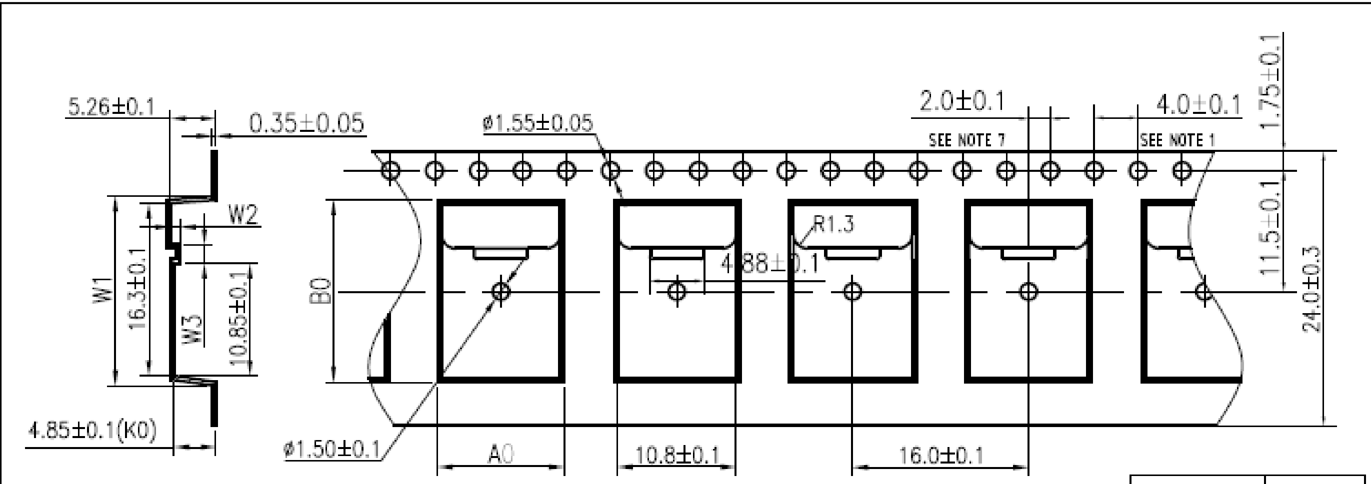


Unit : mm

Reel Dimension



Carrier Tape Dimension



NOTES

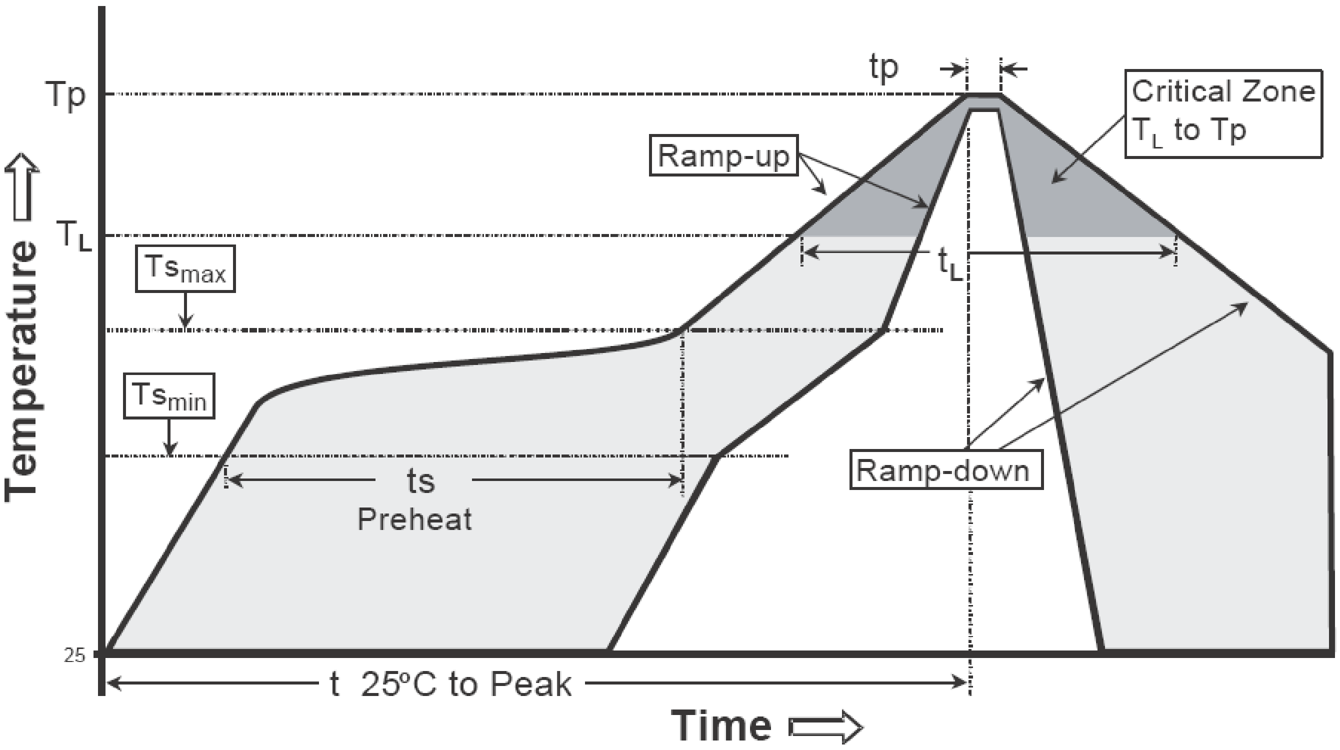
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLEANCE±0.2mm;
2. MATERIAL: BLACK CONDUCTIVE POLYSTYRENE;
3. DEMENSIONS ARE IN mm (UNLESS OTHERWISE SPECIFIEED);
4. K0 MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE ON THE CARRIER;
5. A0 AND B0 MEASURED ON A PLANE 0.30mm ABOVE THE BOTTOM OF THE POCKET;
