N-CHANNEL MOSFET (dual transistors)

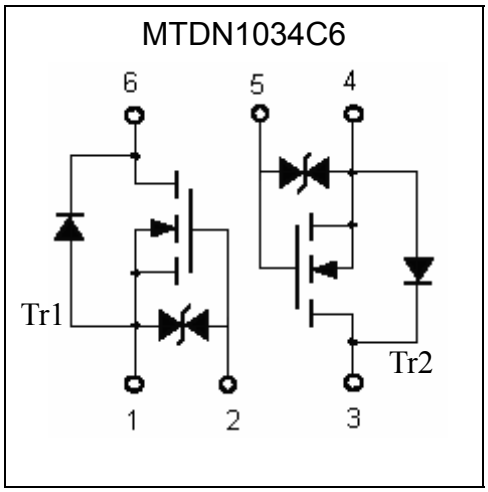
MTDN1034C6

BV_{DSS}		30V
I_D		0.3A
$R_{DSON(TYP)}$	V_{GS}=4.5V, I_D=200mA	0.85Ω
	V_{GS}=2.5V, I_D=175mA	1.23Ω
	V_{GS}=1.8V, I_D=150mA	1.8Ω
	V_{GS}=1.5V, I_D=40mA	2.3Ω

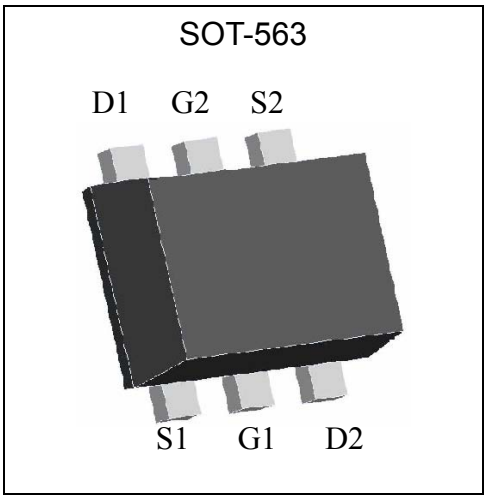
Features

- High speed switching
- Low-voltage drive(1.5V)
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free package

Equivalent Circuit



Outline



The following characteristics apply to both Tr1 and Tr2

Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±8	V
Continuous Drain Current @ V_{GS}=4.5V, T_A=25°C	I_D	0.3	A
Continuous Drain Current @ V_{GS}=4.5V, T_A=85°C		0.22	
Pulsed Drain Current	I_{DM}	1.6 (Note 1)	
Power Dissipation	Pd	150 (Note 2)	mW
Operating Junction Temperature Range	Tj	-55~+150	°C
Storage Temperature Range	Tstg	-55~+150	°C

Note : 1. Pulse test, pulse width≤300μs, duty≤2%
2. 120mW per element must not be exceeded.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}*	30	-	-	V	V_{GS}=0, I_D=10μA
$V_{GS(th)}$	0.5	0.78	1.1	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±1	μA	V_{GS}=±8V, V_{DS}=0
I_{DSS}	-	-	100	nA	V_{DS}=30V, V_{GS}=0
$R_{DS(ON)}$*	-	0.85	1.5	Ω	V_{GS}=4.5V, I_D=200mA
	-	1.23	3		V_{GS}=2.5V, I_D=175mA
	-	1.8	4		V_{GS}=1.8V, I_D=150mA
	-	2.3	5		V_{GS}=1.5V, I_D=40mA
G_{FS}	-	460	-	mS	V_{DS}=10V, I_D=200mA
Dynamic					
C_{iss}	-	33.5	-	pF	V_{DS}=15V, V_{GS}=0, f=1MHz
C_{oss}	-	6.1	-		
C_{rss}	-	2.5	-		
Qg	-	495	-	pC	V_{DS}=15V, I_D=300mA, V_{GS}=4.5V
Qgs	-	49	-		
Qgd	-	175	-		
$t_{d(on)}$	-	-	50	ns	V_{DD}=15V, I_D=200mA, V_{GS}=4.5V, R_G=10Ω
t_r	-	-	25		
$t_{d(off)}$	-	-	50		
t_f	-	-	25		
Source-Drain Diode					
I_S	-	-	0.3	A	
I_{SM}	-	-	2		
V_{SD}	-	0.81	1	V	I_S=150mA, V_{GS}=0V

