N -Channel Enhancement Mode Power MOSFET

MTE1K8N25KJ3

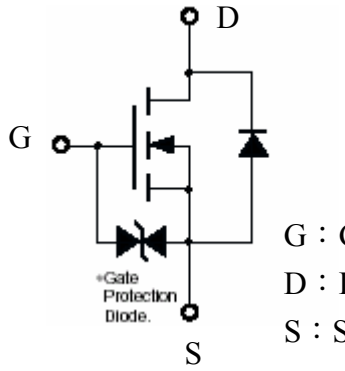
BV_{DSS}	**250V**
I_D	**2.5A**
$R_{DS(ON)}$@V_{GS}=10V, I_D=2A	**1.63Ω(typ)**
$R_{DS(ON)}$@V_{GS}=6V, I_D=1A	**1.41Ω(typ)**

Features

- Low Gate Charge
- Simple Drive Requirement
- RoHS compliant & Halogen-free package
- ESD protected

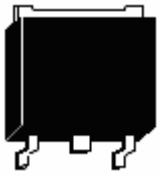
Equivalent Circuit

MTE1K8N25KJ3



Outline

TO-252(DPAK)



G D S

Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @ Tc=25°C, V_{GS}=10V	I_D	2.5	A
Continuous Drain Current @ Tc=100°C, V_{GS}=10V	I_D	1.6	
Pulsed Drain Current *1	I_{DM}	10	
ESD susceptibility *2		2000	V
Total Power Dissipation @Tc=25℃	Pd	25	W
Total Power Dissipation @Tc=100℃		10	
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+150	°C

Note : *1. Pulse width limited by maximum junction temperature
*2. Human body model, 1.5kΩ in series with 100pF

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	50 (Note 1)	
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	110 (Note 2)	

Note : 1.When mounted on PCB of 1 in^2 pad area, t≤10s.
2. When mounted on the minimum pad size recommended (PCB mount), t≤10s.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	250	-	-	V	V_{GS}=0V, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.3	-	V/°C	Reference to 25°C, I_D=250μA
$V_{GS(th)}$	1.5	2.3	3.5	V	V_{DS} =V_{GS}, I_D=250μA
G_{FS} *1	-	2.4	-	S	V_{DS} =15V, I_D=2A
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS} =200V, V_{GS} =0V
	-	-	25		V_{DS} =200V, V_{GS} =0V, Tj=125°C
$R_{DS(ON)}$ *1	-	1.63	2.2	Ω	V_{GS} =10V, I_D=2A
	-	1.41	2		V_{GS} =6V, I_D=1A
Dynamic					
Qg *1, 2	-	4.5	-	nC	I_D=2.5A, V_{DS}=200V, V_{GS}=10V
Qgs *1, 2	-	1	-		
Qgd *1, 2	-	1.5	-		
$t_{d(ON)}$ *1, 2	-	12	-	ns	V_{DS}=125V, I_D=1A, V_{GS}=10V, R_G=6Ω
tr *1, 2	-	11	-		
$t_{d(OFF)}$ *1, 2	-	13	-		
t_f *1, 2	-	8	-		
Ciss	-	215	-	pF	V_{GS}=0V, V_{DS}=25V, f=1MHz
Coss	-	16	-		
Crss	-	7.7	-		
Source-Drain Diode					
I_S *1	-	-	2.5	A	
I_{SM} *3	-	-	10		
V_{SD} *1	-	0.79	1.2	V	I_S=1A, V_{GS}=0V
trr	-	80	-	ns	I_F=1A, dI_F/dt=100A/μs
Qrr	-	330	-	nC	

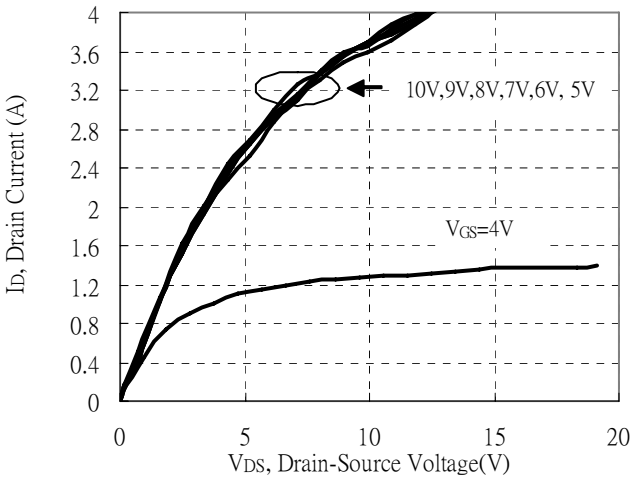
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Ordering Information

