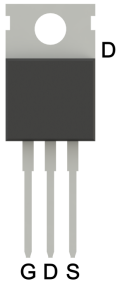
Product Summary

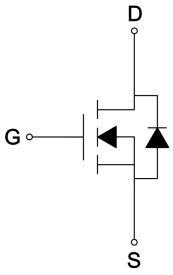
BV_{DSS}	150	V
$R_{DS(ON)}$ typ. @ V_{GS}=10V, I_D=6A	36	mΩ
I_D @ V_{GS}=10V, T_C=25°C	24	A
I_D @ V_{GS}=10V, T_A=25°C	7	

Features

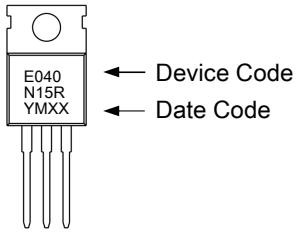
- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

TO-220





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
MTE040N15RE3-0-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}	150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	24	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		15	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		7	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		5.6	
Pulsed Drain Current	*c	I_{DM}	80	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	24	
Pulsed Body Diode Forward Current @ T_C=25°C	*a	I_{SM}	80	
Avalanche Current @ L=0.1mH		I_{AS}	10	
Avalanche Energy @ L=0.5mH		E_{AS}	9	mJ
Total Power Dissipation	T_C=25°C *a	P_D	60	W
	T_C=100°C *a		24	
	T_A=25°C *b		5.2	
	T_A=70°C *b		3.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C
Steady State Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	2.1	°C/W
Steady State Thermal Resistance, Junction-to-Ambient	*b	$R_{\theta JA}$	24	

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	150	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2	-	4		V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	8	-	S	V_{DS}=10V, I_D=6A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=120V, V_{GS}=0V
$R_{DS(ON)}$	-	36	48	mΩ	V_{GS}=10V, I_D=6A
Dynamic					
C_{iss}	-	970	-	pF	V_{DS}=75V, V_{GS}=0V, f=1MHz
C_{oss}	-	83	-		
C_{rss}	-	24	-		
R_g	-	0.7	-	Ω	f=1MHz
Q_g *d,e	-	17	-	nC	V_{DS}=75V, I_D=6A, V_{GS}=10V
Q_{gs} *d,e	-	4.9	-		
Q_{gd} *d,e	-	4.3	-		
$t_{d(ON)}$ *d,e	-	14	-	ns	V_{DS}=75V, I_D=6A, V_{GS}=10V, R_{GS}=1Ω
tr *d,e	-	17	-		
$t_{d(OFF)}$ *d,e	-	26	-		
t_f *d,e	-	7	-		
Source-Drain Diode					
V_{SD} *d	-	0.8	1.2	V	I_S=6A, V_{GS}=0V
t_{rr}	-	48	-	ns	I_F=6A, di/dt=100A/μs
Q_{rr}	-	94	-	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.

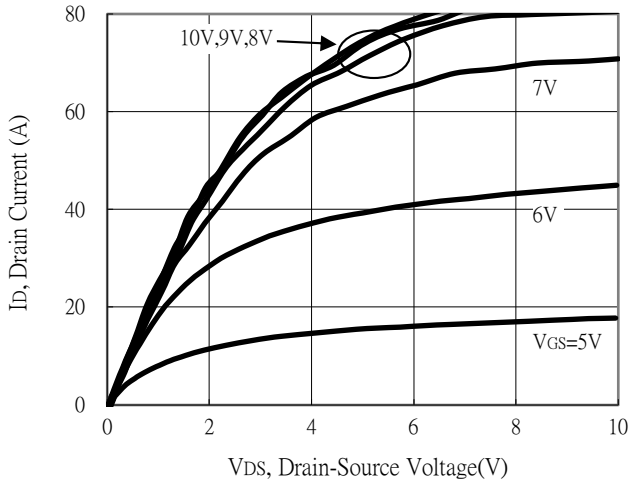
*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