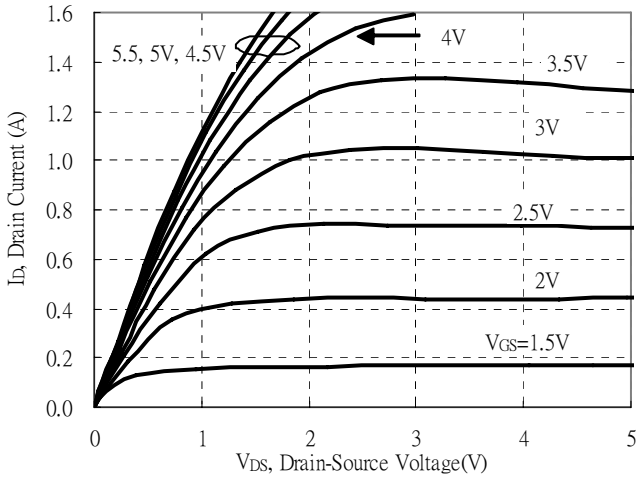
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

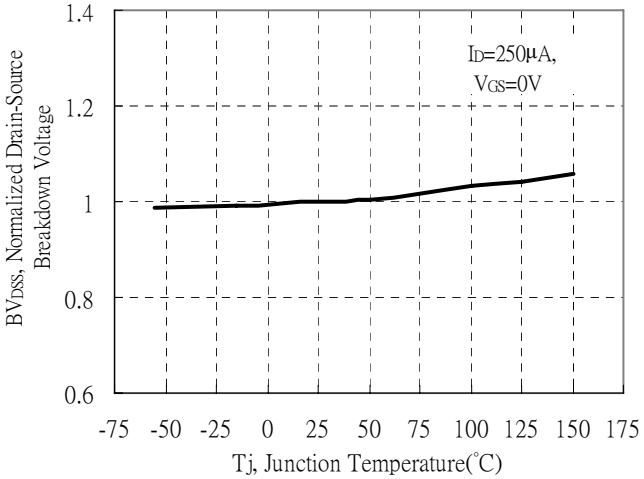
Device	Package	Shipping	Marking
MTDN1034C6	SOT-563 (Pb-free and halogen-free package)	3000 pcs / Tape & Reel	KL