6. SURFACE RESISTIVITY IS BETWEEN 1×10E6 TO 1×10E10 OHMS/SQUARE;
7. Allowable Camber to be 1 mm/100 mm

Dim		Spec
opt 1	W1	16.9±0.1
	W2	1.3±0.1
	W3	1.0±0.1
opt 2	W1	17.2±0.1
	W2	1.8±0.1
	W3	0.85±0.1

Recommended wave soldering condition

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

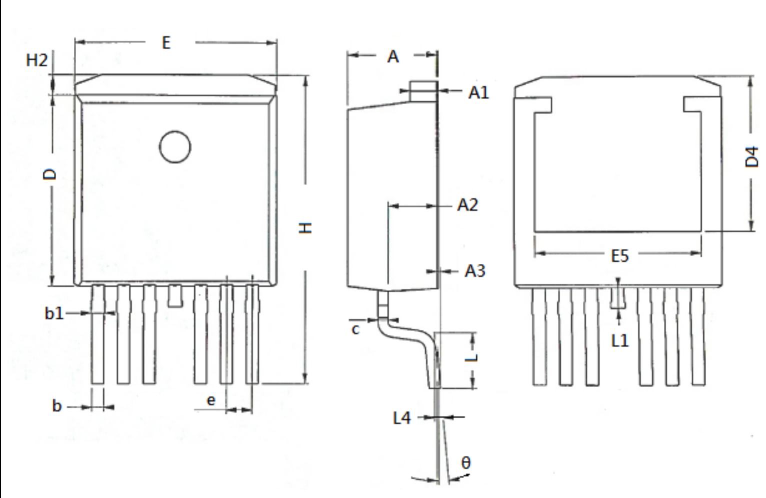
Recommended temperature profile for IR reflow



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) −Temperature Max(Ts 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.

