20V N-CHANNEL Enhancement Mode MOSFET

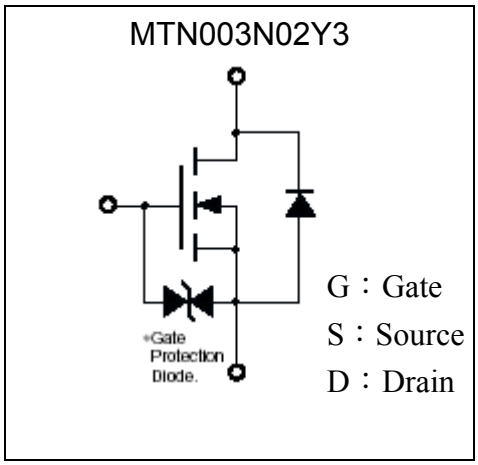
MTN003N02Y3

BV_{DSS}	20V
I_D	560mA
R_{DSON}@V_{GS}=4V, I_D=300mA	290mΩ(typ)
R_{DSON}@V_{GS}=2.5V,I_D=300mA	440mΩ(typ)
R_{DSON}@V_{GS}=1.8V,I_D=300mA	845mΩ(typ)

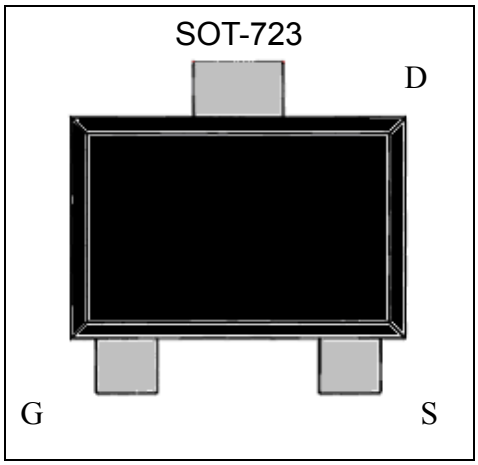
Features

- Simple drive requirement
- Small package outline
- ESD protected gate
- Pb-free lead plating and halogen-free package

Symbol

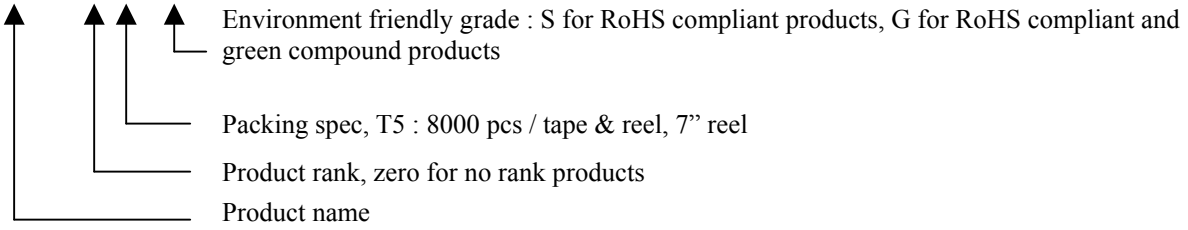


Outline



Ordering Information

Device	Package	Shipping
MTN003N02Y3-0-T5-G	SOT-723 (Pb-free lead plating and halogen-free package)	8000 pcs / tape & reel



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current @ T_A=25°C, V_{GS}=4.5V (Note 3)		I_D	560	mA
Continuous Drain Current @ T_A=85°C, V_{GS}=4.5V (Note 3)			400	
Pulsed Drain Current (Notes 1, 2)		I_{DM}	2.5	A
Maximum Power Dissipation (Note 3)	T_A=25℃	P_D	150	mW
	T_A=85℃		80	
ESD susceptibility			2000 (Note 4)	V
Operating Junction and Storage Temperature		Tj, Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3.Surface mounted on FR-4 board.
3. Human body model, 1.5kΩ in series with 100pF

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	Rth,ja	833	°C/W

Electrical Characteristics (Tj=25°C, unless otherwise noted)

