20V N-Channel Enhancement Mode MOSFET

MTA340N02KC3

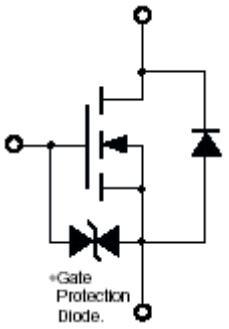
BV_{DSS}	20V
I_D @V_{GS}=4.5V, T_A=25°C	700mA
R_{DSON}@V_{GS}=4.5V, I_D=650mA	299mΩ(typ)
R_{DSON}@V_{GS}=2.5V,I_D=500mA	550mΩ(typ)
R_{DSON}@V_{GS}=1.8V,I_D=200mA	1.05Ω (typ)

Features

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

Symbol

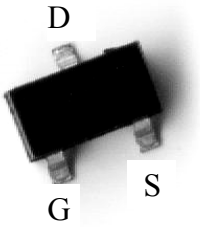
MTA340N02KC3



G：Gate
S：Source
D：Drain

Outline

SOT-523



Ordering Information

Device	Package	Shipping
MTA340N02KC3-0-T1-G	SOT-523 (Pb-free lead plating package)	3000 pcs / tape & reel

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

Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	
Continuous Drain Current @ T_A=25°C, V_{GS}=4.5V	I_D	700 (Note 3)	mA
Continuous Drain Current @ T_A=70°C, V_{GS}=4.5V		560 (Note 3)	
Pulsed Drain Current (Notes 1, 2)	I_{DM}	2.8	A
Power Dissipation	P_D	280 (Note 3)	mW
ESD susceptibility	V_{ESD}	1400 (Note 4)	V
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note 3)	Rth,ja	450	°C/W

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on 1 in² copper pad of FR-4 board.
4. Human body model, 1.5kΩ in series with 100pF.

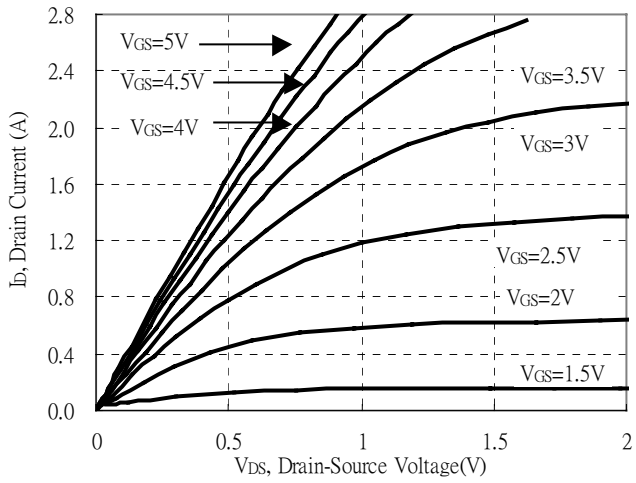
Electrical Characteristics (Tj=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	0.45	0.66	1.0	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±10V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS}=16V, V_{GS}=0V
	-	-	10		V_{DS}=16V, V_{GS}=0V (Tj=70°C)
*$R_{DS(ON)}$	-	299	390	mΩ	V_{GS}=4.5V, I_D=650mA
	-	550	705		V_{GS}=2.5V, I_D=500mA
	-	1.05	2.1	Ω	V_{GS}=1.8V, I_D=200mA
*G_{FS}	-	870	-	mS	V_{DS}=10V, I_D=400mA
Dynamic					
Ciss	-	35	-	pF	V_{DS}=15V, V_{GS}=0, f=1MHz
Coss	-	11	-		
Crss	-	9	-		
$t_{d(ON)}$	-	7	-	ns	V_{DS}=15V, I_D=500mA, V_{GS}=4.5V, R_G=6Ω
t_r	-	21	-		
$t_{d(OFF)}$	-	25	-		
t_f	-	47	-		
Qg	-	1	-	nC	V_{DS}=15V, I_D=500mA, V_{GS}=4.5V
Qgs	-	0.05	-		
Qgd	-	0.4	-		
Source-Drain Diode					
*V_{SD}	-	0.78	1.0	V	V_{GS}=0V, I_S=150mA

