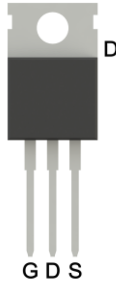
Product Summary

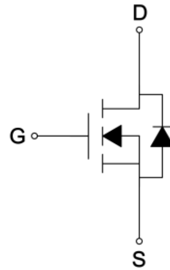
BV_{DSS}	100	V
$R_{DS(ON)}$ typ. @ V_{GS}=10V, I_D=20A	4.2	mΩ
I_D @ V_{GS}=10V, T_C=25°C	86	A
I_D @ V_{GS}=10V, T_A=25°C	21	

Features

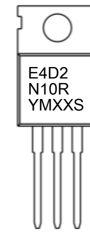
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

TO-220





Marking



← Device Code

← Date Code,

Assembly site code

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

S: Assembly site code, Site 1: A

Ordering Information

Device	Package	Shipping
MTE4D2N10RE3-0-UB-G	TO-220	50 pcs/tube, 20 tubes/box, 5 boxes / carton

0: Product rank, zero for no rank products.

UB: Packing spec, UB : 50 pcs / tube, 20 tubes/box

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

Absolute Maximum Ratings (T_A=25°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°C (silicon limit)		*a	I_D	114	A
Continuous Drain Current @ V_{GS}=10V, T_C=25°C (package limit)		*a		86	
Continuous Drain Current @ V_{GS}=10V, T_C=100°C		*a		72	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C		*b		21	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C		*b		17	
Pulsed Drain Current		*c	I_{DM}	344	
Continuous Body Diode Forward Current @ T_C=25°C		*a	I_S	86	
Pulsed Body Diode Forward Current @ T_C=25°C		*a	I_{SM}	344	
Avalanche Current @ L=0.1mH			I_{AS}	50	
Avalanche Energy @ L=0.5mH			E_{AS}	225	mJ
Total Power Dissipation	T_C=25°C	*a	P_D	156	W
	T_C=100°C	*a		62	
	T_A=25°C	*b		5.4	
	T_A=70°C	*b		3.5	
Operating Junction and Storage Temperature Range			T_J, T_{stg}	-55~+150	°C
Steady State Thermal Resistance, Junction-to-Case			$R_{\theta JC}$	0.8	°C/W
Steady State Thermal Resistance, Junction-to-Ambient		*b	$R_{\theta JA}$	23	

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2	-	4		V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	29	-	S	V_{DS}=10V, I_D=20A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=80V, V_{GS}=0V
$R_{DS(ON)}$	-	4.2	5.6	mΩ	V_{GS}=10V, I_D=20A
Dynamic					
C_{iss}	-	4200	-	pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
C_{oss}	-	580	-		
C_{rss}	-	36	-		
R_g	-	0.7	-	Ω	f=1MHz
Q_g *d,e	-	63	-	nC	V_{DS}=50V, I_D=20A, V_{GS}=10V
Q_{gs} *d,e	-	21	-		
Q_{gd} *d,e	-	14	-		
$t_{d(ON)}$ *d,e	-	35	-	ns	V_{DS}=50V, I_D=20A, V_{GS}=10V, R_{GS}=1Ω
tr *d,e	-	20	-		
$t_{d(OFF)}$ *d,e	-	57	-		
t_f *d,e	-	14	-		
Source-Drain Diode					
V_{SD} *d	-	0.82	1.2	V	I_S=20A, V_{GS}=0V
t_{rr}	-	50	-	ns	I_F=20A, di/dt=100A/μs
Q_{rr}	-	84	-	nC	

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.

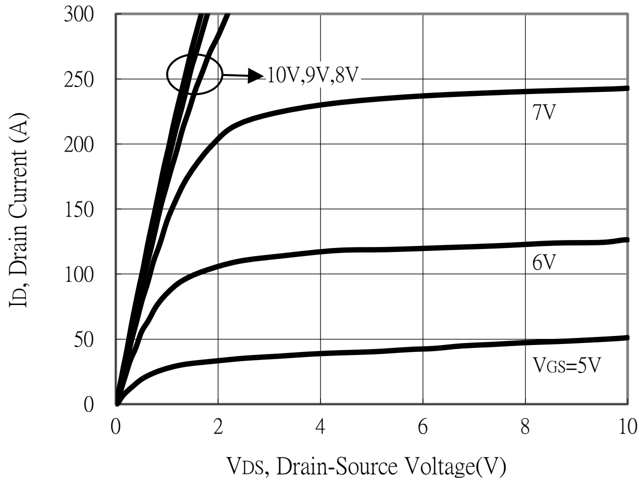
*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on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