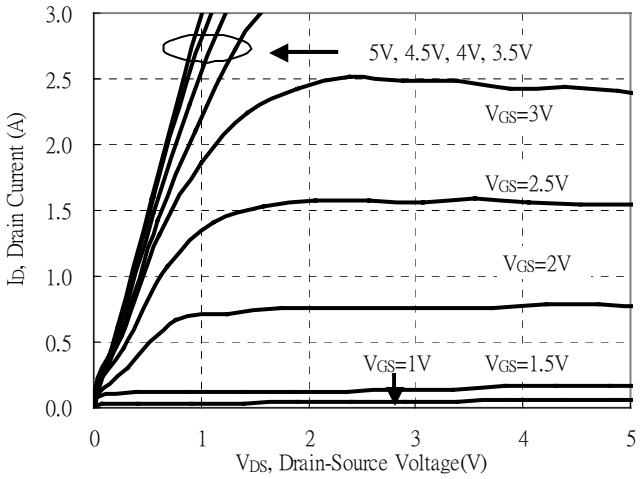
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.02	-	V/°C	Reference to 25°C, I_D=1mA
$V_{GS(th)}$	0.5	0.92	1.2	V	V_{DS}=10V, I_D=1mA
I_{GSS}	-	-	±10	μA	V_{GS}=±8V, V_{DS}=0
I_{DSS}	-	-	1		V_{DS}=20V, V_{GS}=0
	-	-	10		V_{DS}=16V, V_{GS}=0 (Tj=70°C)
*$R_{DS(ON)}$	-	290	400	mΩ	V_{GS}=4V, I_D=300mA
	-	440	600		V_{GS}=2.5V, I_D=300mA
	-	845	1200		V_{GS}=1.8V, I_D=300mA
*G_{FS}	-	0.9	-	S	V_{DS}=10V, I_D=300mA
Dynamic					
Ciss	-	60	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
Coss	-	14	-		
Crss	-	9	-		

$t_{d(ON)}$	-	5	-	ns	V_{DS}=10V, I_D=150mA, V_{GS}=4VR_G=10Ω
t_r	-	5	-		
$t_{d(OFF)}$	-	24	-		
t_f	-	18	-		
Qg	-	0.76	-	nC	V_{DS}=10V, I_D=250mA, V_{GS}=4.5V
Qgs	-	0.074	-		
Qgd	-	0.27	-		
Source-Drain Diode					
*V_{SD}	-	0.75	1.2	V	V_{GS}=0V, I_S=100mA

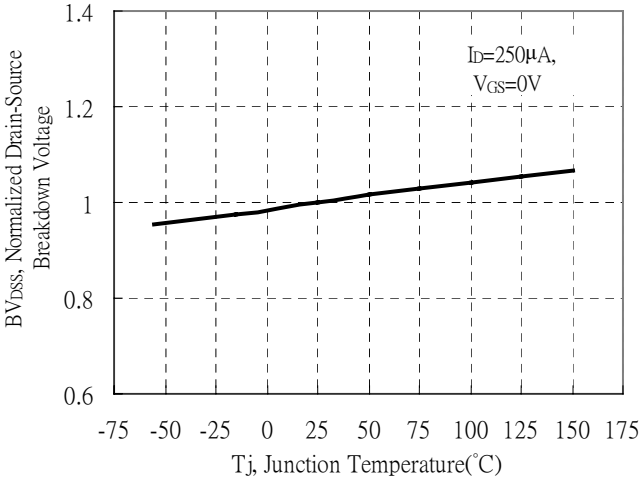
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