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

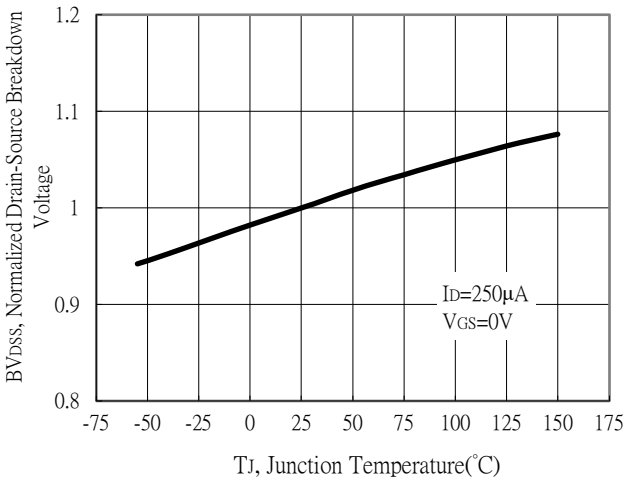
*e. Independent of operating temperature.

Typical Characteristics

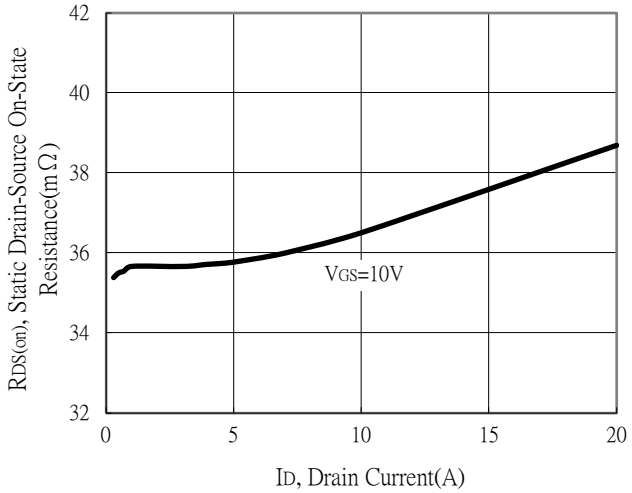
Typical Output Characteristics



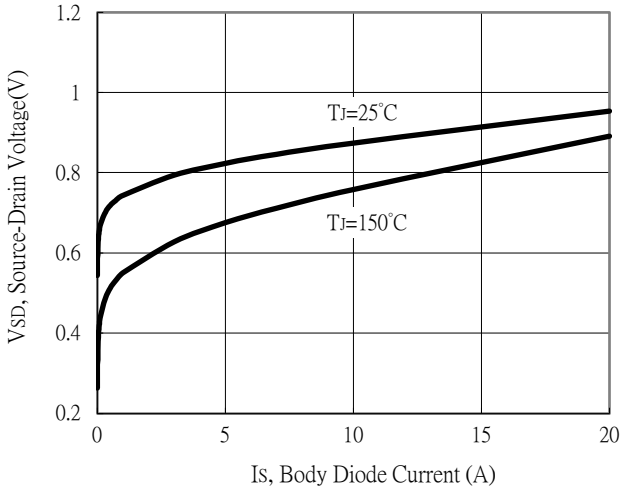
Breakdown Voltage vs Ambient Temperature



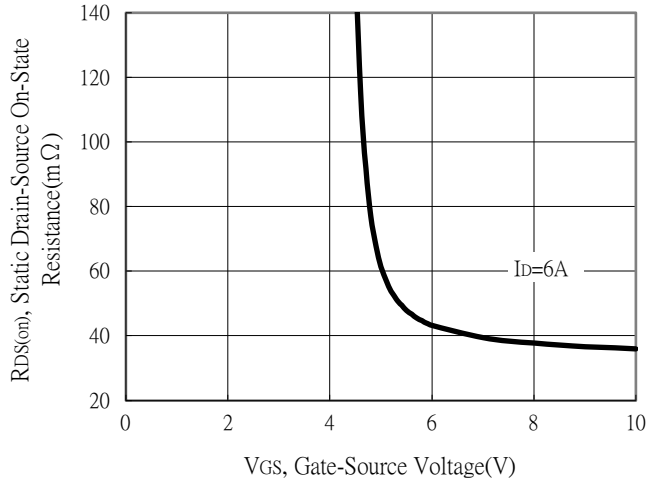
Static Drain-Source On-State resistance vs Drain Current