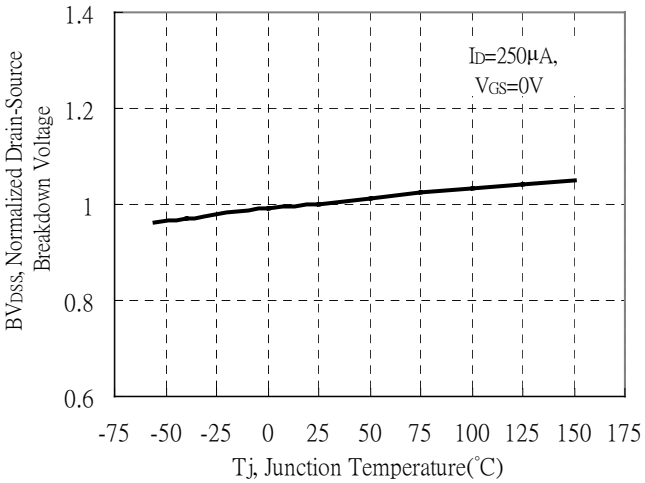
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

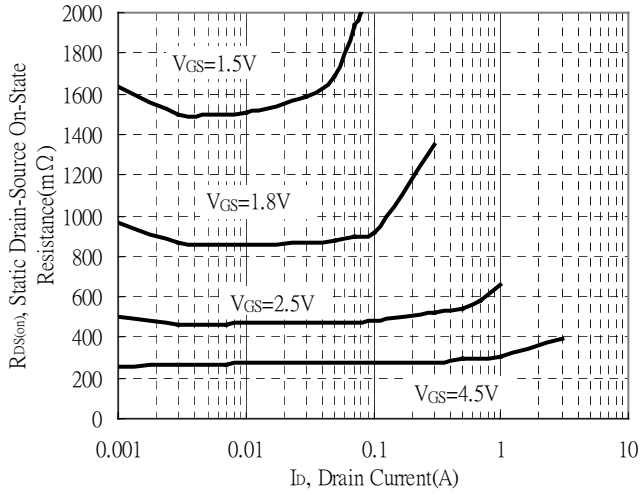
Typical Output Characteristics



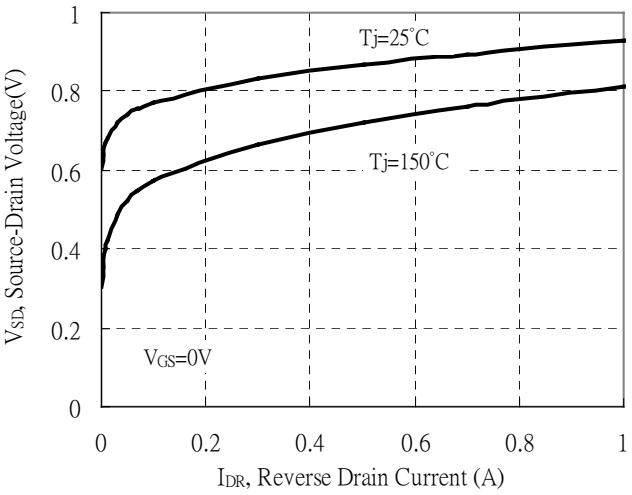
Brekdown Voltage vs Ambient Temperature



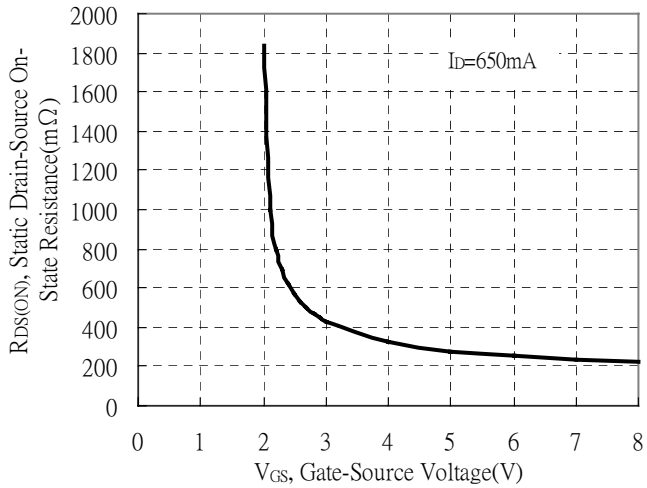
Static Drain-Source On-State resistance vs Drain Current