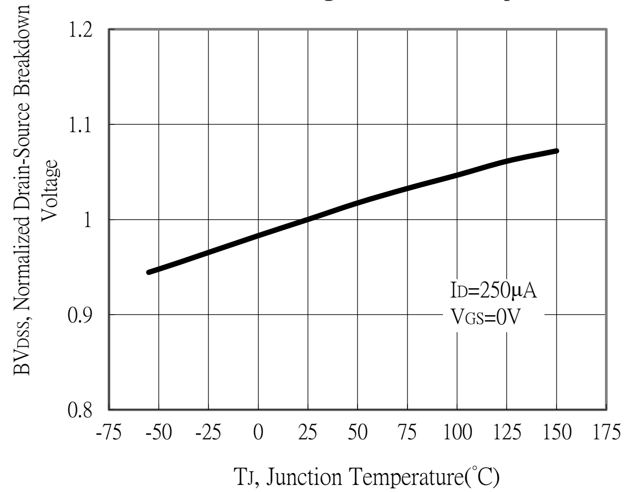
*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

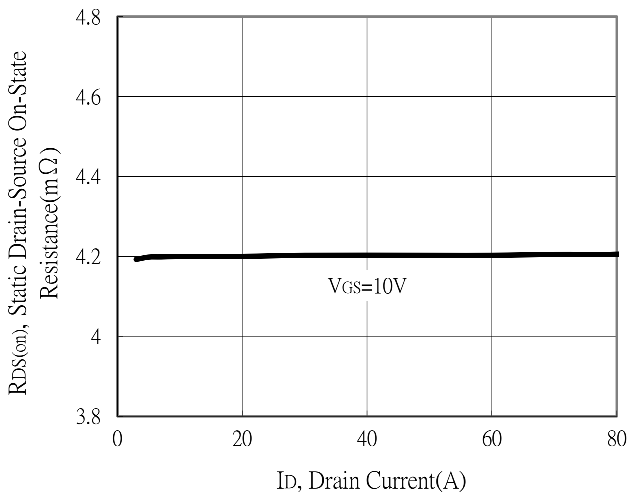
*d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.

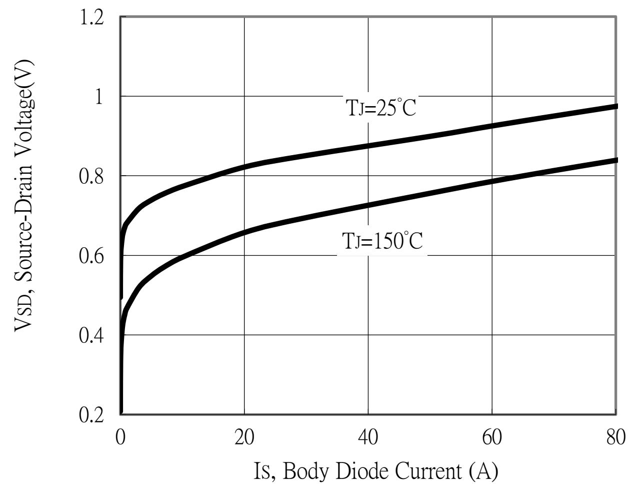
*e. Independent of operating temperature.