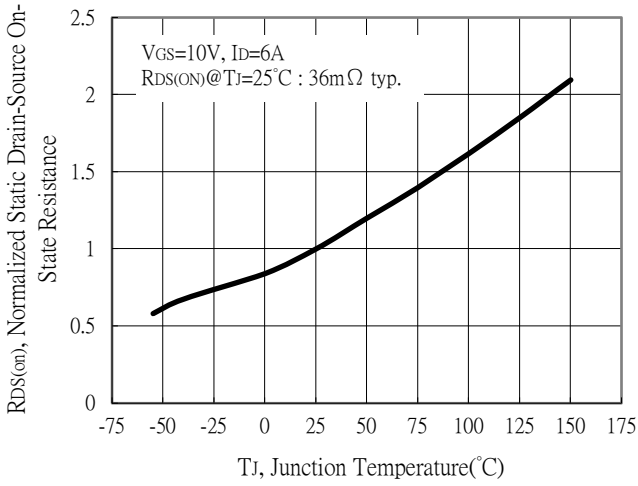
Body Diode Current vs Source-Drain Voltage



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

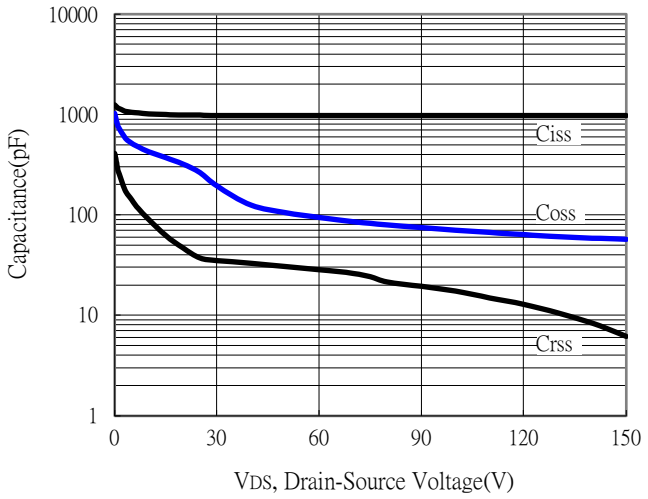


Drain-Source On-State Resistance vs Junction Temperature

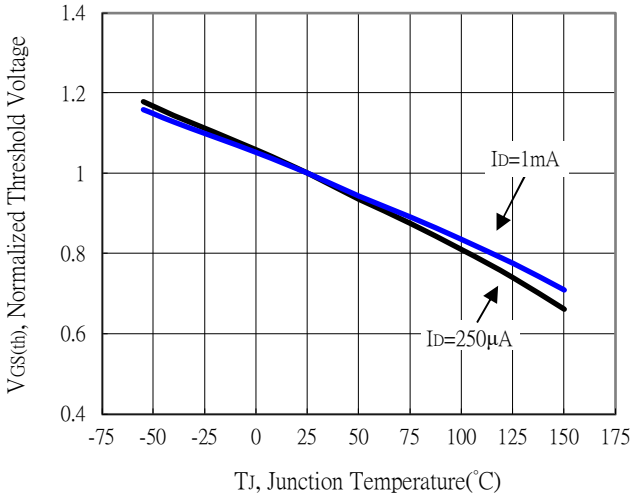