Typical Characteristics

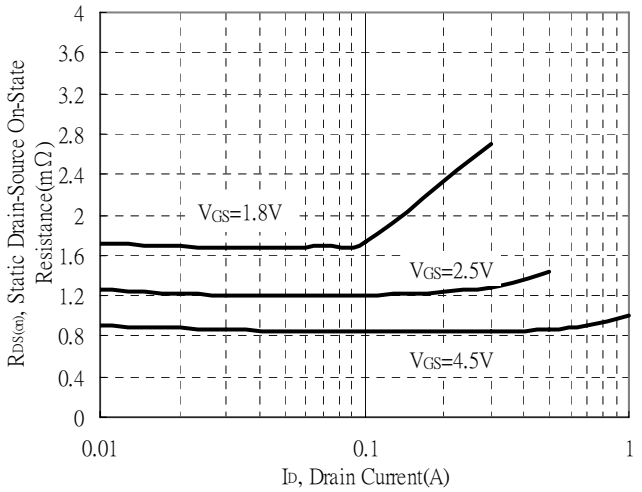
Typical Output Characteristics



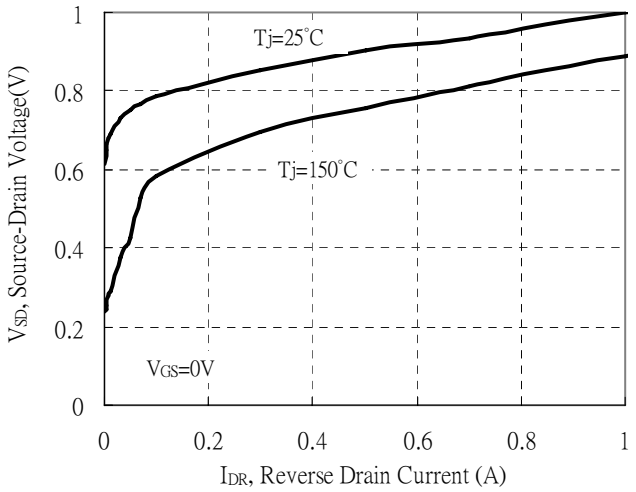
Brekdown Voltage vs Ambient Temperature



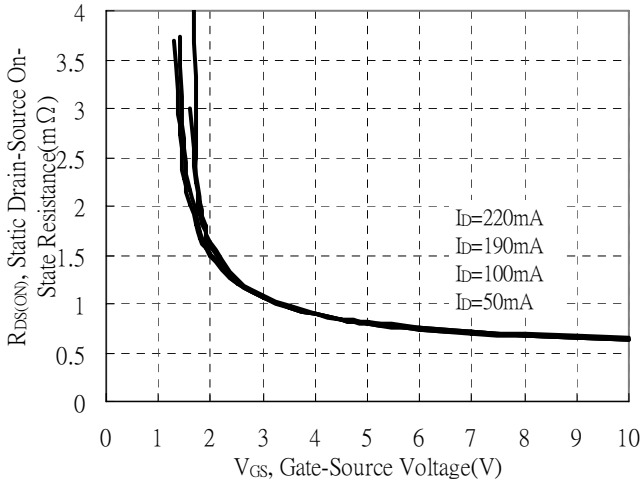
Static Drain-Source On-State resistance vs Drain Current



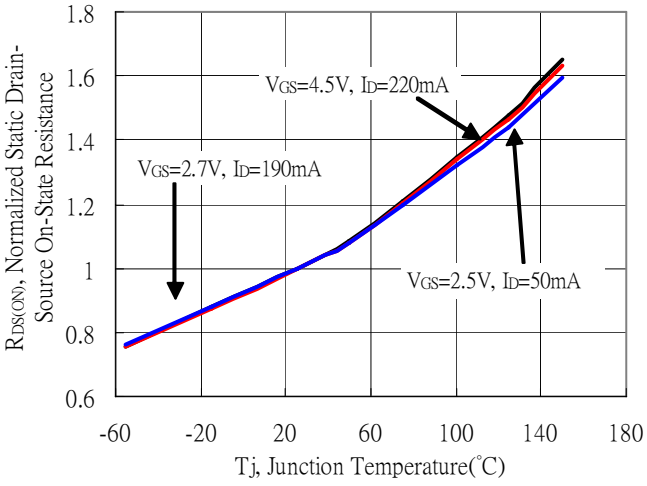
Reverse Drain Current vs Source-Drain Voltage



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

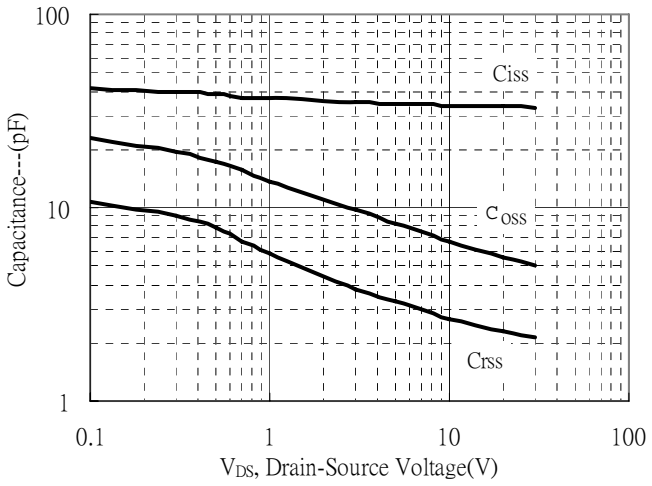


Drain-Source On-State Resistance vs Junction Tempearture

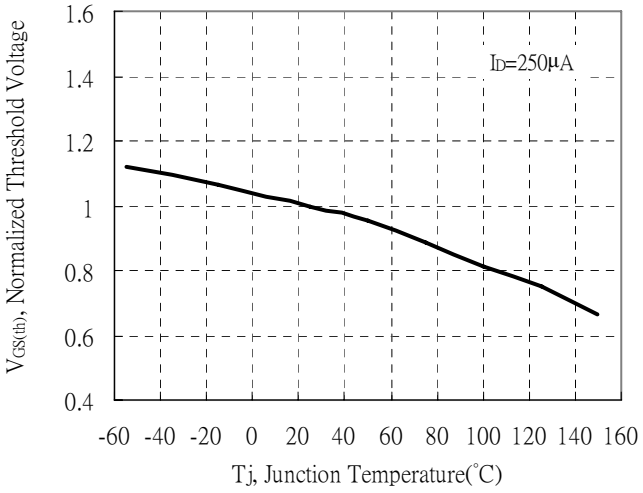


Typical Characteristics(Cont.)