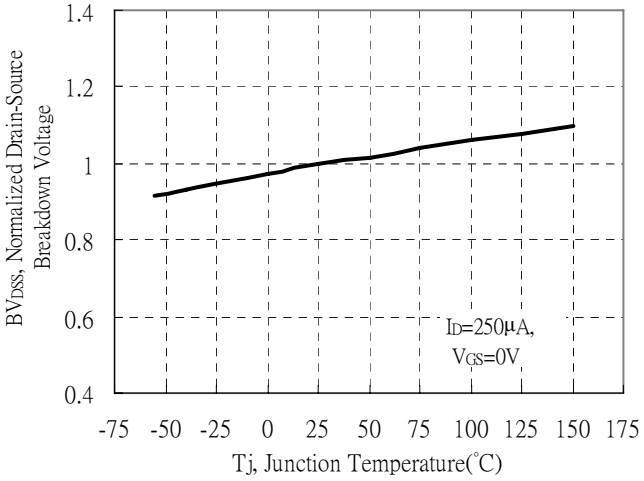
Device	Package	Shipping
MTE1K8N25KJ3-0-T3-G	TO-252 (RoHS compliant & Halogen-free package)	2500 pcs / Tape & Reel

Typical Characteristics

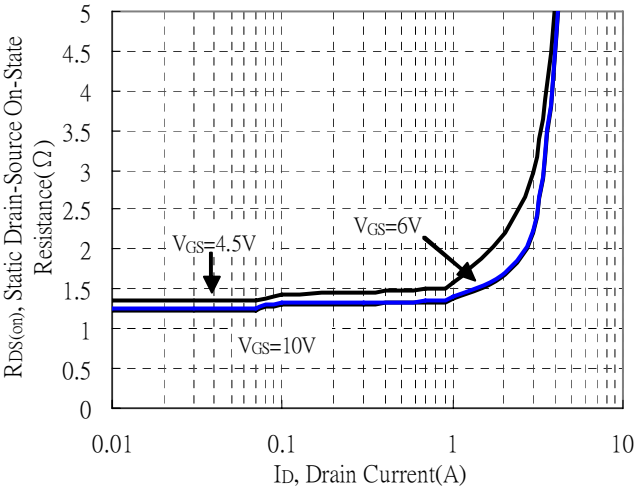
Typical Output Characteristics



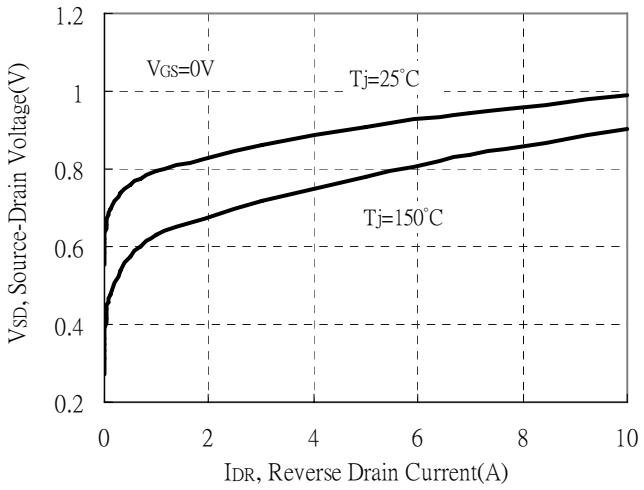
Brekdown Voltage vs Ambient Temperature



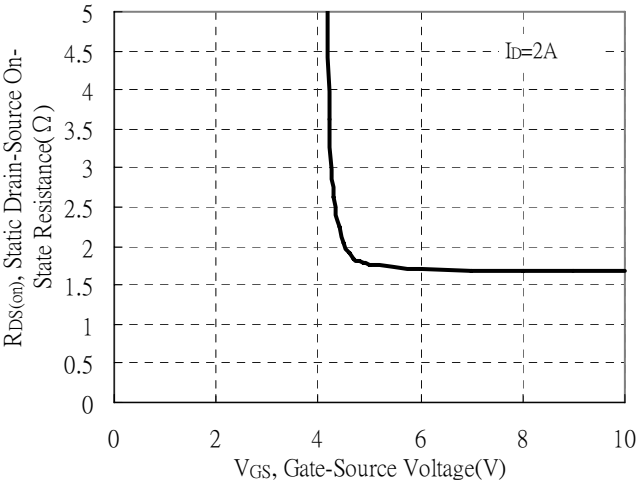
Static Drain-Source On-State resistance vs Drain Current