Typical Characteristics

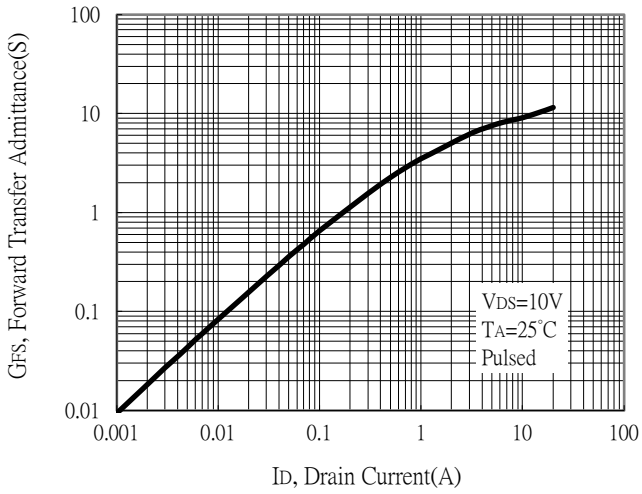
Capacitance vs Drain-to-Source Voltage



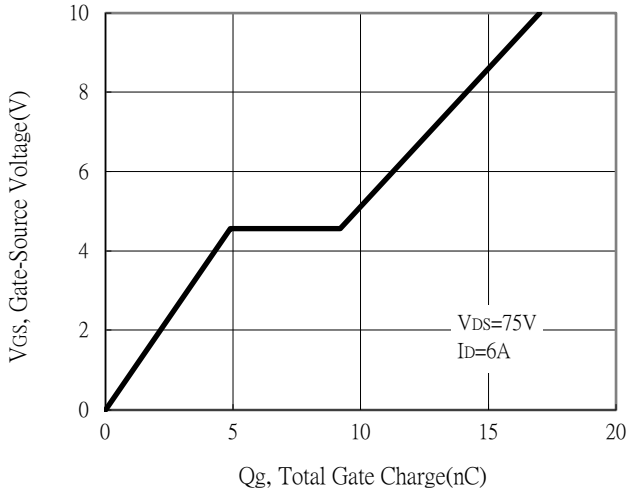
Threshold Voltage vs Junction Temperature



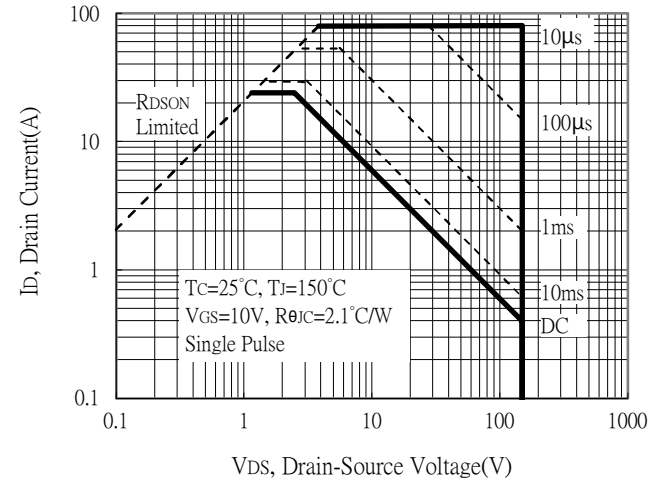
Forward Transfer Admittance vs Drain Current