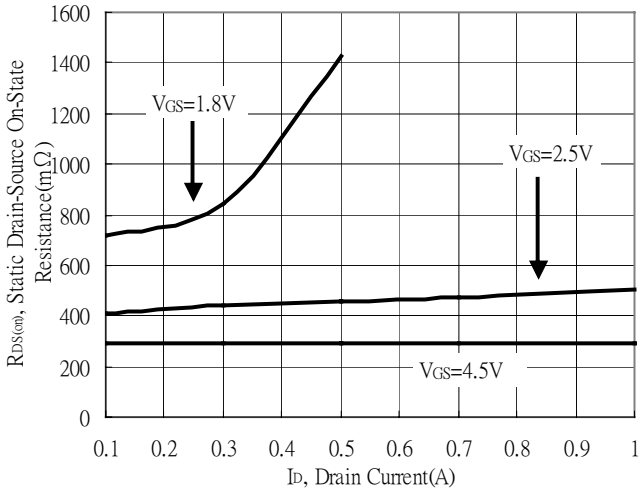
Typical Output Characteristics



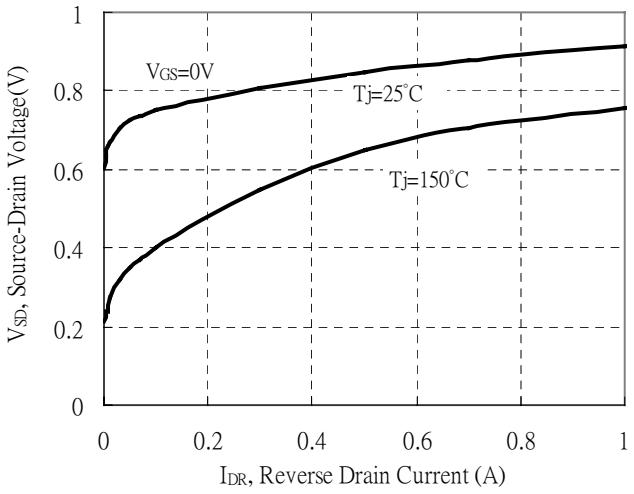
Brekdown Voltage vs Ambient Temperature



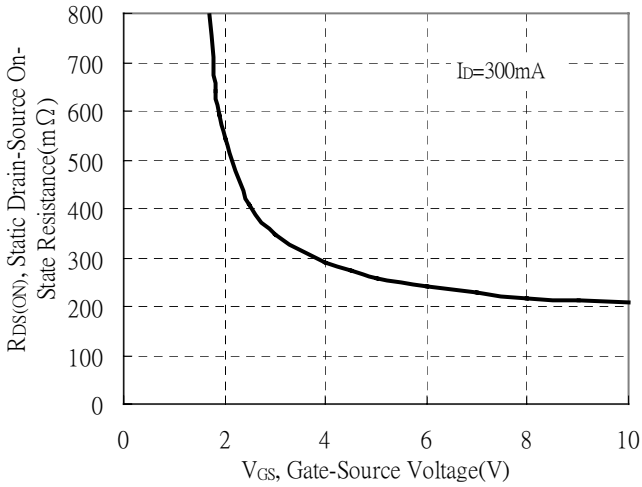
Static Drain-Source On-State resistance vs Drain Current



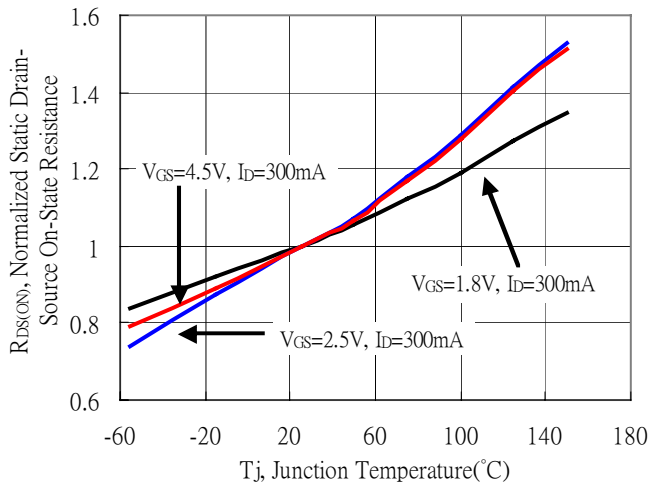
Reverse Drain Current vs Source-Drain Voltage



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

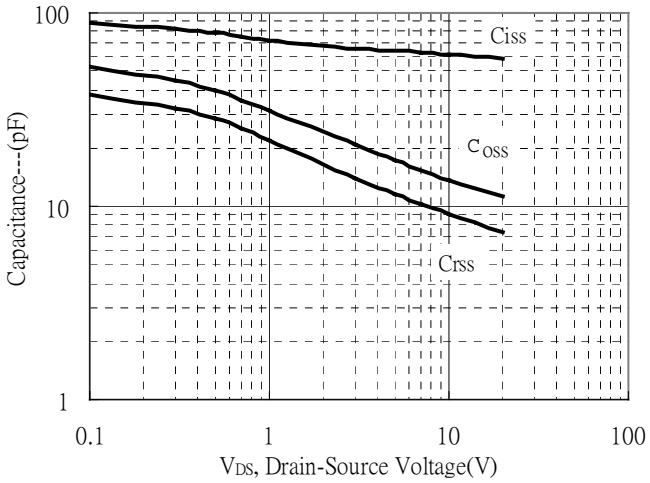


Drain-Source On-State Resistance vs Junction Tempearture

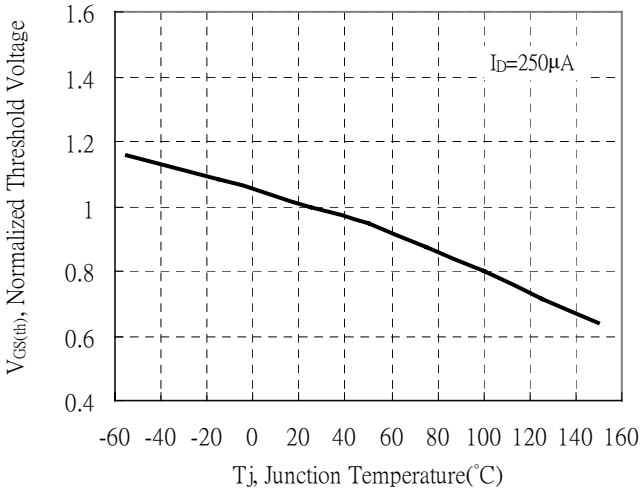


Typical Characteristics(Cont.)