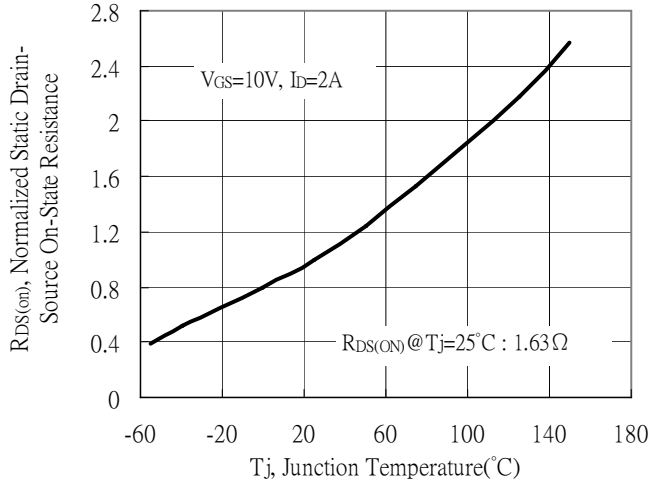
Reverse Drain Current vs Source-Drain Voltage



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

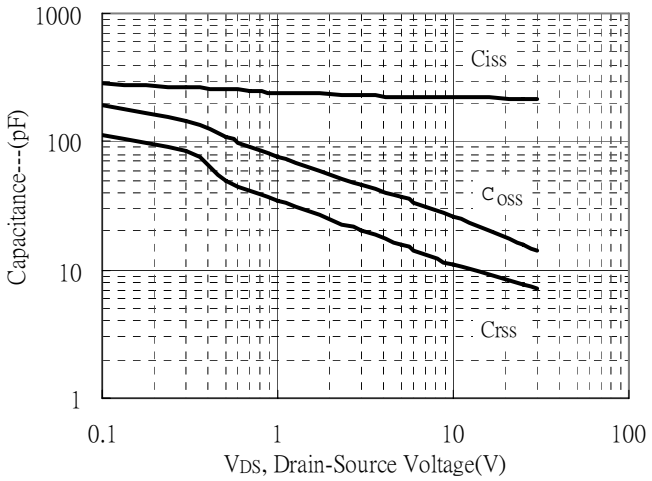


Drain-Source On-State Resistance vs Junction Tempearture

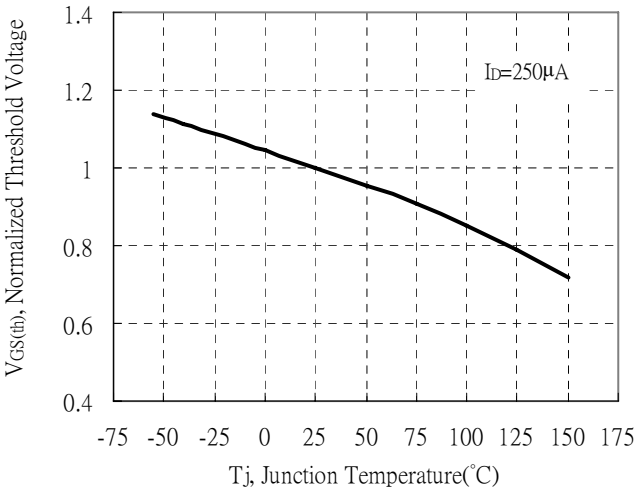


Typical Characteristics(Cont.)