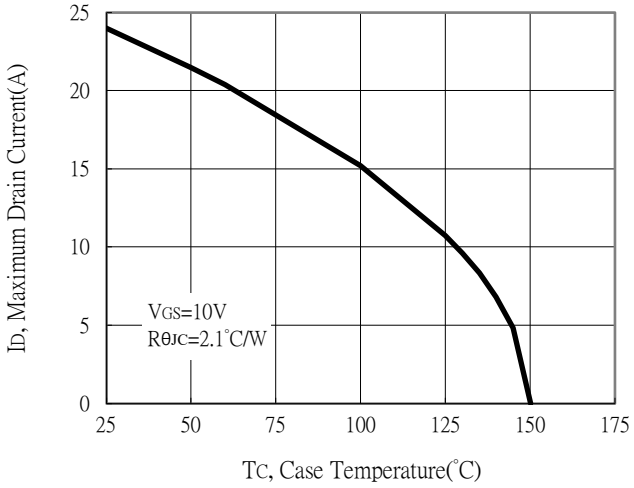
Gate Charge Characteristics



Maximum Safe Operating Area

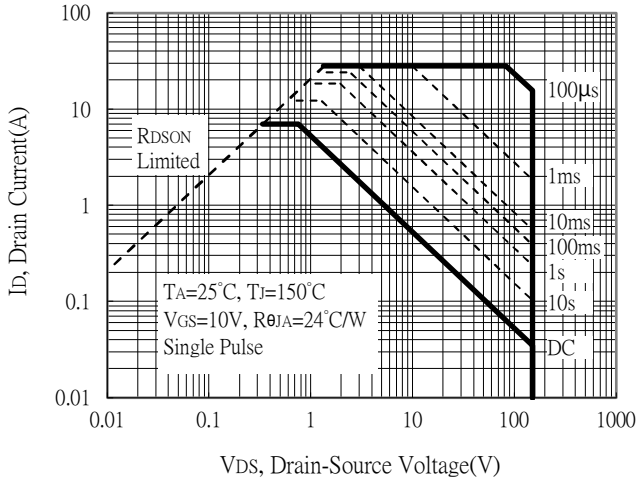


Maximum Drain Current vs Case Temperature

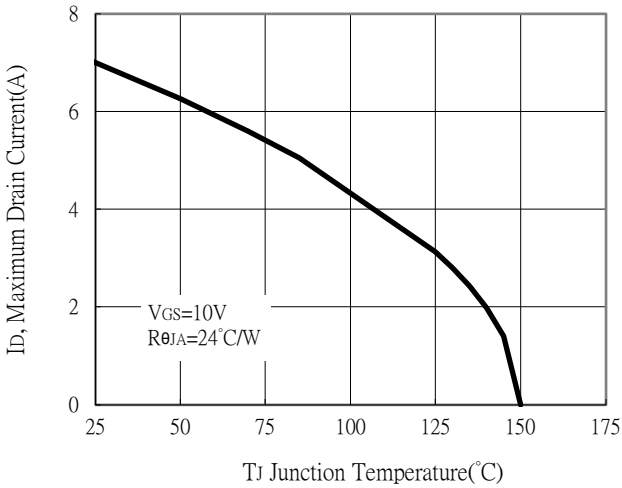


Typical Characteristics