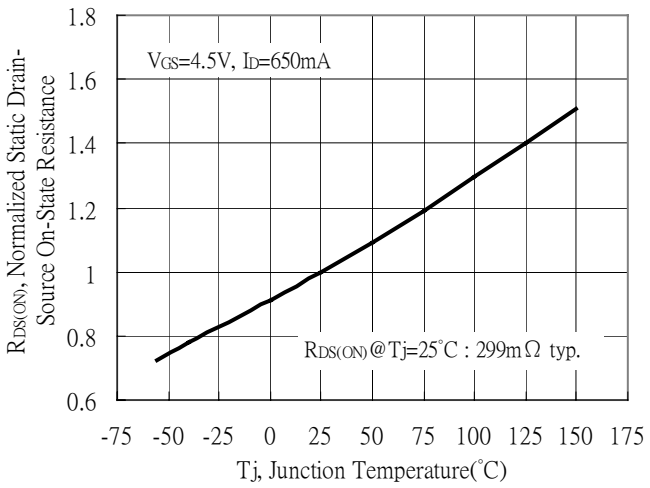
Reverse Drain Current vs Source-Drain Voltage



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

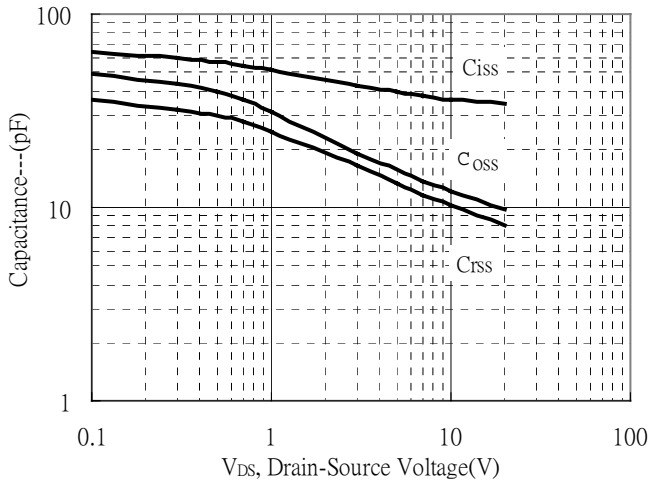


Drain-Source On-State Resistance vs Junction Tempearture

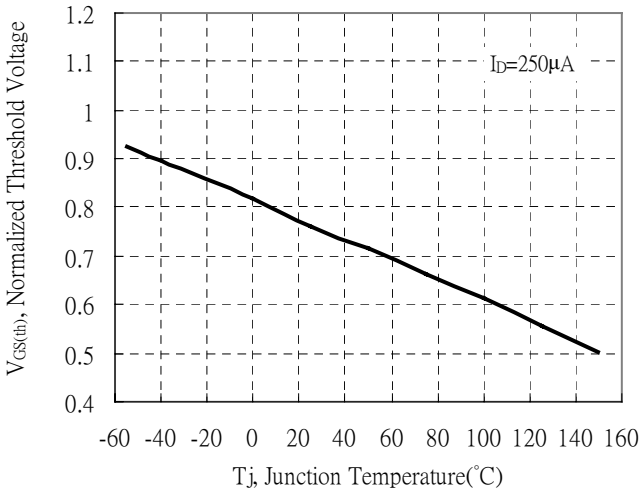


Typical Characteristics(Cont.)