TO-263-7L-4C Dimension (Site1 forming)



7-Lead Plastic Surface Mounted TO-263-7L Package
CYS Package Code : F7T

Marking :

4
CYS
E2D4N06
Device Name
Date Code
□□□□ H
Assembly site code:
H→site 1
A→site 2
1 2 3 4 5 6 7

Style : Pin 1. Gate
Pin 2, 3, 5, 6, 7 : Source
Pin 4. Drain

Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd 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
3rd and 4th codes : production serial number, 01~99

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.167	0.179	4.25	4.55	E	0.386	0.402	9.80	10.20
A1	0.047	0.055	1.20	1.40	e	0.050	BSC	1.27	BSC
A2	0.089	0.100	2.25	2.55	E5	0.285	-	7.25	-
A3	0.0004	0.010	0.01	0.25	H	0.577	0.604	14.65	15.35
b	0.020	0.028	0.50	0.70	H2	0.031	0.047	0.80	1.20
b1	0.023	0.033	0.58	0.84	L	0.094	0.118	2.40	3.00
c	0.016	0.024	0.40	0.60	L1	0.033	0.045	0.85	1.15
D	0.356	0.372	9.05	9.45	L4	0.010	BSC	0.25	BSC
D4	0.272	-	6.90	-	θ	2°	8°	2°	8°

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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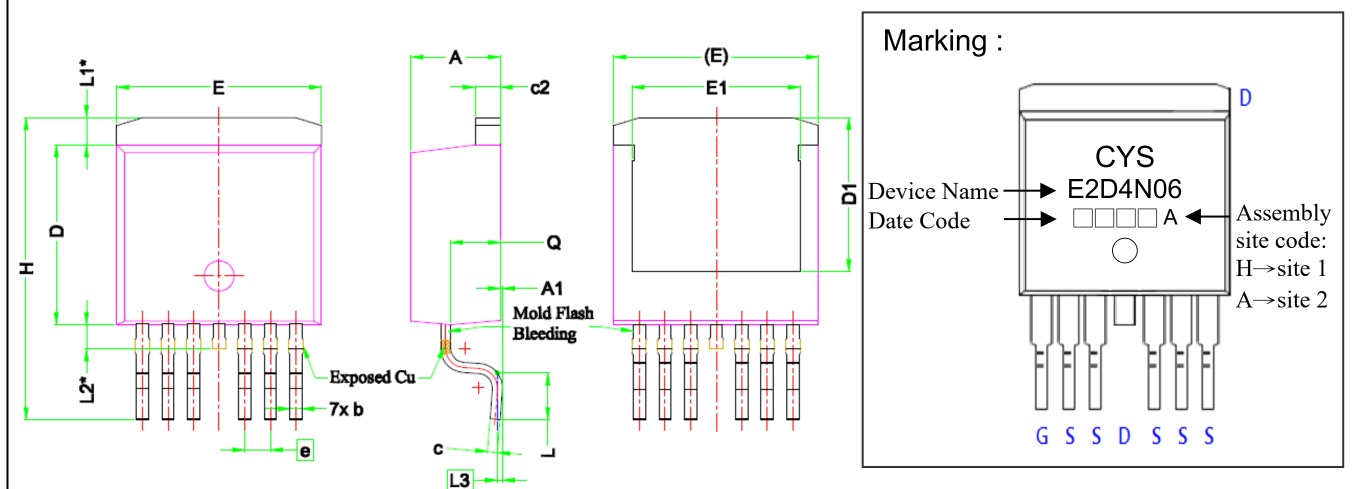
TO-263-7L-4C Dimension (Site2 forming)



Style : Pin 1. Gate
Pin 2, 3, 5, 6, 7 : Source
Pin 4. Drain

Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd 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
3rd and 4th codes : production serial number, 01~99

7-Lead Plastic Surface Mounted TO-263-7L Package
CYS Package Code : F7T

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.167	0.183	4.24	4.64	E1	0.321	0.337	8.15	8.55
A1	0.000	0.010	0.00	0.25	e	0.050 BSC		1.27 BSC	
b	0.020	0.028	0.50	0.70	H	0.575	0.625	14.61	15.88
c	0.016	0.024	0.40	0.60	L	0.070	0.110	1.78	2.79
c2	0.045	0.055	1.15	1.40	L1	0.054 REF.		1.36 REF.	
D	0.347	0.355	8.82	9.02	L2	0.047 REF.		1.20 REF.	
D1	0.270	-	6.86	-	L3	0.010 BSC		0.25 BSC	
E	0.392	0.408	9.96	10.36	Q	0.091	0.106	2.30	2.70

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
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Material :

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