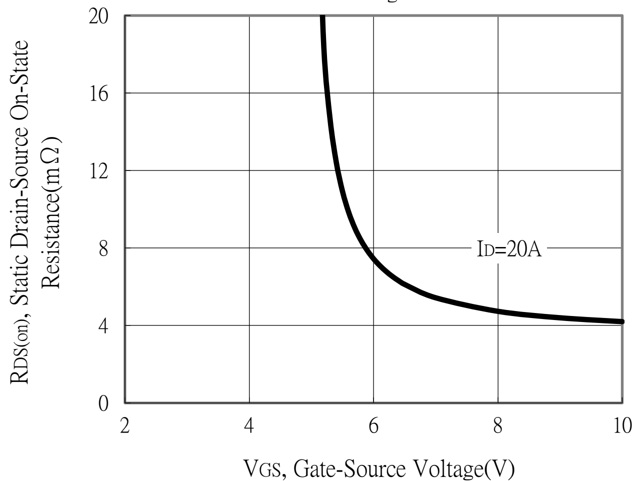
Typical Characteristics

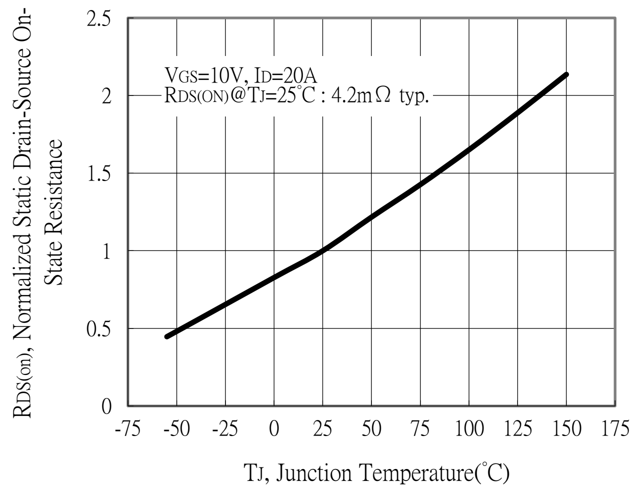












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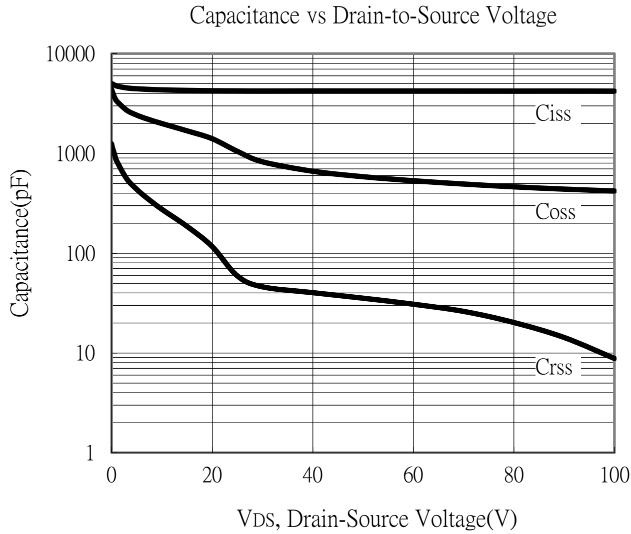