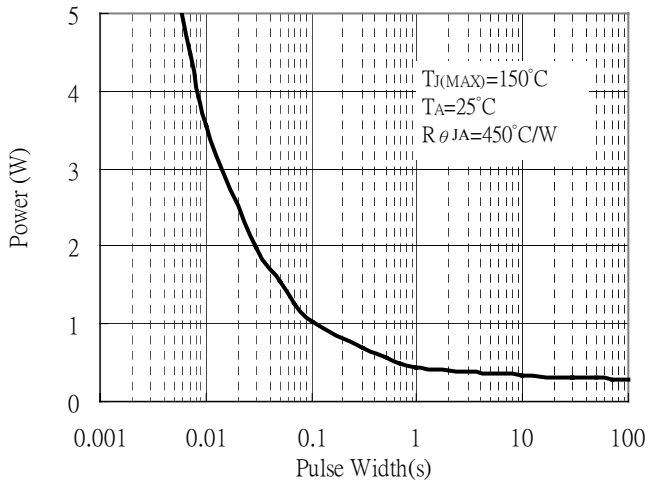
Capacitance vs Drain-to-Source Voltage



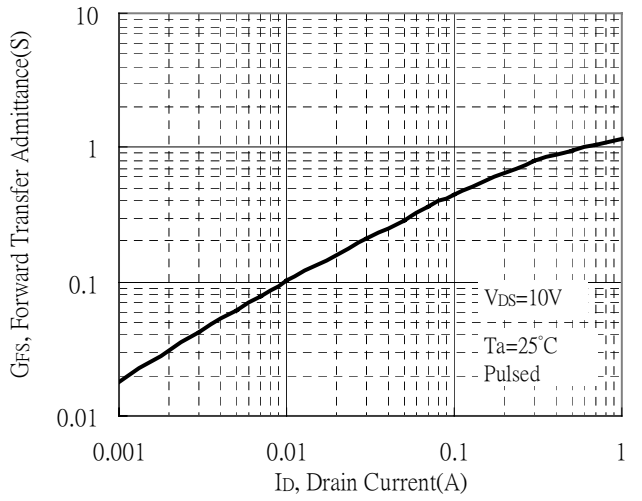
Threshold Voltage vs Junction Tempearture



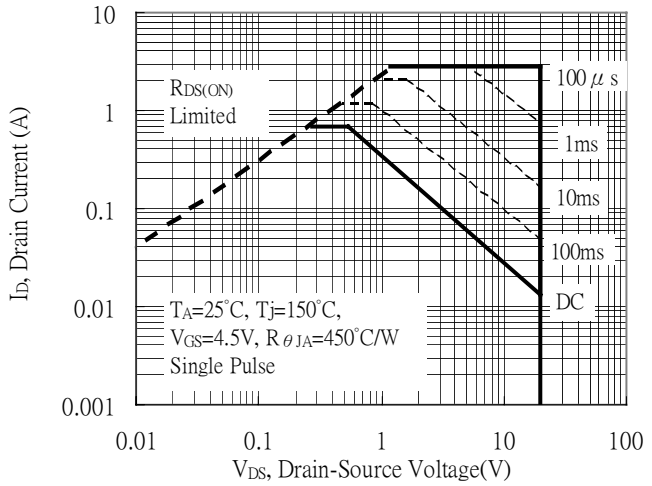
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



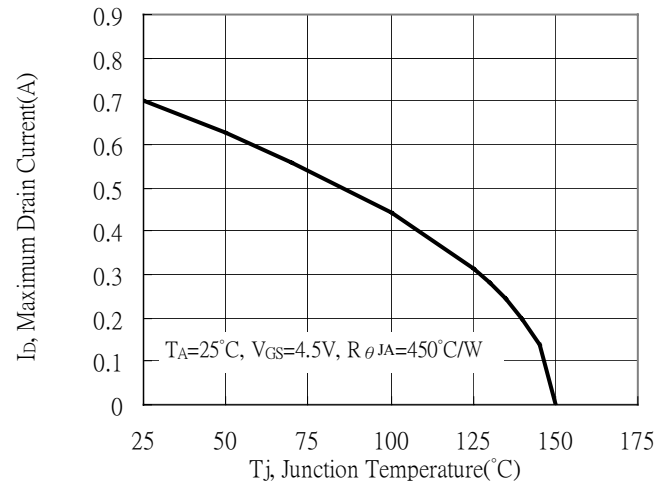
Forward Transfer Admittance vs Drain Current