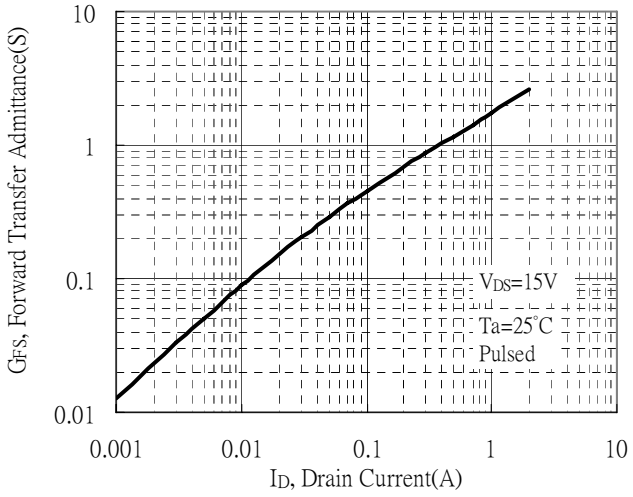
Capacitance vs Drain-to-Source Voltage



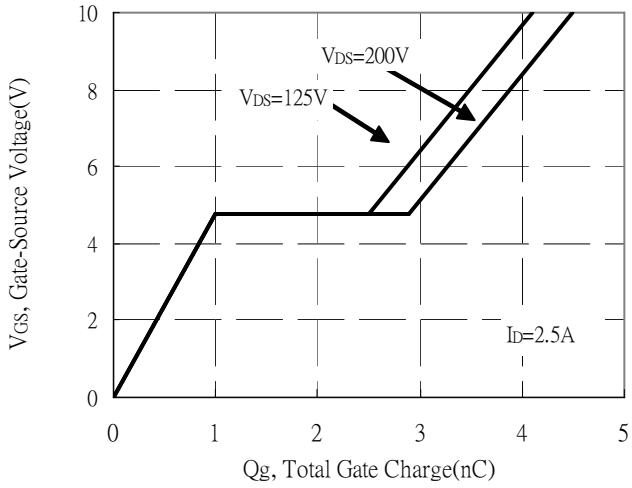
Threshold Voltage vs Junction Tempearture



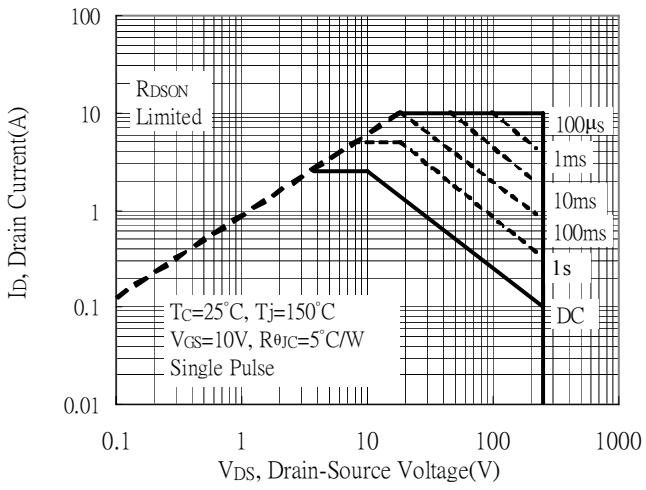
Forward Transfer Admittance vs Drain Current