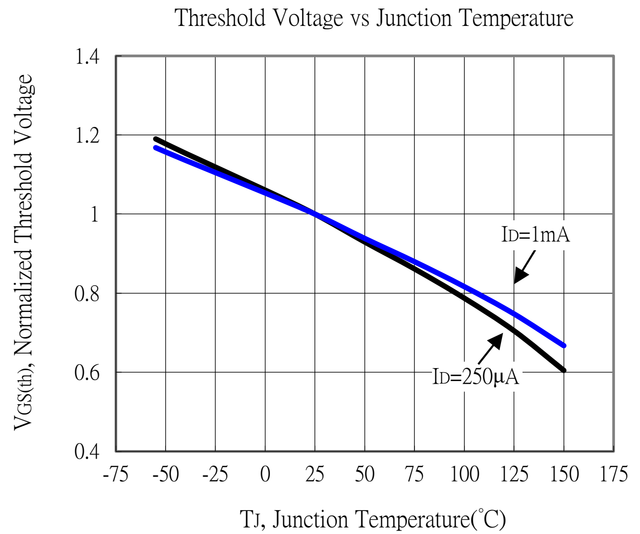

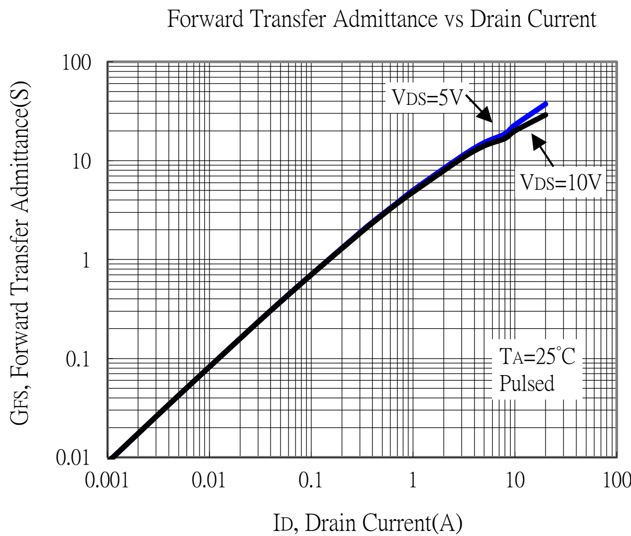

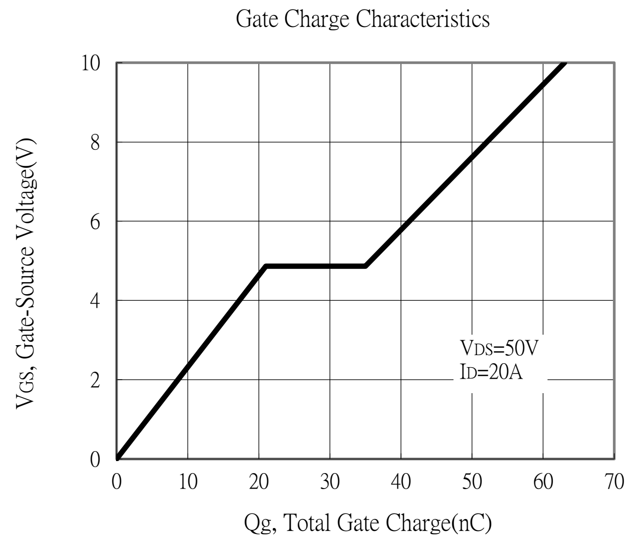

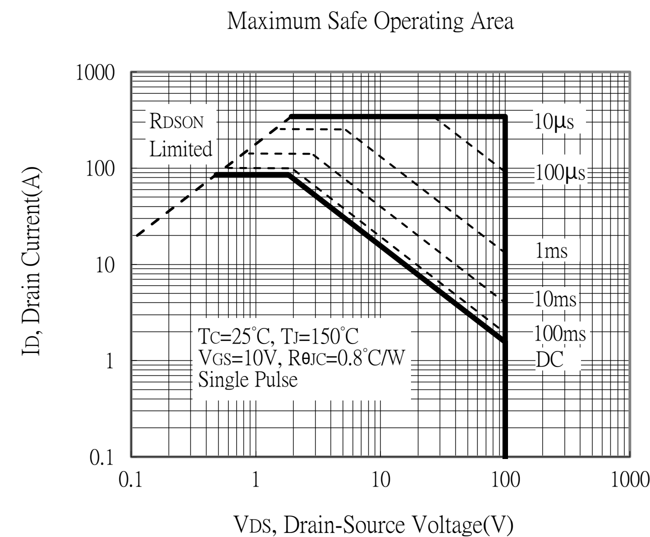

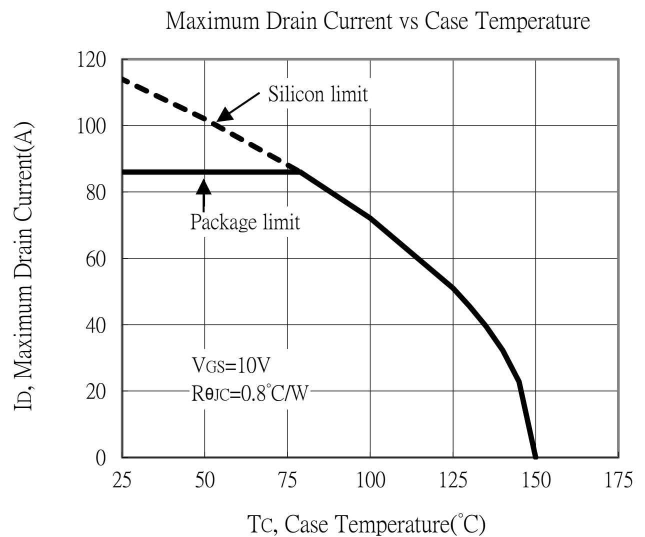

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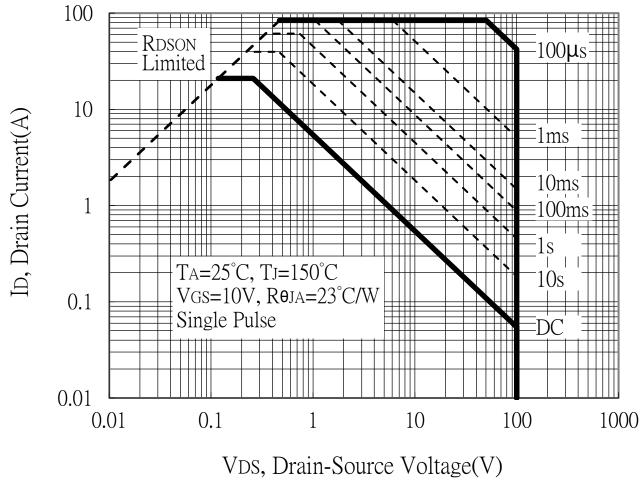