Maximum Safe Operating Area

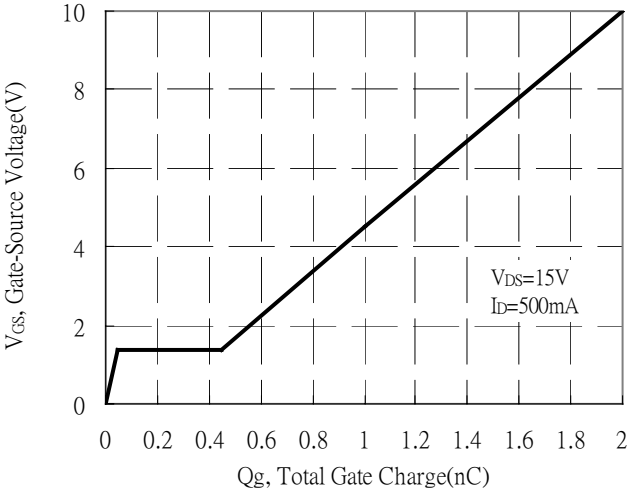


Maximum Drain Current vs JunctionTemperature

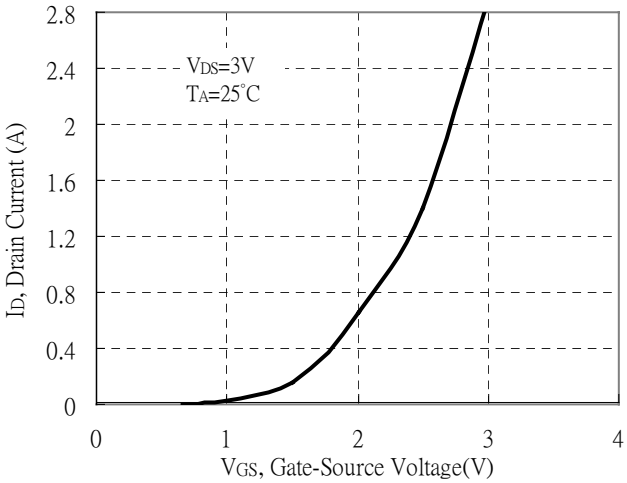


Typical Characteristics(Cont.)