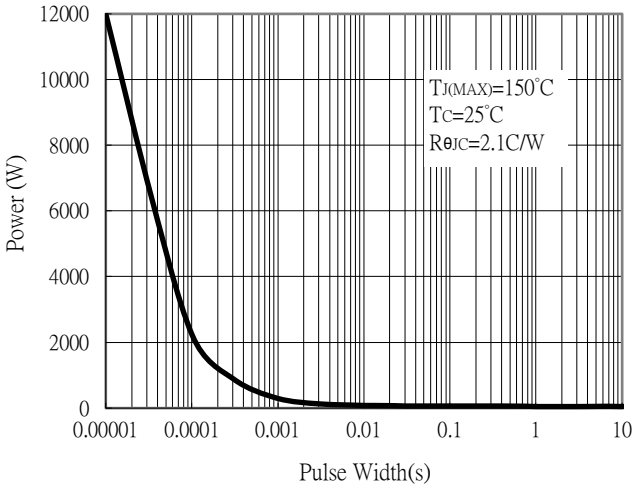
Maximum Safe Operating Area



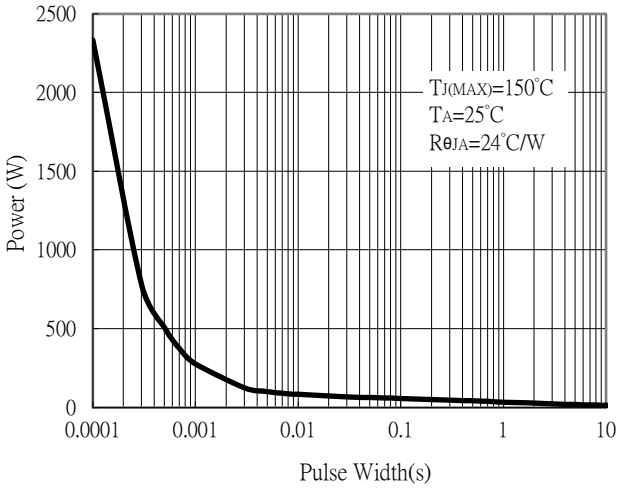
Maximum Drain Current vs Junction Temperature



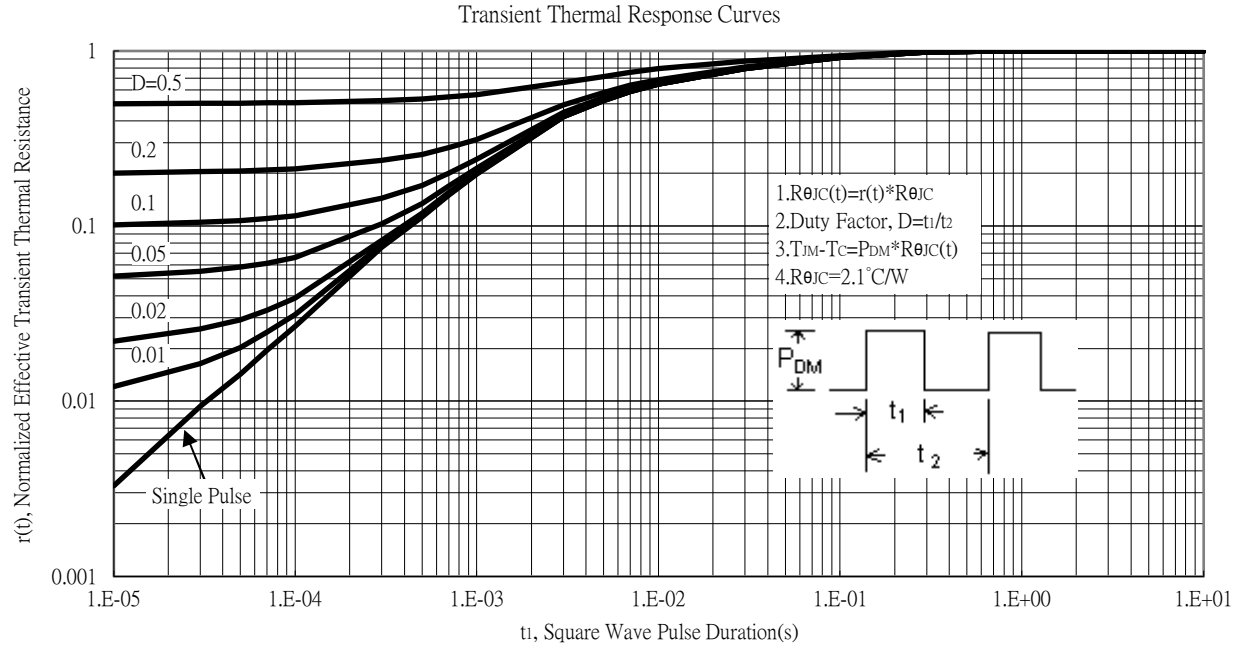
Single Pulse Power Rating, Junction to Case