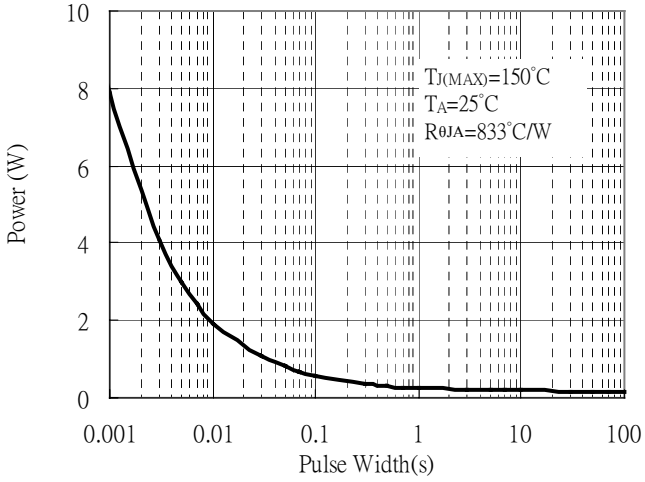
Capacitance vs Drain-to-Source Voltage



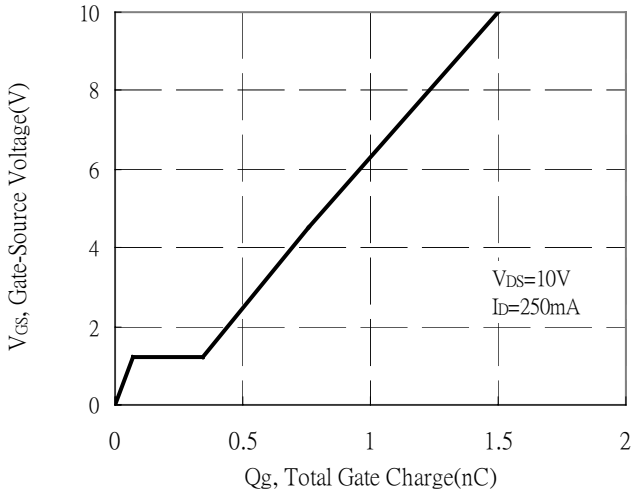
Threshold Voltage vs Junction Tempearture



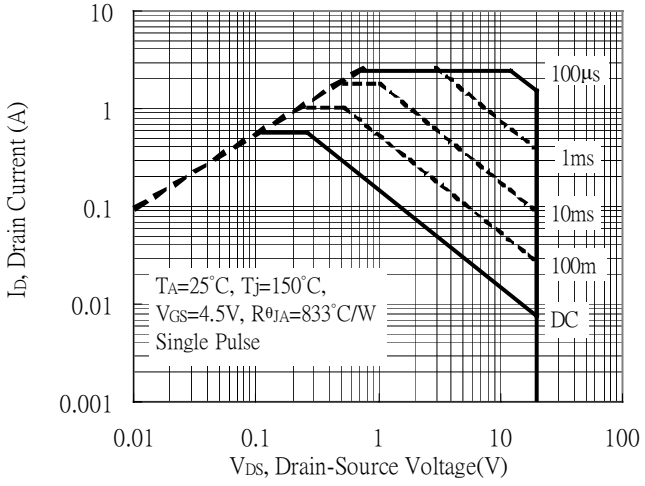
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