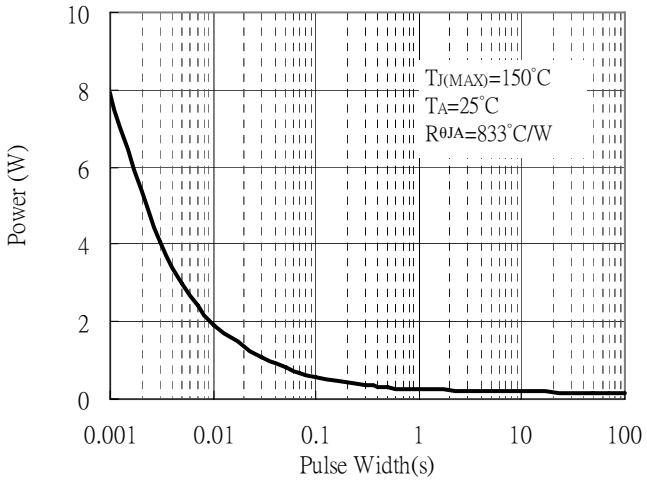
Capacitance vs Drain-to-Source Voltage



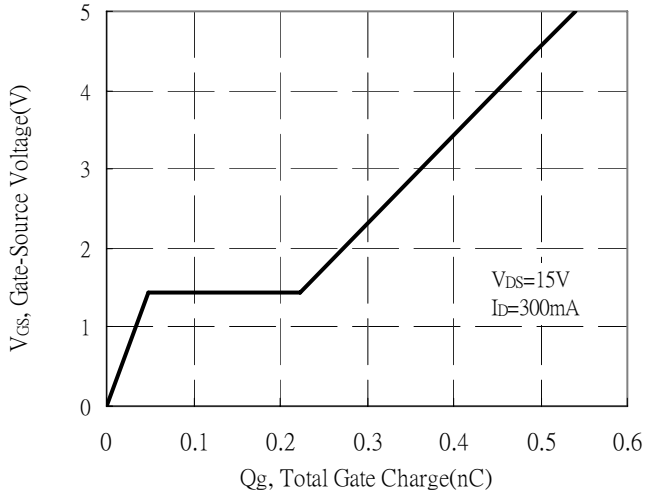
Threshold Voltage vs Junction Tempearture



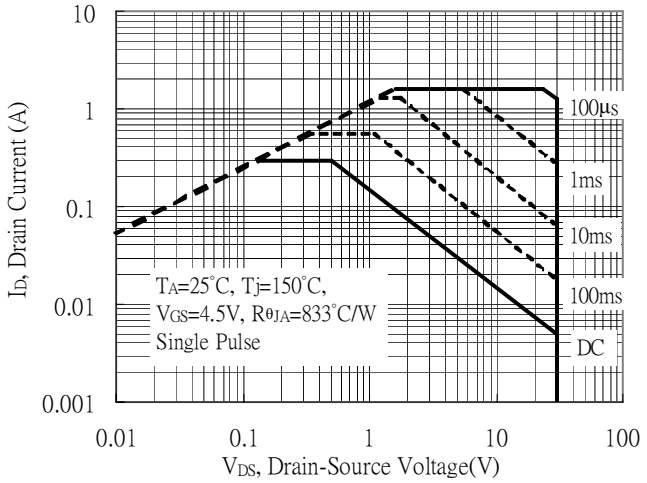
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