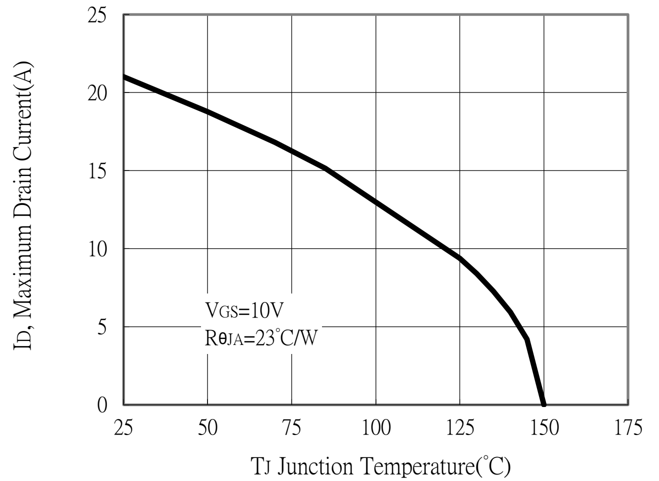

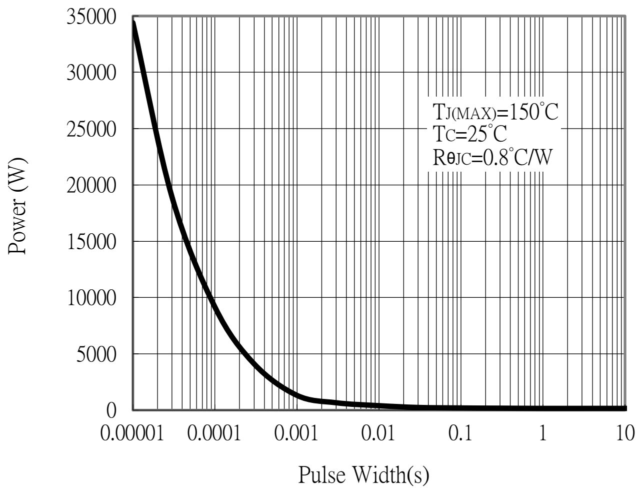