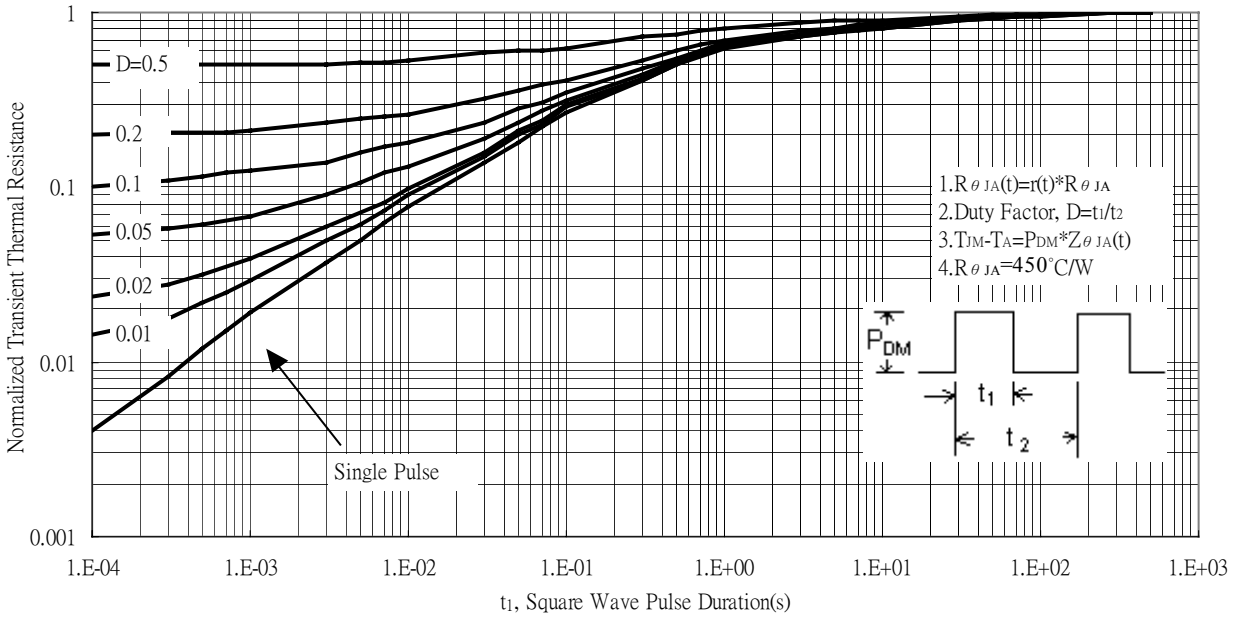
Gate Charge Characteristics



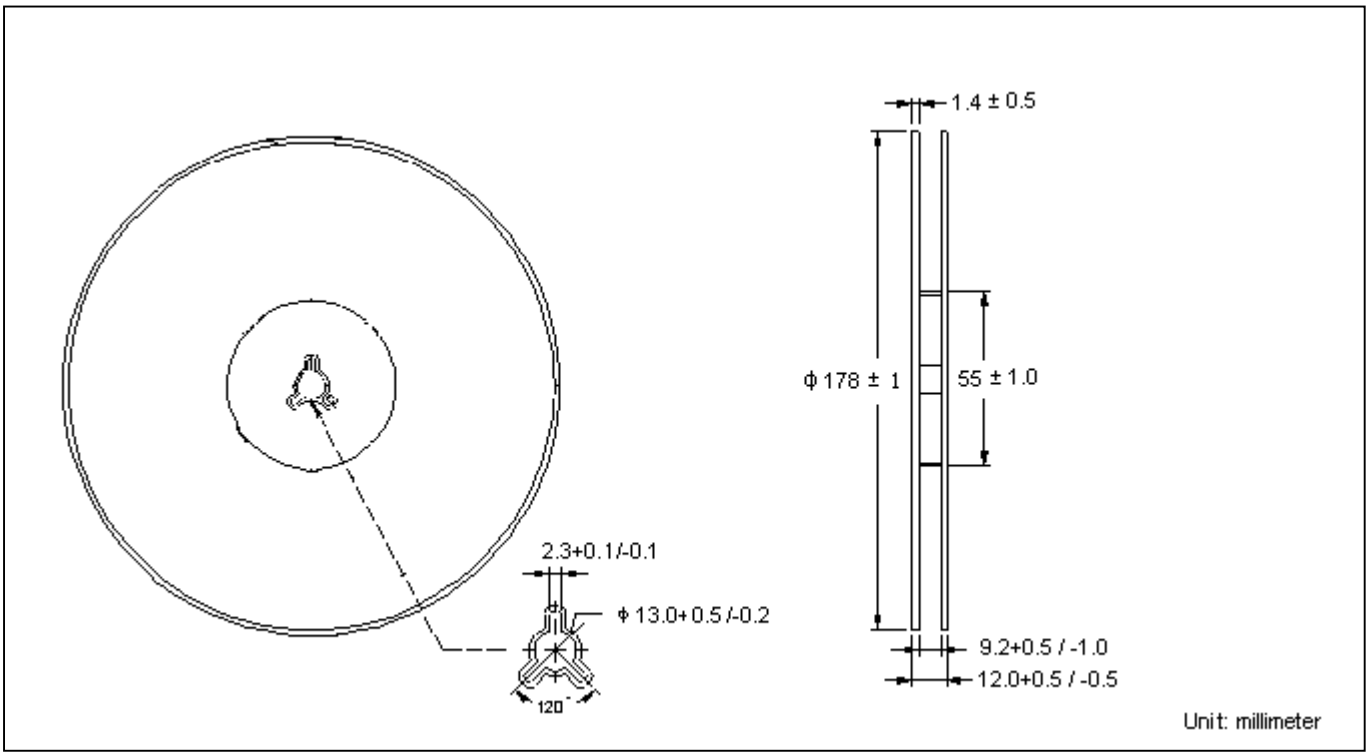
Typical Transfer Characteristics