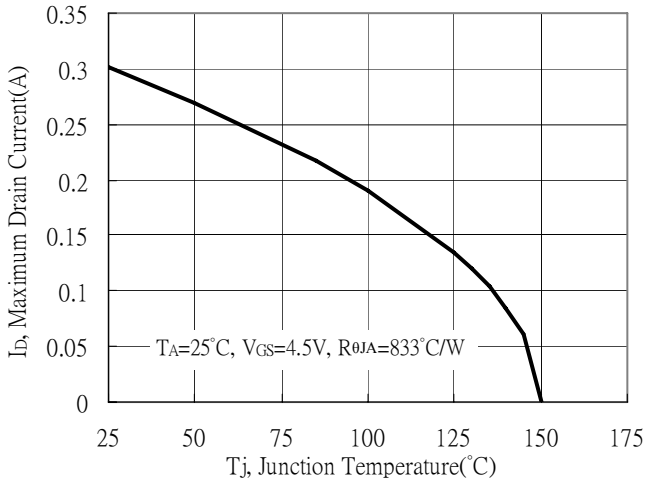
Gate Charge Characteristics



Maximum Safe Operating Area

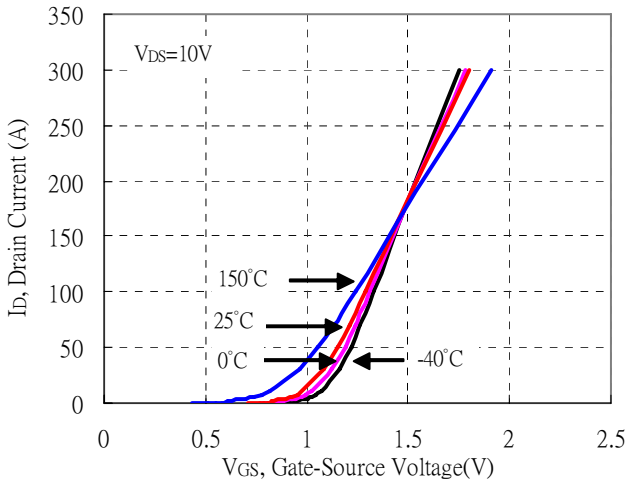


Maximum Drain Current vs JunctionTemperature

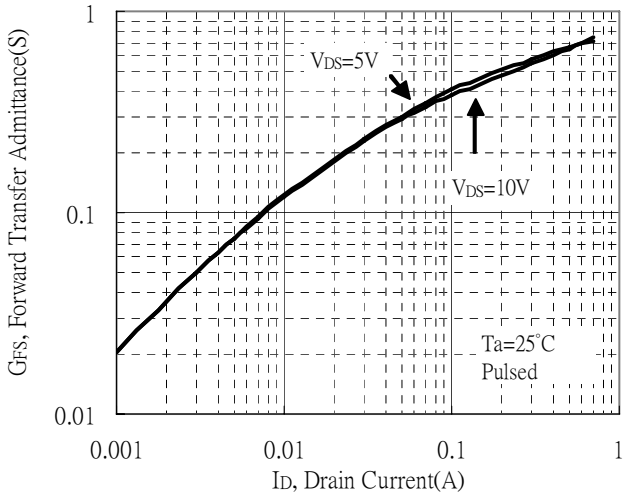


Typical Characteristics(Cont.)