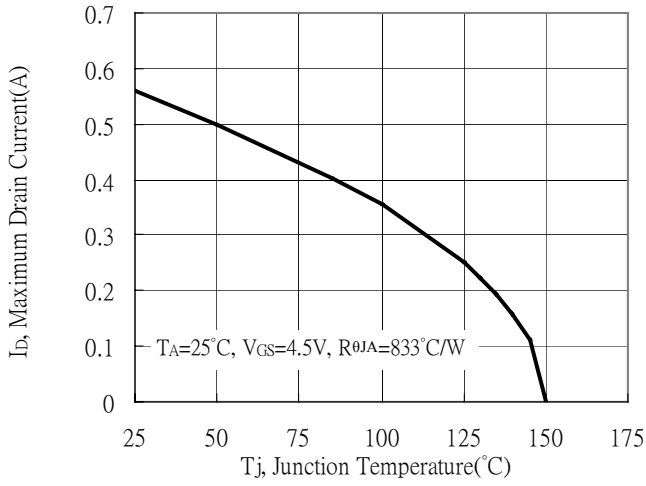
Gate Charge Characteristics



Maximum Safe Operating Area

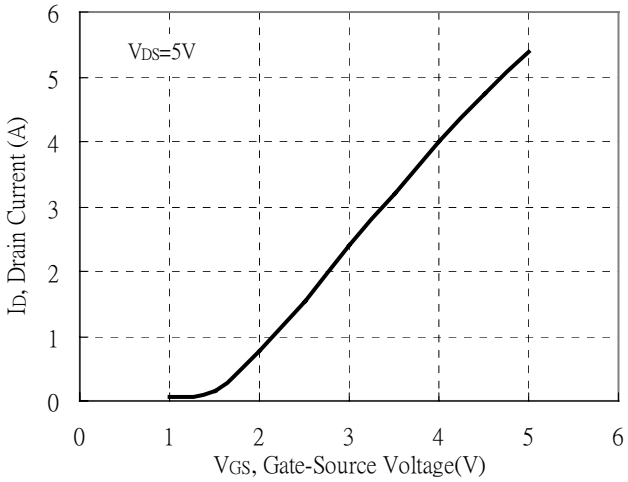


Maximum Drain Current vs JunctionTemperature

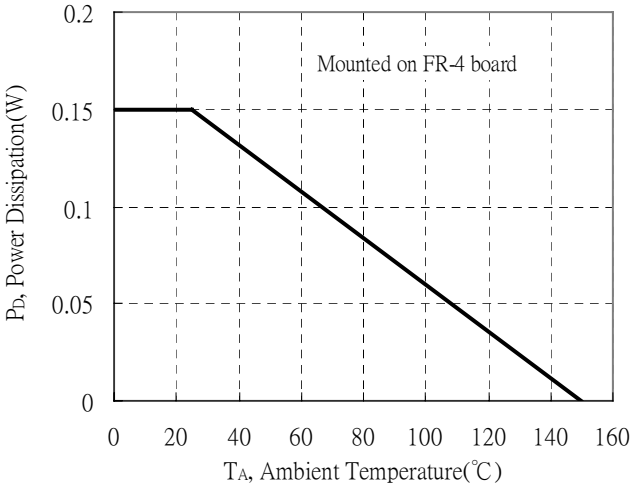


Typical Characteristics(Cont.)