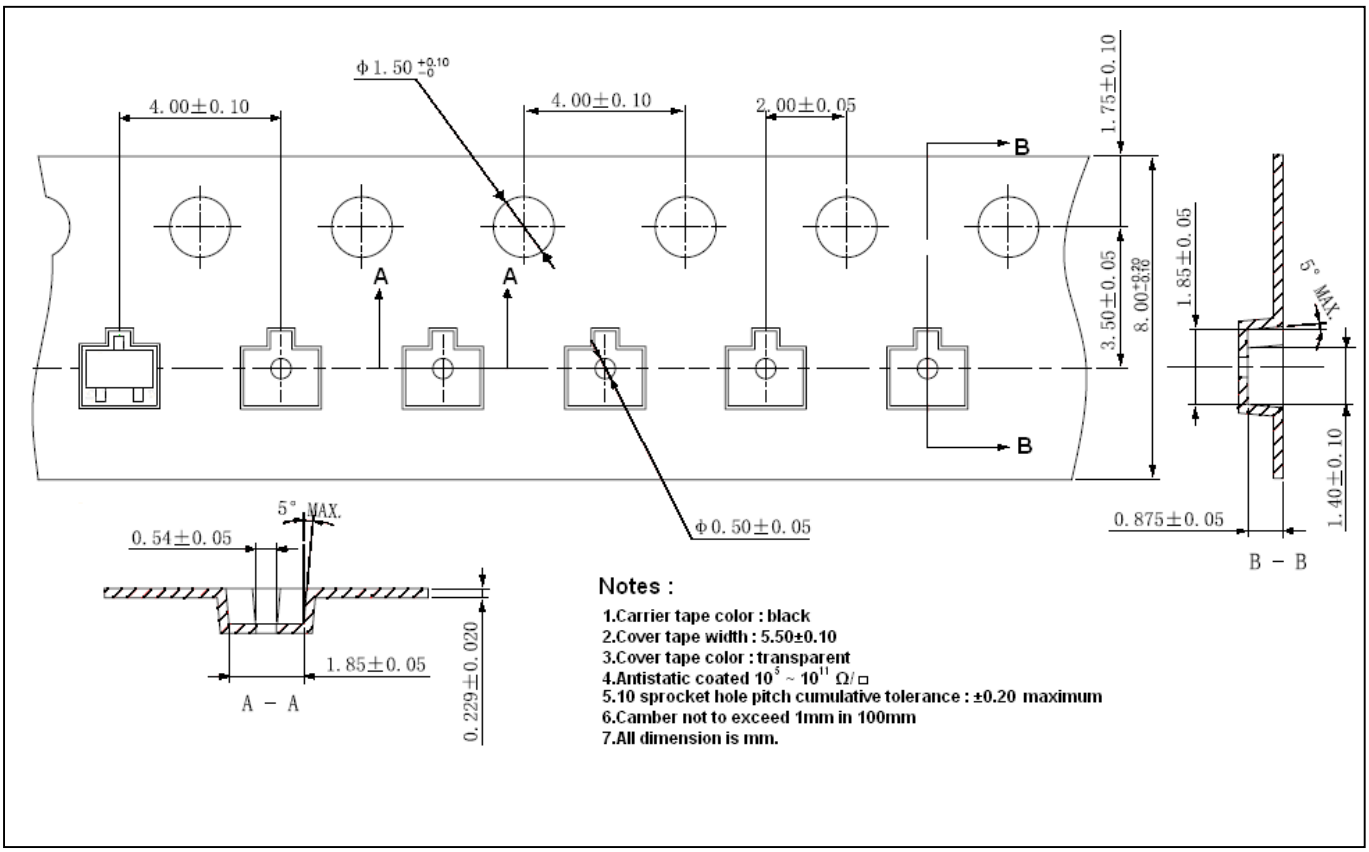
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension



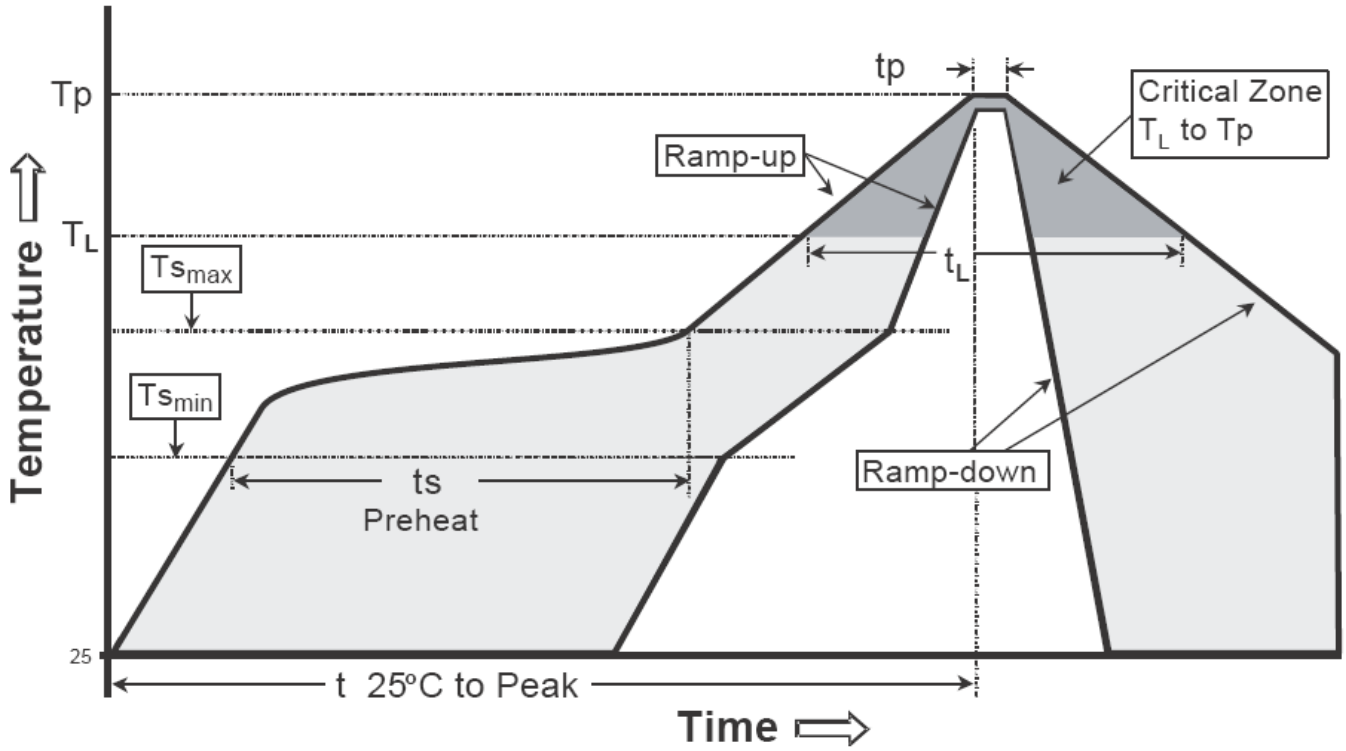
Notes :