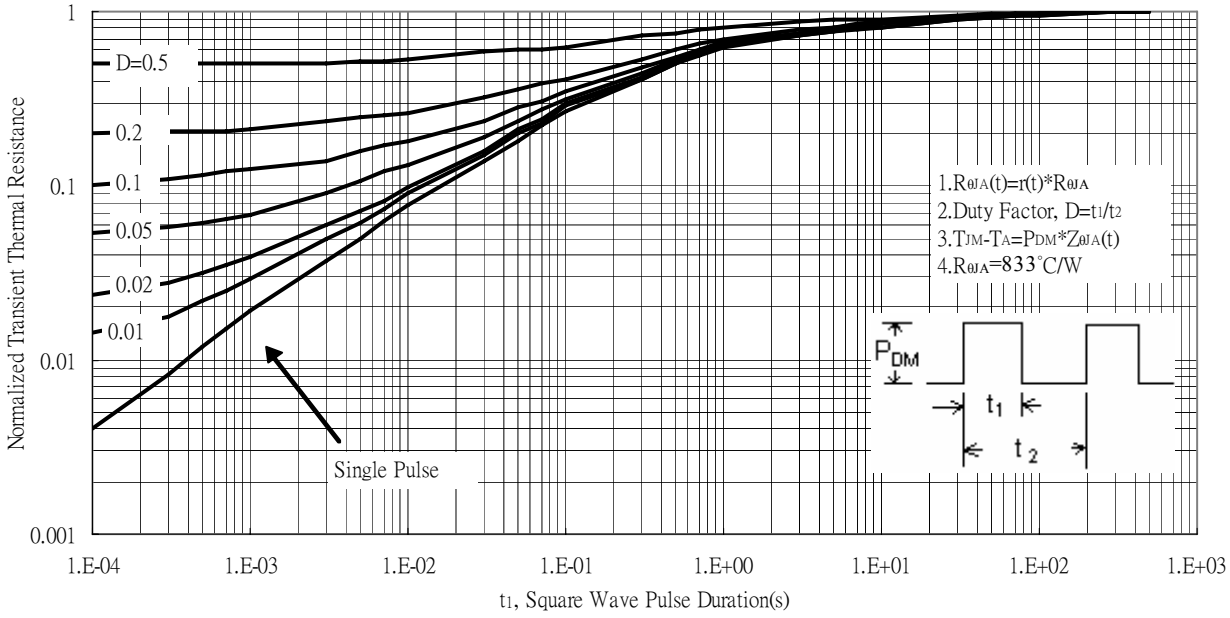
Typical Transfer Characteristics



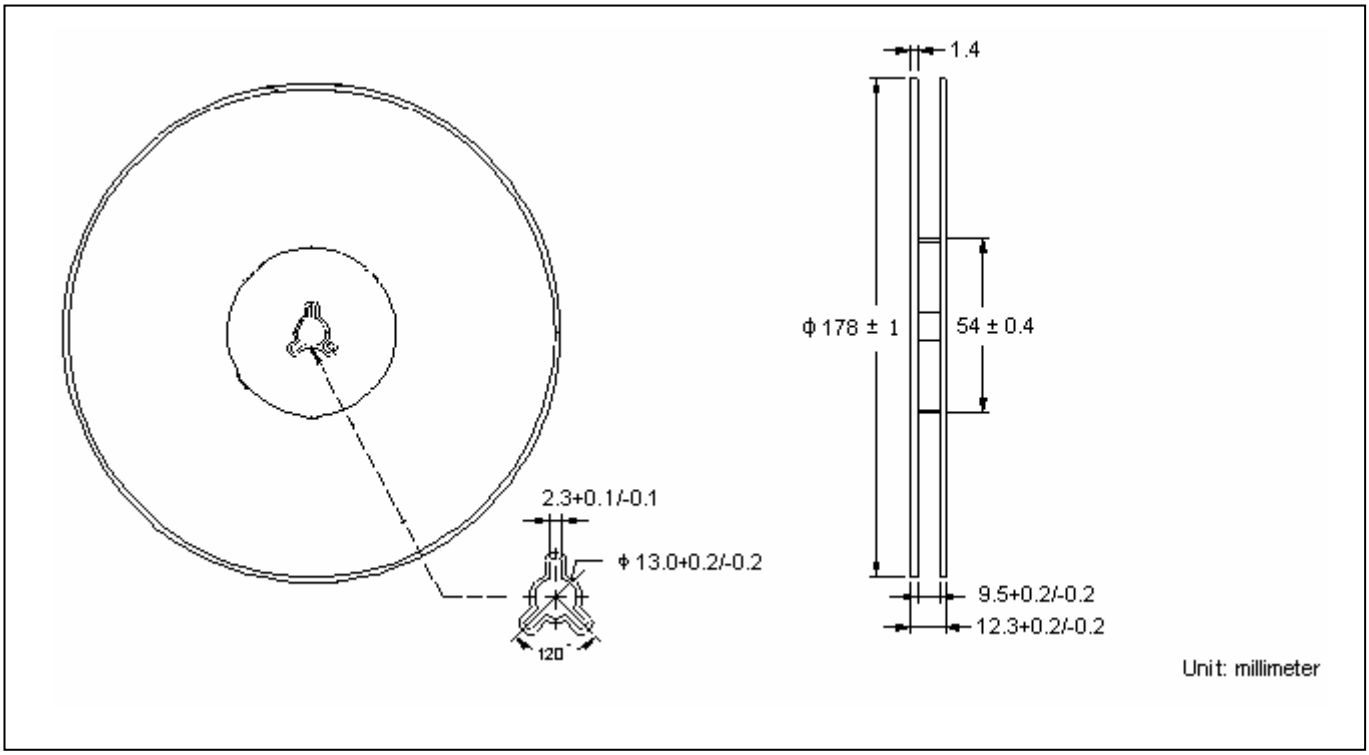
Forward Transfer Admittance vs Drain Current