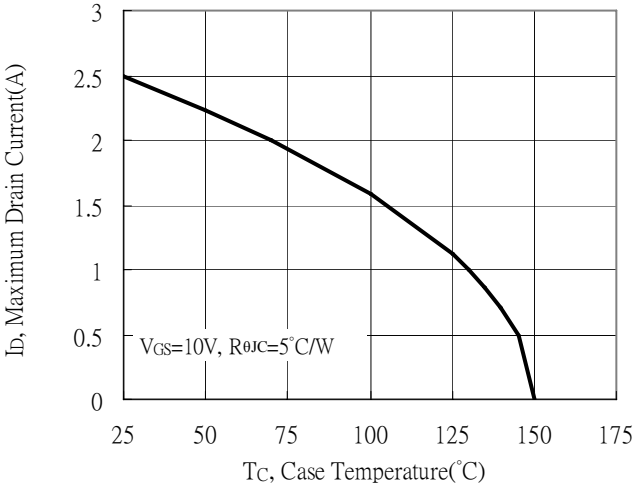
Gate Charge Characteristics



Maximum Safe Operating Area

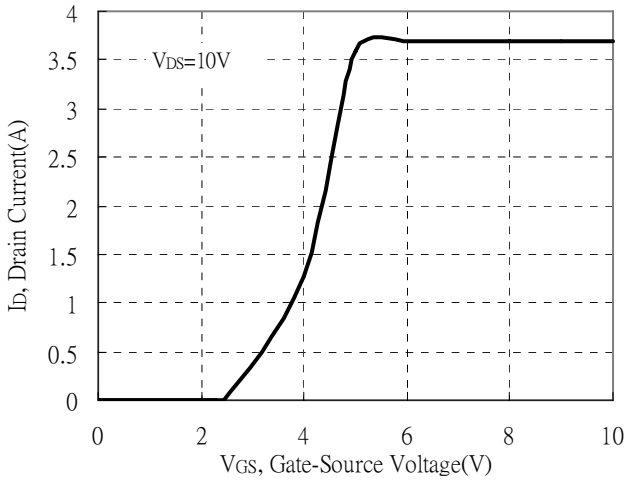


Maximum Drain Current vs Case Temperature

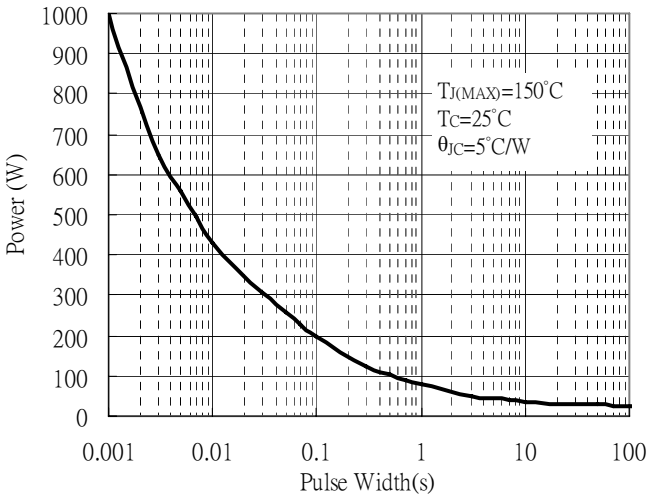


Typical Characteristics(Cont.)