1. Carrier tape color : black
2. Cover tape width : 5.50±0.10
3. Cover tape color : transparent
4. Antistatic coated $10^5 \sim 10^{11}$ Ω/□
5. 10 sprocket hole pitch cumulative tolerance : ±0.20 maximum
6. Camber not to exceed 1mm in 100mm
7. All dimension is mm.

Recommended wave soldering condition

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

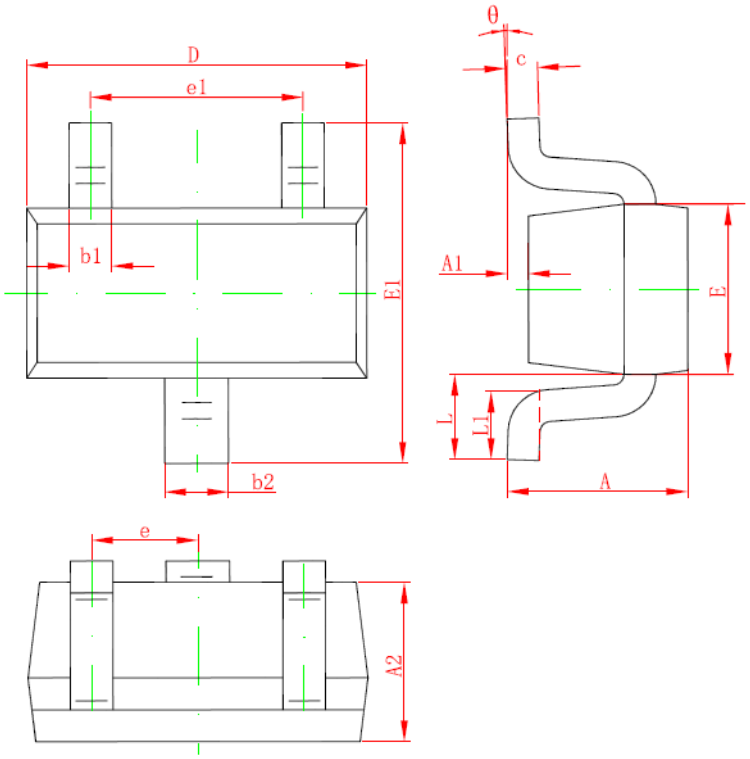
Recommended temperature profile for IR reflow



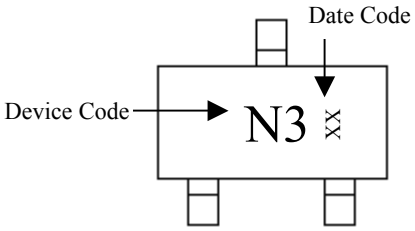
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(TP)	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-523 Dimension



Marking:



3-Lead SOT-523 Plastic
Surface Mounted Package
CYStek Package Code: C3

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

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035	E	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004	E1	1.450	1.750	0.057	0.069
A2	0.700	0.800	0.028	0.031	e	0.500 TYP		0.020 TYP	
b1	0.150	0.250	0.006	0.010	e1	0.900	1.100	0.035	0.043
b2	0.250	0.350	0.010	0.014	L	0.400 REF		0.016 REF	
c	0.100	0.200	0.004	0.008	L1	0.260	0.460	0.010	0.018
D	1.500	1.700	0.059	0.067	θ	0°	8°	0°	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