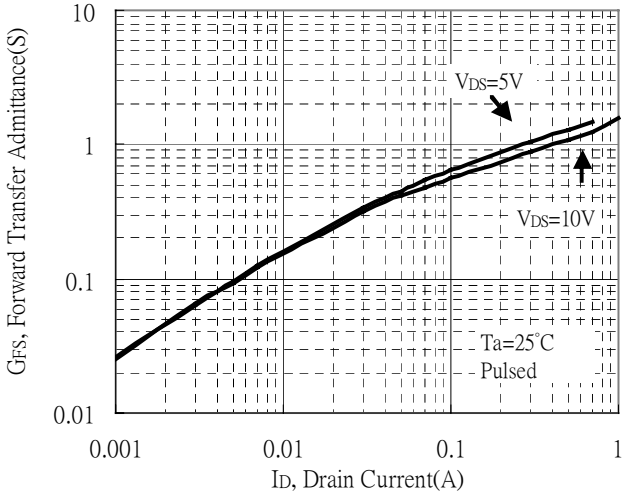
Typical Transfer Characteristics



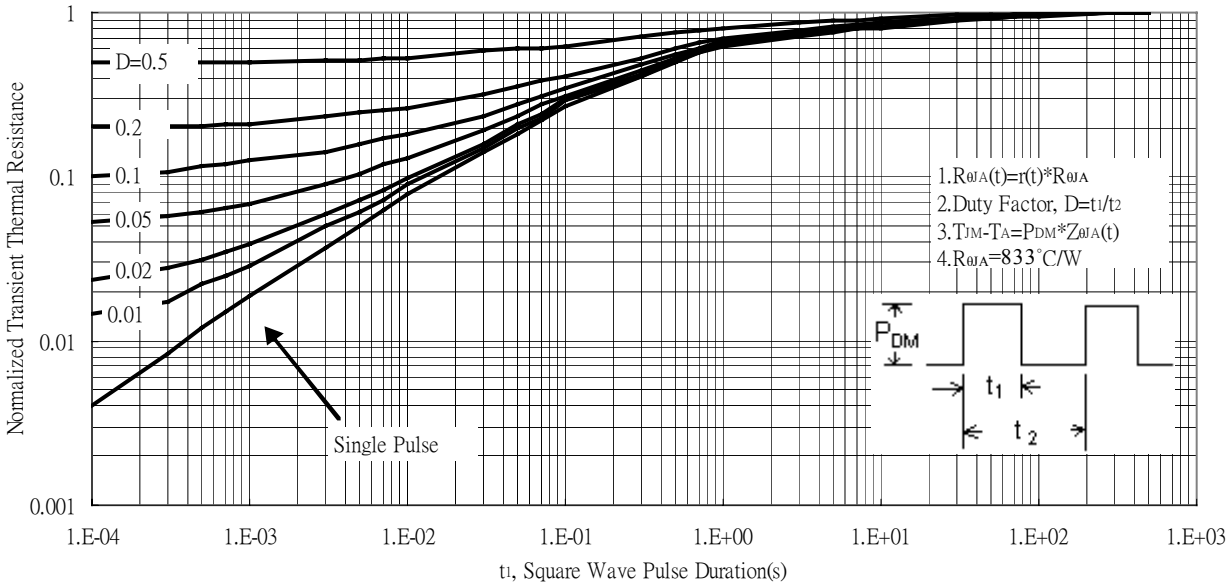
Power Derating Curve



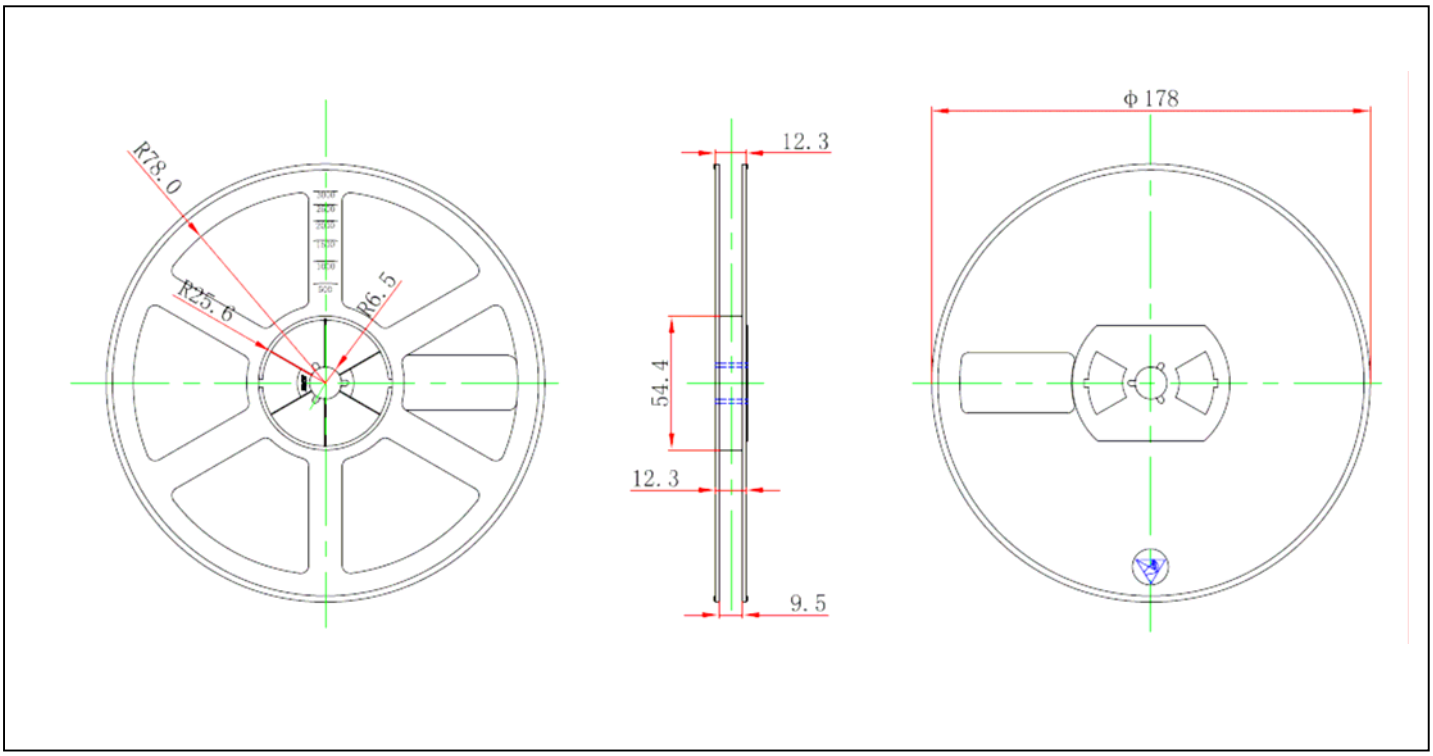
Forward Transfer Admittance vs Drain Current