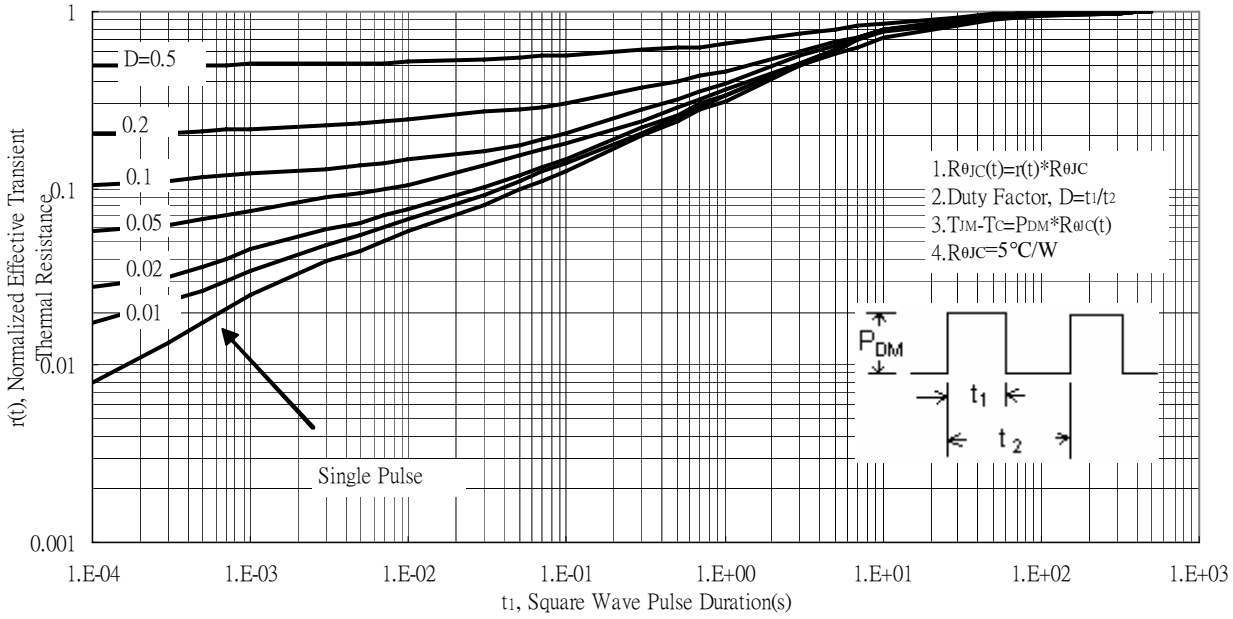
Typical Transfer Characteristics



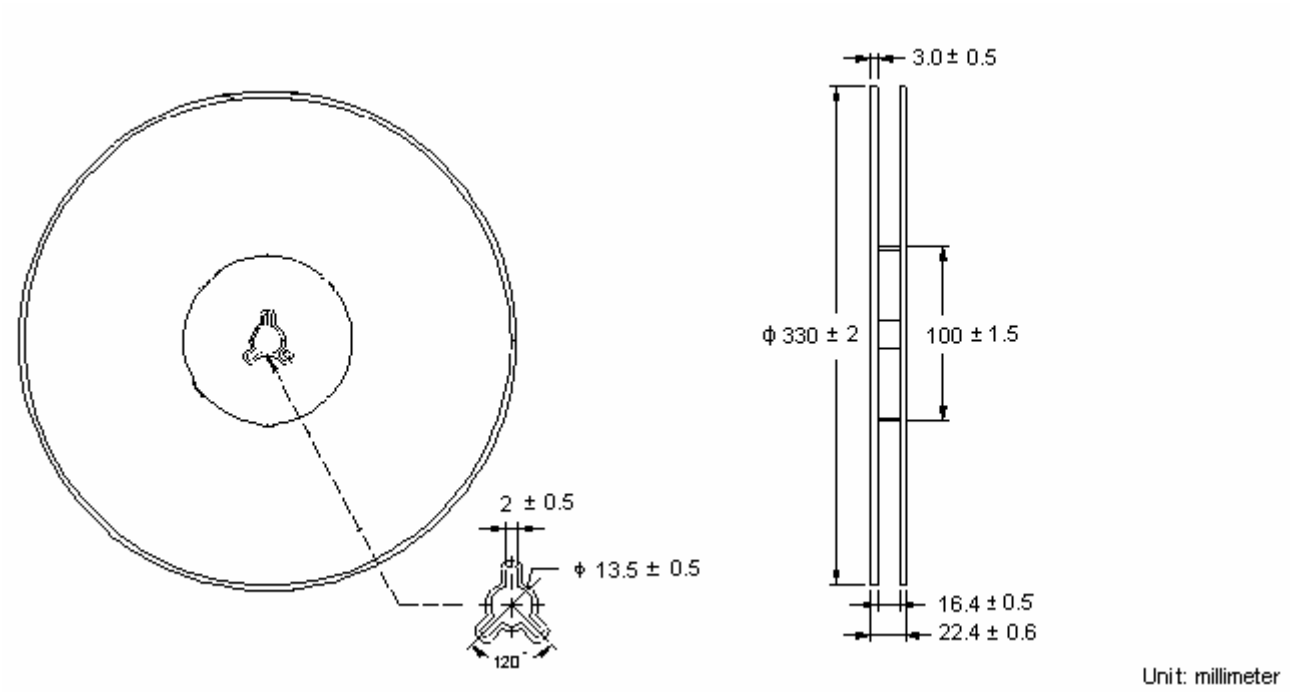
Single Pulse Power Rating, Junction to Case