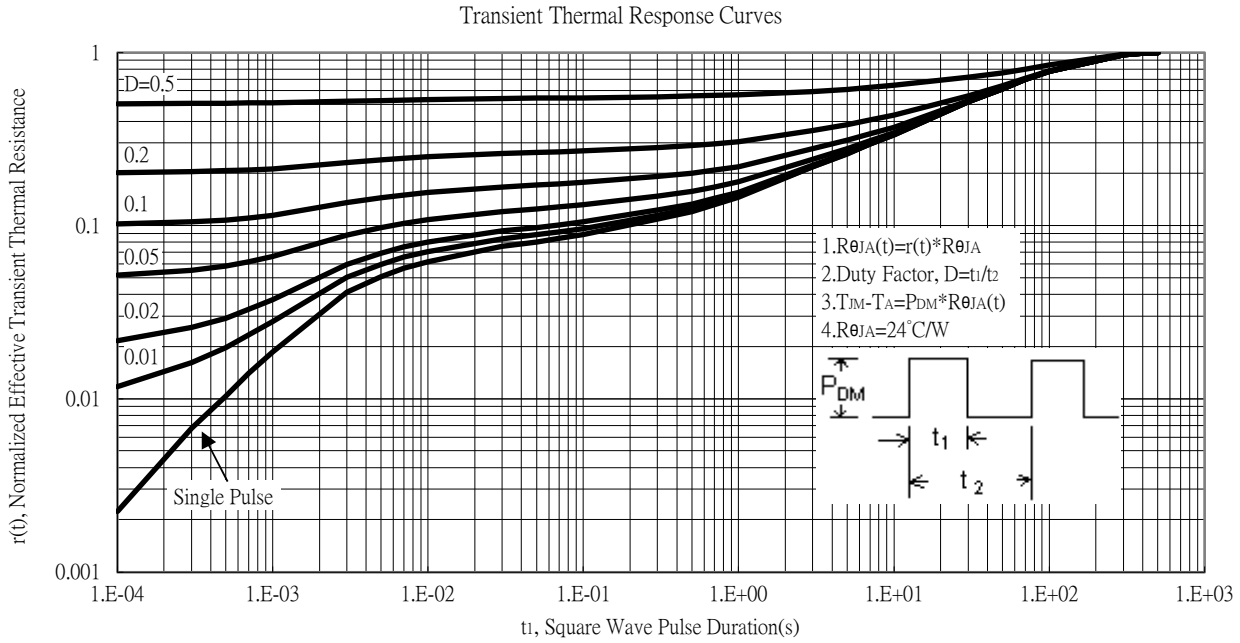


Single Pulse Power Rating, Junction to Ambient

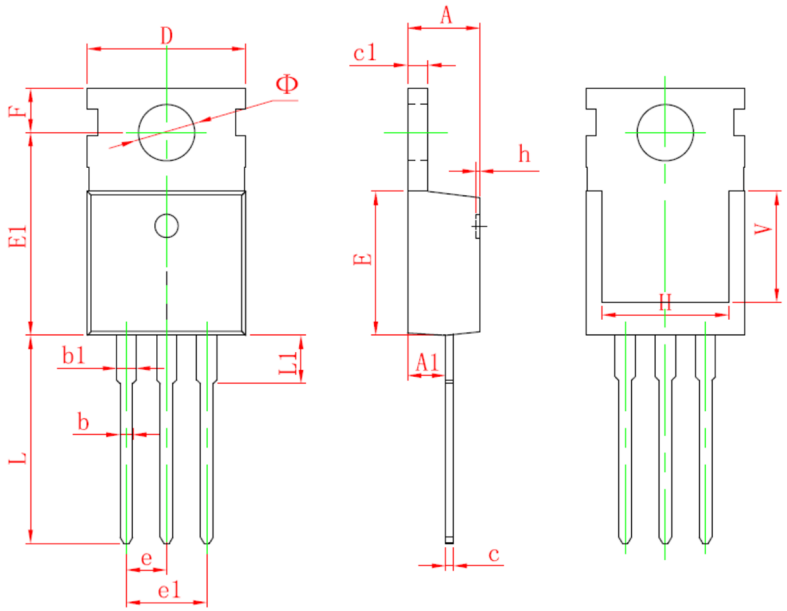


Typical Characteristics





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	4.400	4.600	0.173	0.181	e	2.540	TYP	0.100	TYP
A1	2.250	2.550	0.089	0.100	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	F	2.650	2.950	0.104	0.116
b1	1.170	1.370	0.046	0.054	H	7.900	8.100	0.311	0.319
c	0.330	0.650	0.013	0.026	h	0.000	0.300	0.000	0.012