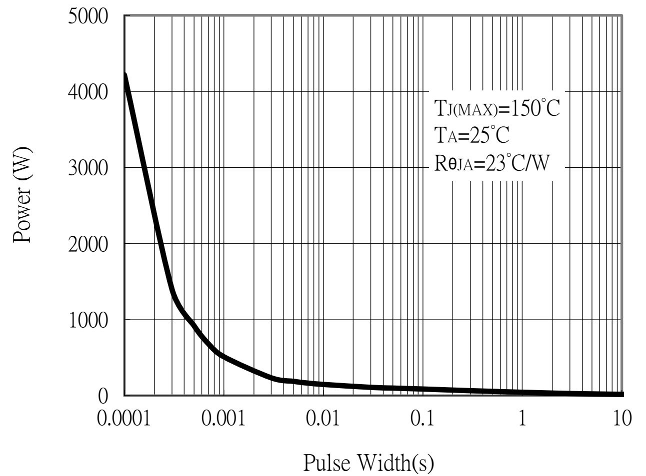

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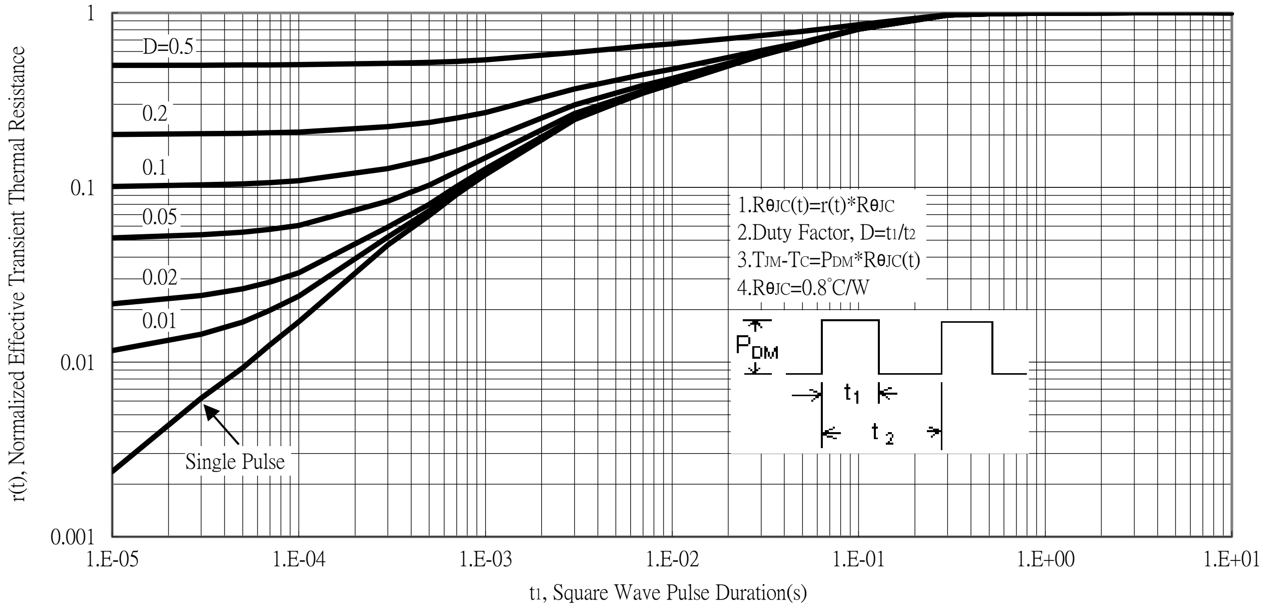