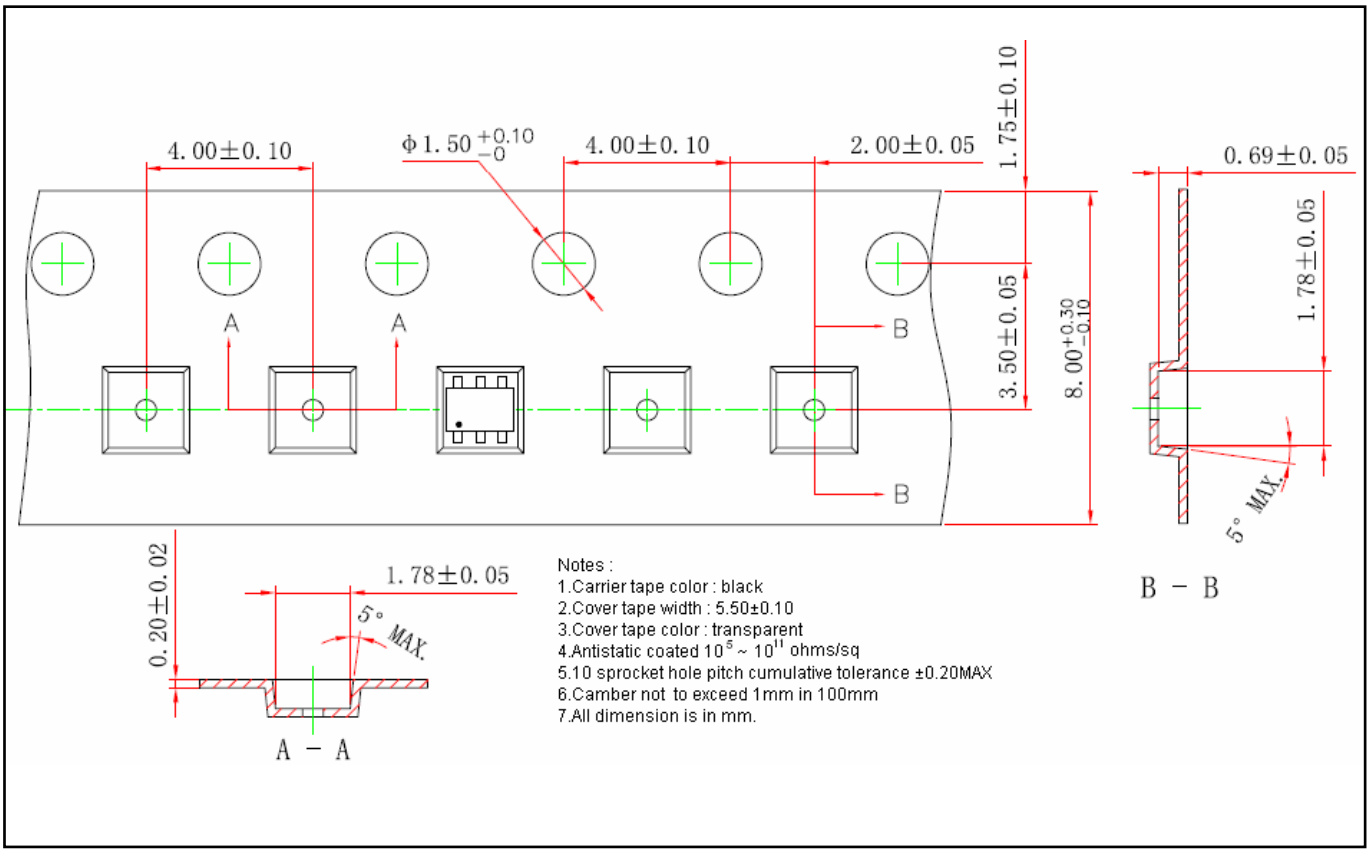
Transient Thermal Response Curves



Reel Dimension



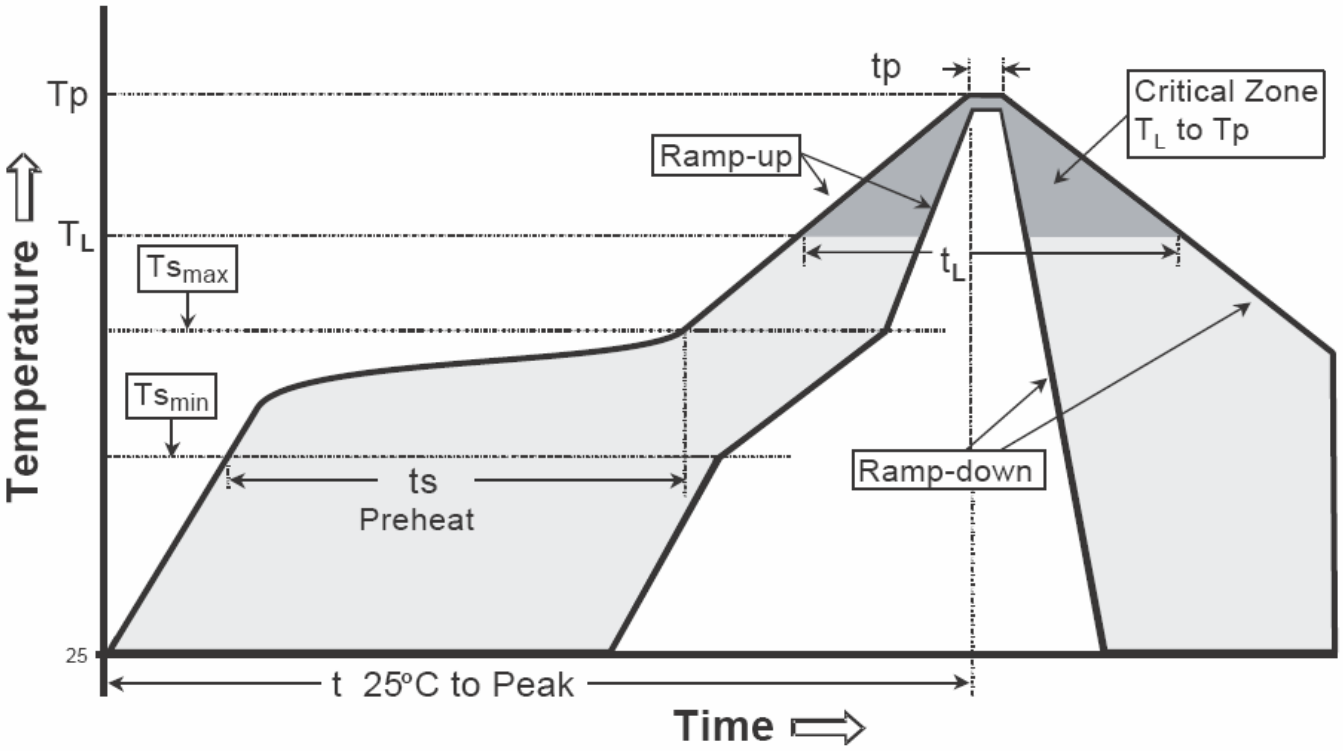
Carrier Tape Dimension



Recommended wave soldering condition

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

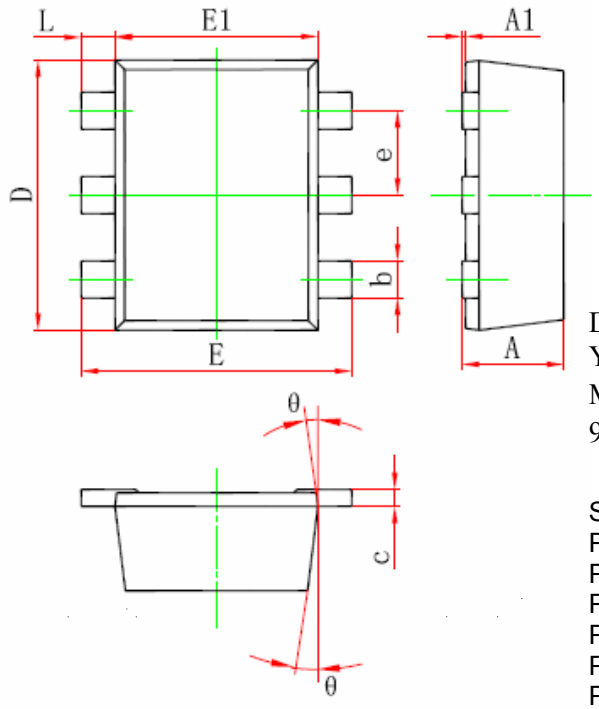
Recommended temperature profile for IR reflow



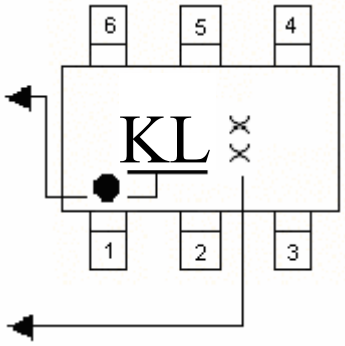
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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-563 Dimension



Marking:



Product Code

Date Code: Year+Month
Year: 6→2006, 7→2007
Month: 1→1, 2→2, • • •
9→9, A→10, B→11, C→12

Style:
Pin 1. Source1 (S1)
Pin 2. Gate1 (G1)
Pin 3. Drain2 (D2)
Pin 4. Source2 (S2)
Pin 5. Gate2 (G2)
Pin 6. Drain1 (D1)

6-Lead SOT-563 Plastic
Surface Mounted Package
CYStek Package Code: C6

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.021	0.024	0.525	0.600	b	0.007	0.011	0.170	0.270
A1	0.000	0.002	0.000	0.050	E1	0.043	0.051	1.100	1.300
e	0.018	0.022	0.450	0.550	E	0.059	0.067	1.500	1.700
c	0.004	0.006	0.090	0.160	L	0.004	0.012	0.100	0.300
D	0.059	0.067	1.500	1.700	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.

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek ***semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.***
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.