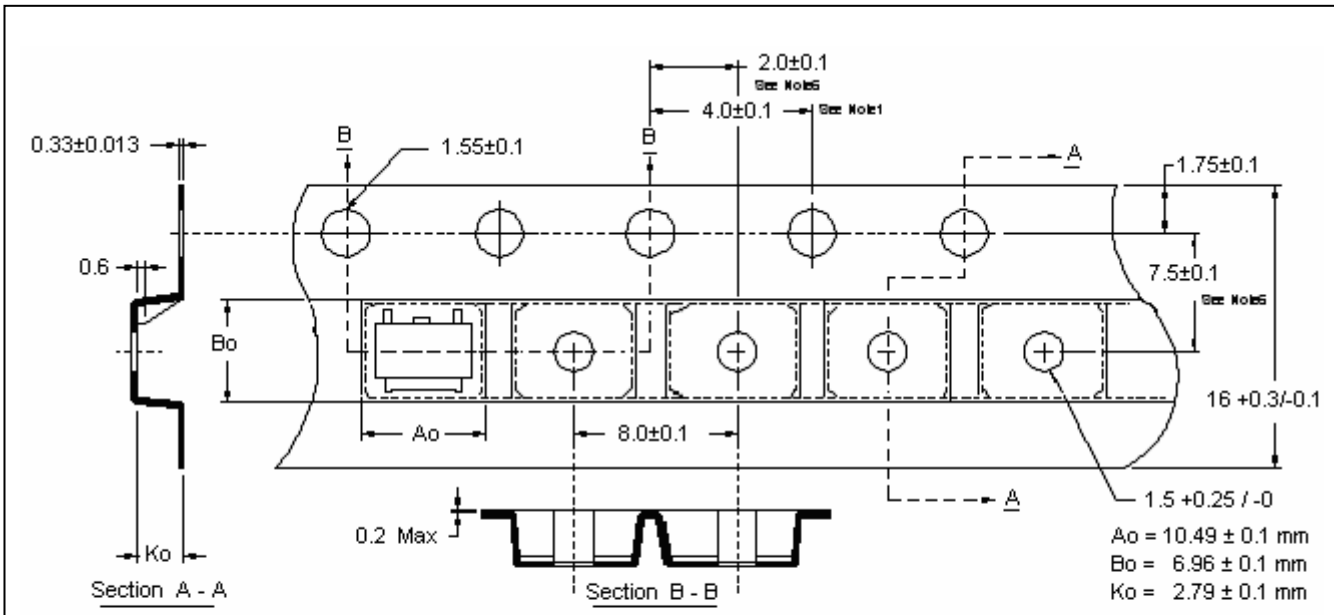
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension



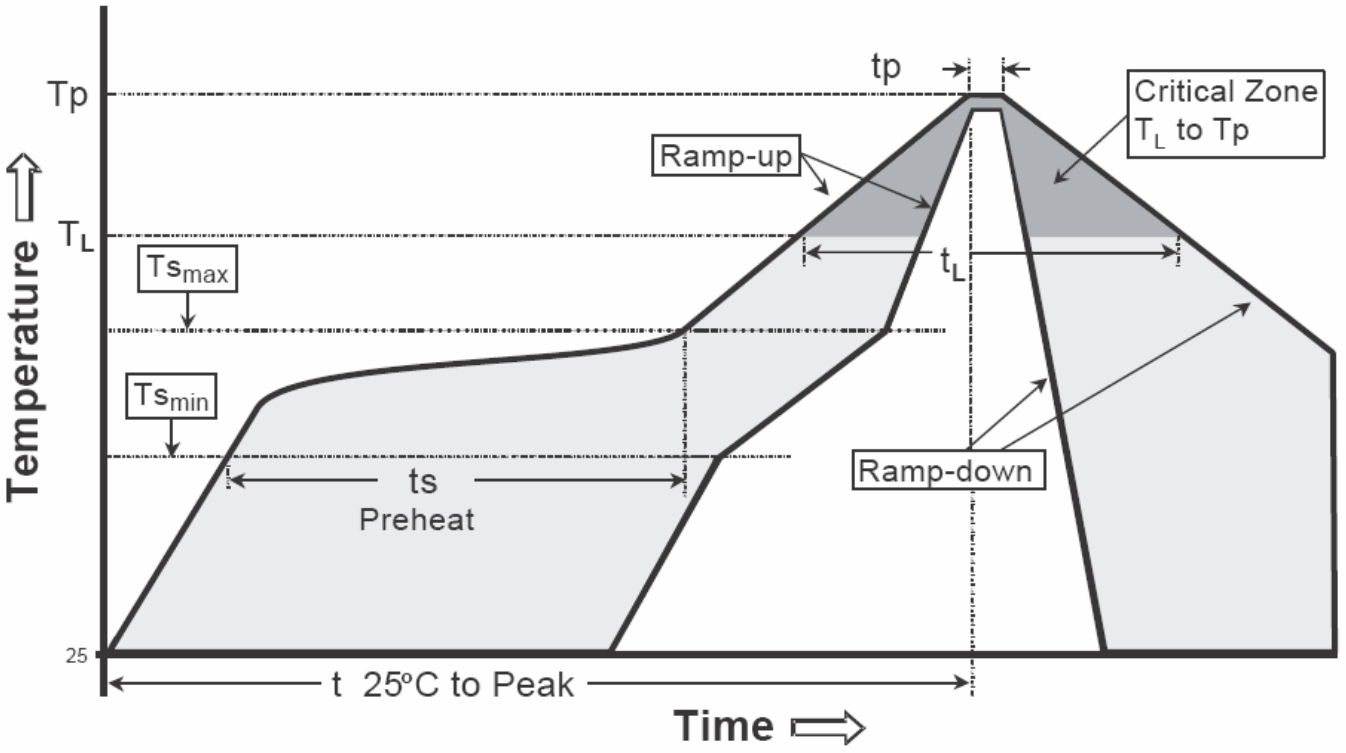
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive black polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. 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