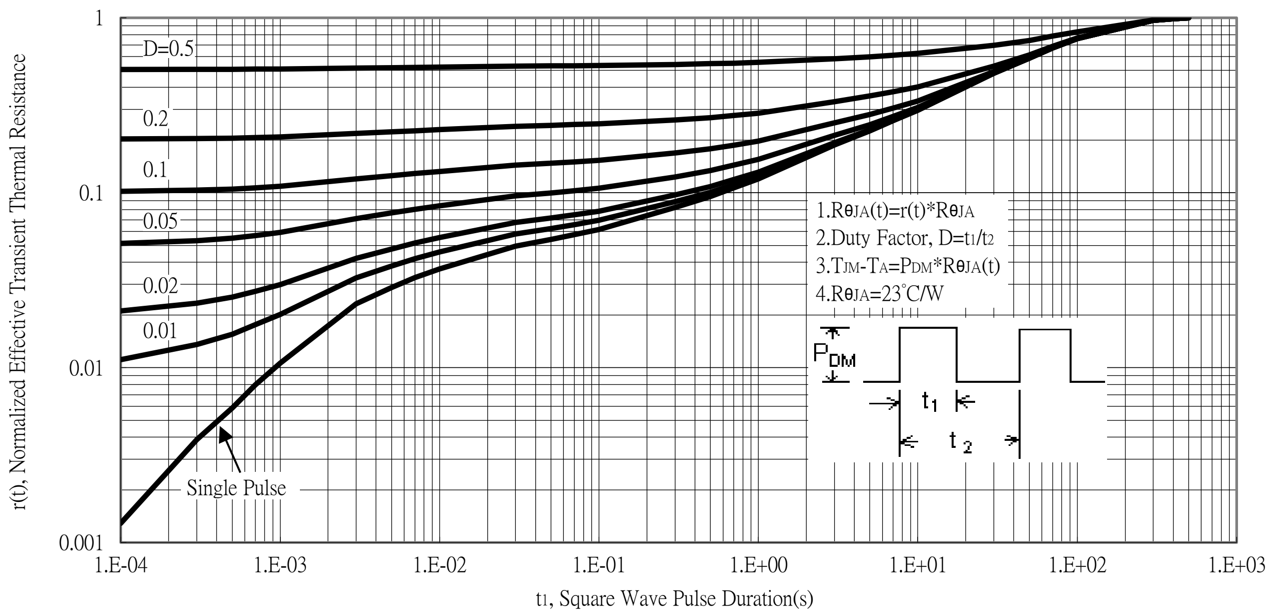
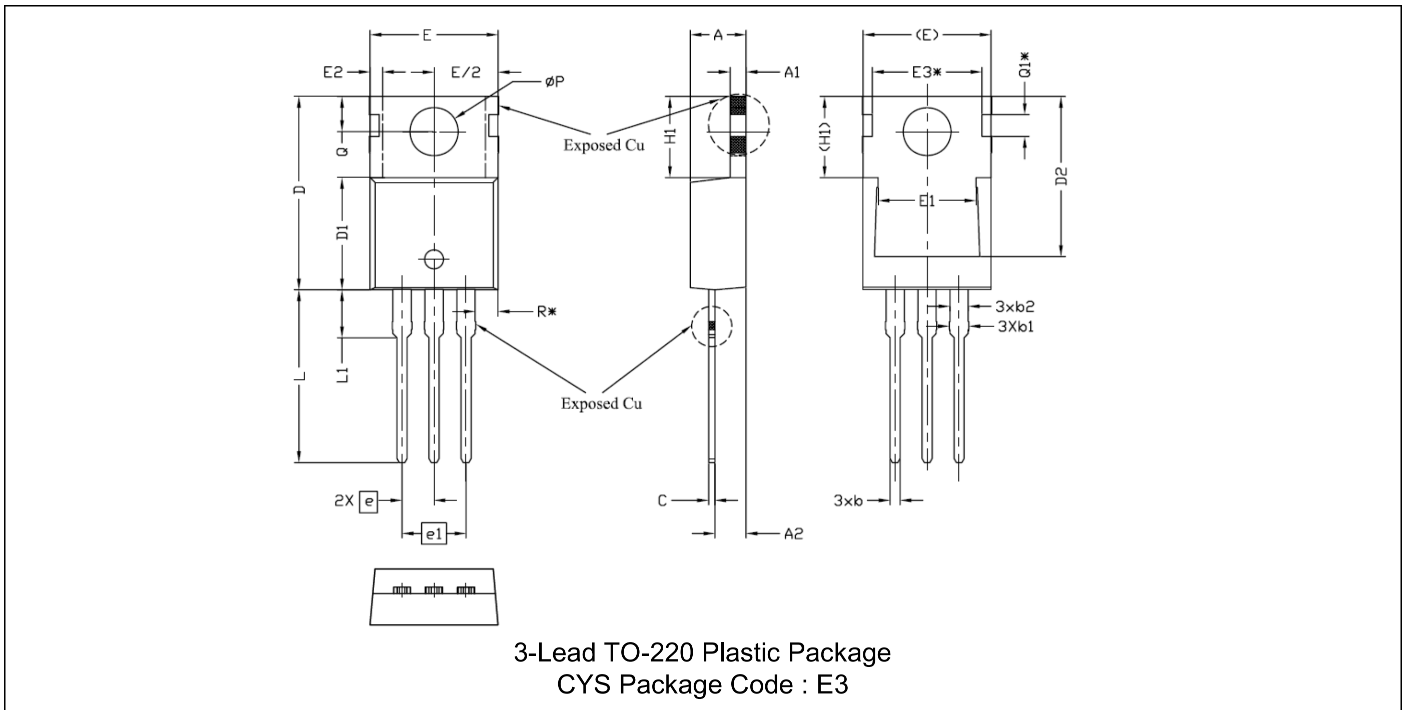