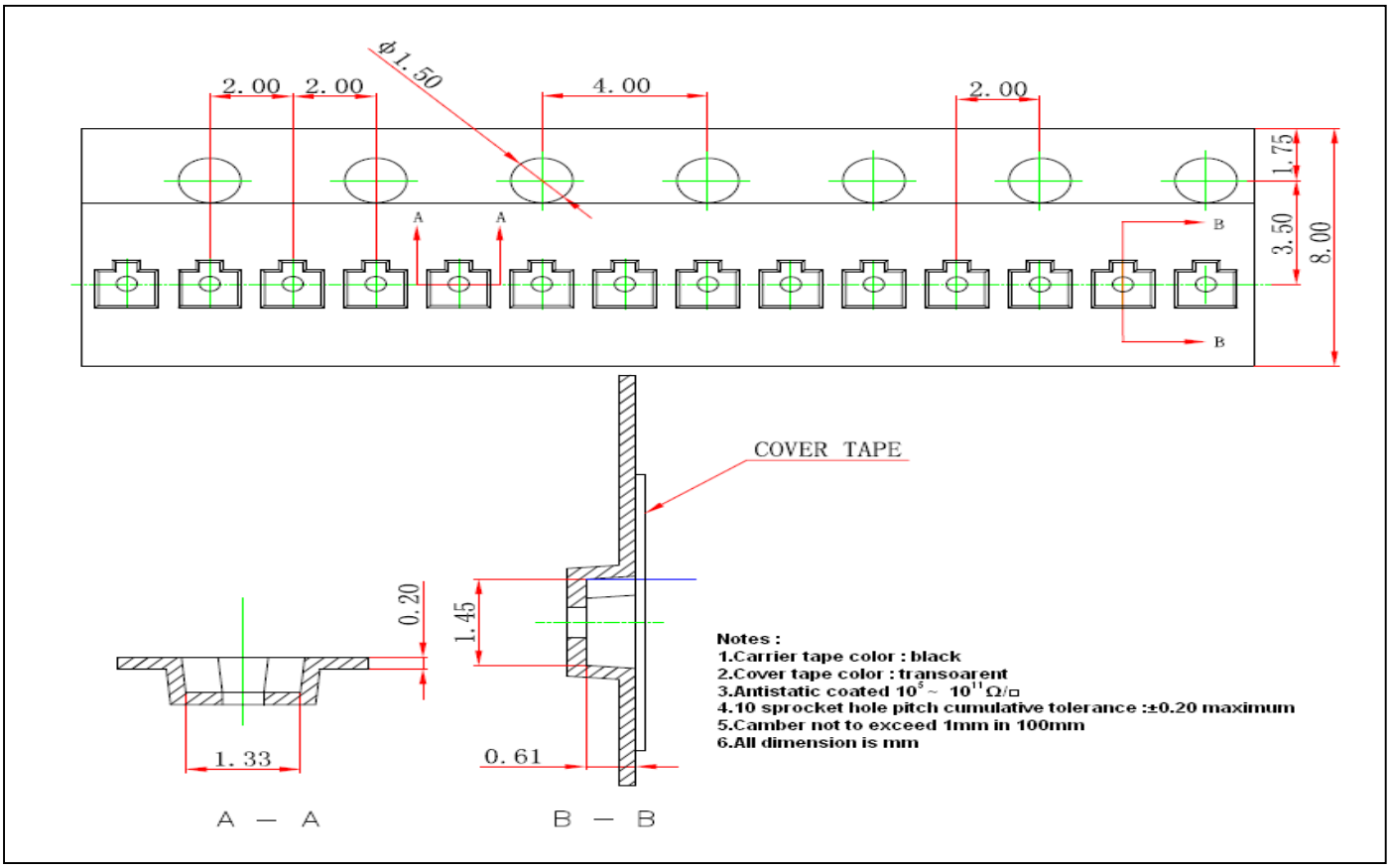
Transient Thermal Response Curves



Reel Dimension



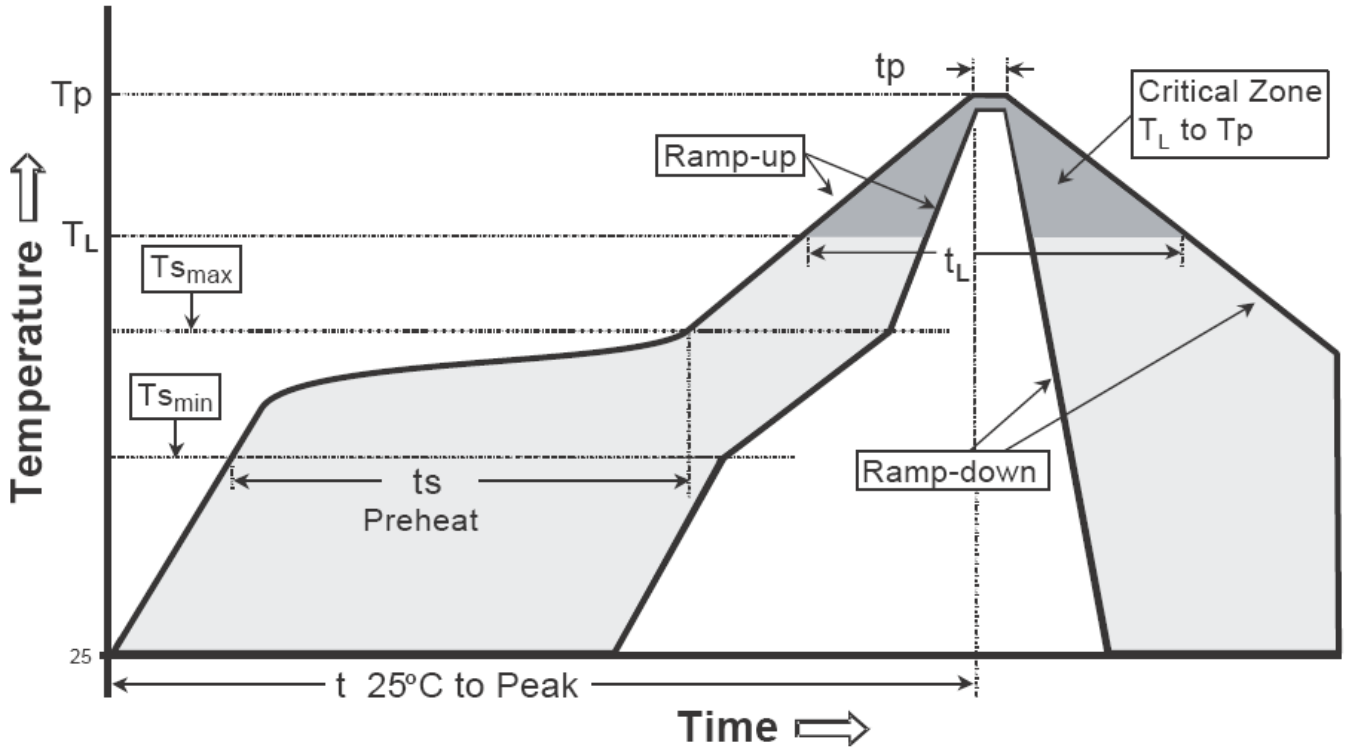
Carrier Tape Dimension



Recommended wave soldering condition

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

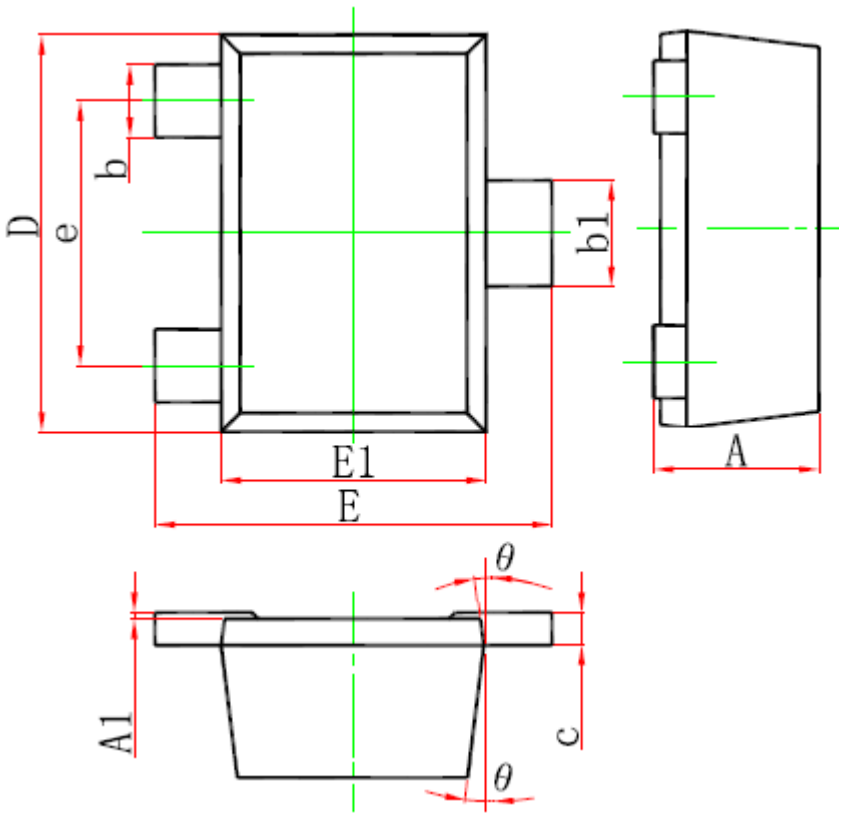
Recommended temperature profile for IR reflow

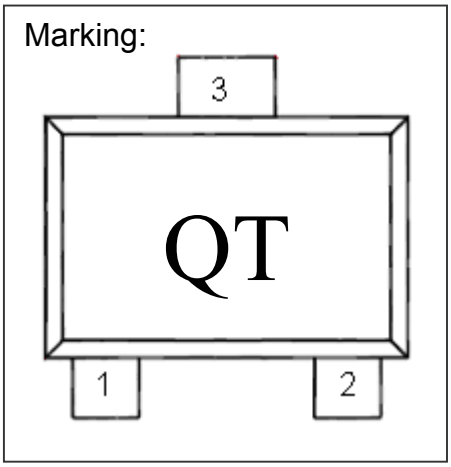


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature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

SOT-723 Dimension





3-Lead SOT-723 Plastic
Surface Mounted Package
CYStek Package Code: Y3

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

*Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.000	0.500	0.000	0.020	D	1.150	1.250	0.045	0.049
A1	0.000	0.050	0.000	0.002	E	1.150	1.250	0.045	0.049
b	0.170	0.270	0.007	0.011	E1	0.750	0.850	0.030	0.033
b1	0.270	0.370	0.011	0.015	e	0.800*		0.031*	
c	0.000	0.150	0.000	0.006	θ	7° REF		7° 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.