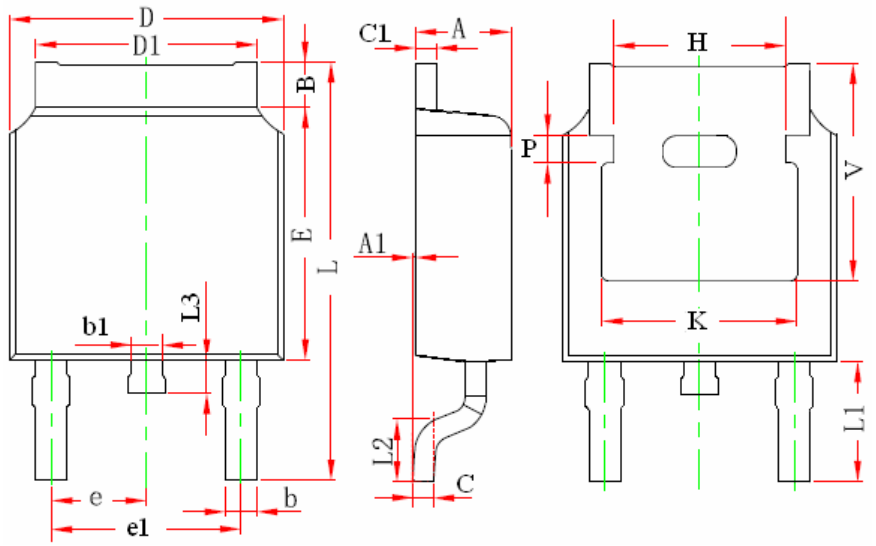
Recommended temperature profile for IR reflow

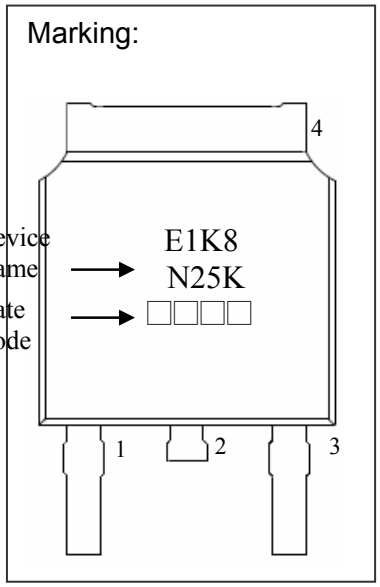


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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(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-252 Dimension





3-Lead TO-252 Plastic Surface Mount Package
CYStek Package Code: J3

Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	e	0.086	0.094	2.186	2.386
A1	0.000	0.005	0.000	0.127	e1	0.172	0.188	4.372	4.772
B	0.039	0.048	0.990	1.210	H	0.163	REF	4.140	REF
b	0.026	0.034	0.660	0.860	K	0.190	REF	4.830	REF
b1	0.026	0.034	0.660	0.860	L	0.386	0.409	9.800	10.400
C	0.018	0.023	0.460	0.580	L1	0.114	REF	2.900	REF
C1	0.018	0.023	0.460	0.580	L2	0.055	0.067	1.400	1.700
D	0.256	0.264	6.500	6.700	L3	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	P	0.026	REF	0.650	REF
E	0.236	0.244	6.000	6.200	V	0.211	REF	5.350	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.