TO-220 Dimension



3-Lead TO-220 Plastic Package
CYS Package Code : E3

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.24	4.64	0.167	0.183	E2	-	0.76	-	0.030
A1	1.15	1.40	0.045	0.055	E3*	8.70	REF.	0.343	REF.
A2	2.30	2.70	0.091	0.106	e	2.54	BSC	0.100	BSC
b	0.70	0.90	0.028	0.035	e1	5.08	BSC	0.200	BSC
b1	1.20	1.75	0.047	0.069	H1	6.30	6.60	0.248	0.260
b2	1.20	1.70	0.047	0.067	L	13.47	13.97	0.530	0.550
c	0.40	0.60	0.016	0.024	L1	3.60	4.00	0.142	0.157
D	14.70	16.00	0.579	0.630	ØP	3.75	3.93	0.148	0.155
D1	8.82	9.02	0.347	0.355	Q	2.60	3.00	0.102	0.118
D2	12.43	12.83	0.489	0.505	Q1*	1.73	REF.	0.068	REF.
E	9.96	10.36	0.392	0.408	R*	1.82	REF.	0.072	REF.
E1	6.86	8.89	0.270	0.350					

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 CYStek sales office.
- "*" is reference.

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

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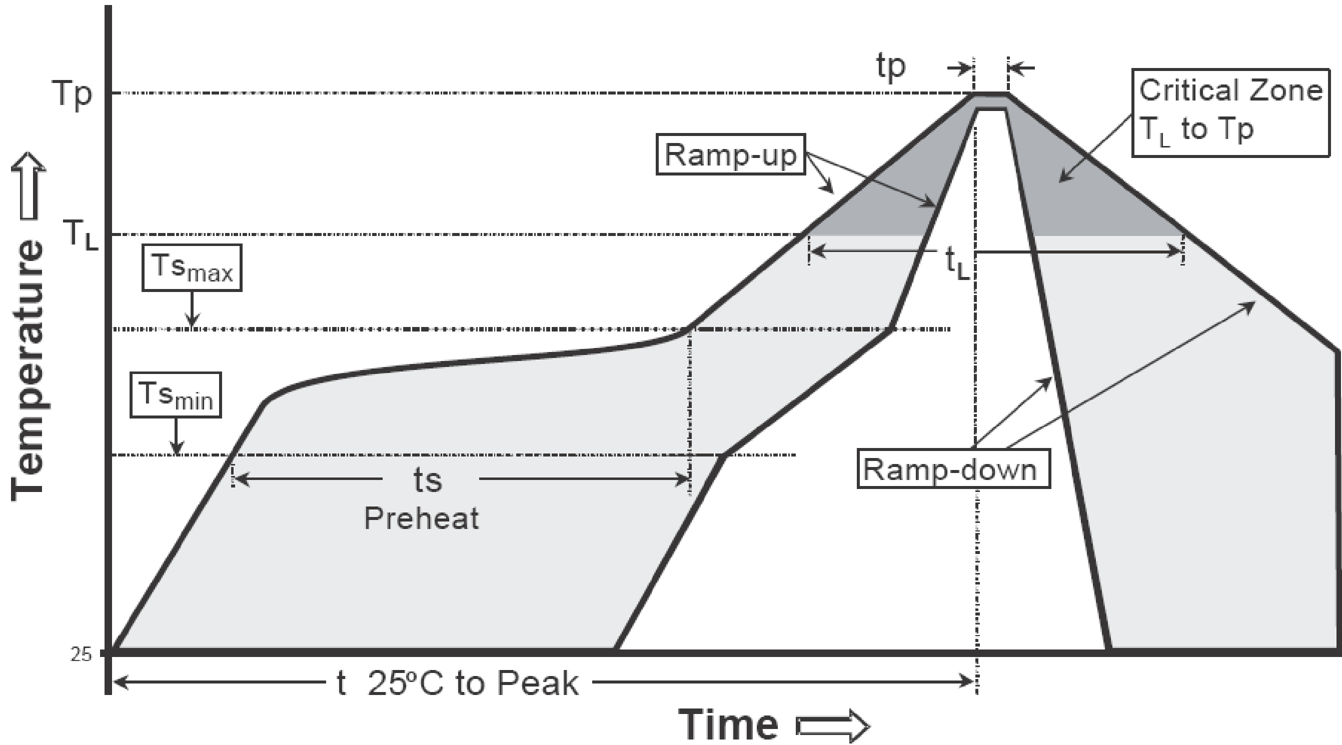
Recommended wave soldering condition

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_S max to T_P)	3°C/second max.	3°C/second max.
Preheat −Temperature Min (T_S min) −Temperature Max (T_S max) −Time (t_S min to t_S 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 (t_P)	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.