c1	1.200	1.400	0.047	0.055	L	12.900	13.400	0.508	0.528
D	9.910	10.250	0.390	0.404	L1	2.850	3.250	0.112	0.128
E	8.950	9.750	0.352	0.384	V	7.500	REF	0.295	REF
E1	12.650	12.950	0.498	0.510	Φ	3.400	3.800	0.134	0.150

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.

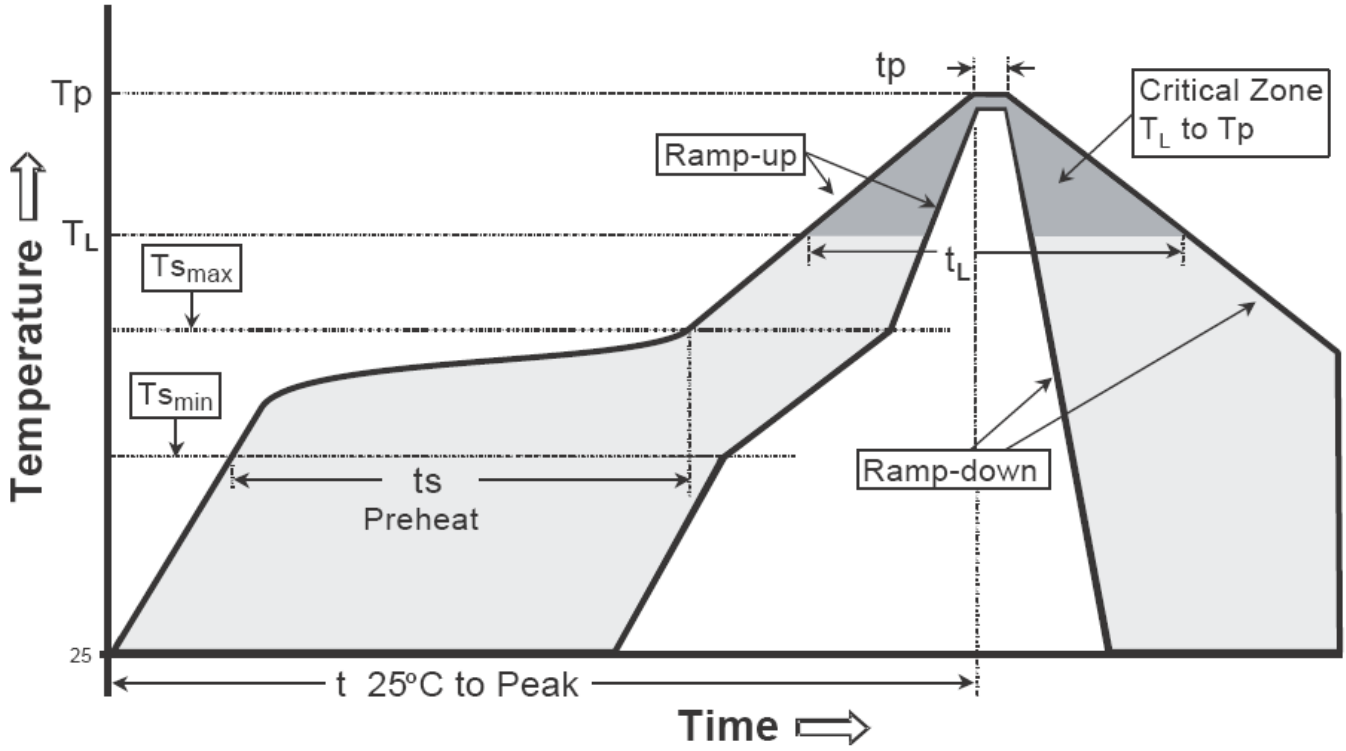
Material:

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

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.