

ESD protected Dual N-CHANNEL MOSFET

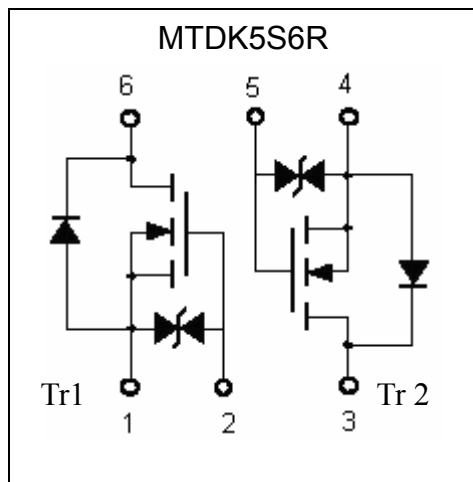
MTDK5S6R

BV _{DSS}		30V
I _D		250mA
R _{DS(on)(TYP)}	V _{GS} =4V, I _D =10mA	1.3 Ω
	V _{GS} =2.5V, I _D =1mA	2.7 Ω

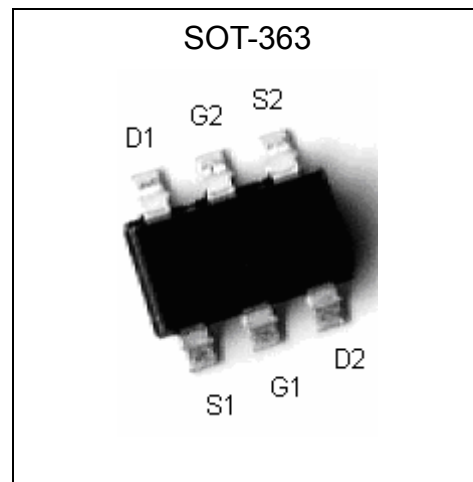
Description

- Low voltage drive(2.5V drive) makes this device ideal for portable equipment.
- The MOSFET elements are independent, eliminating mutual interference.
- Mounting cost and area can be cut in half.
- High speed switching
- ESD protected device
- Pb-free lead plating & halogen-free package

Symbol



Outline



The following characteristics apply to both Tr1 and Tr2

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	BV _{DSS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	±250	mA
Pulsed Drain Current (Ta=25°C)	I _{DM}	±800 *1	mA
Total Power Dissipation	P _D	200 *2	mW
ESD susceptibility		1550 *3	V
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	R _{th,ja}	625	°C/W

Note : *1. Pulse Width ≤ 10μs, Duty cycle ≤ 1%
 *2. With each pin mounted on the recommended lands.
 *3. Human body model, 1.5kΩ in series with 100pF



Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Channel-to-ambient, max	*R _{th,ch-a}	625 (total)	°C/W
		800 (per element)	

Note : With each pin mounted on the recommended lands.

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
B _V D _{SS}	30	-	-	V	V _{GS} =0, I _D =100μA
V _{GS(th)}	0.8	1.2	1.5	V	V _{DS} =3V, I _D =100μA
I _{GSS}	-	-	±5	μA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	100	nA	V _{DS} =30V, V _{GS} =0
R _D S(ON)	-	1.3	3	Ω	V _{GS} =4V, I _D =10mA
	-	2.7	5		V _{GS} =2.5V, I _D =1mA
G _F S	20	70	-	mS	V _{DS} =3V, I _D =10mA
Dynamic					
C _{iss}	-	31.5	-	pF	V _{DS} =5V, V _{GS} =0, f=1MHz
C _{oss}	-	7.3	-		
C _{rss}	-	5.5	-		
t _{d(on)}	-	11	-	ns	V _{DD} ≐5V, I _D =10mA, V _{GS} =5V, R _L =500Ω, R _G =10Ω
t _r	-	6	-		
t _{d(off)}	-	42	-		
t _f	-	16	-		
Q _g	-	0.66	-	nC	I _D =10mA, V _{DS} =15V, V _{GS} =4V
Q _{gs}	-	0.05	-		
Q _{gd}	-	0.25	-		
Source-Drain Diode					
*V _{SD}	-	0.8	1.2	V	V _{GS} =0V, I _S =100mA

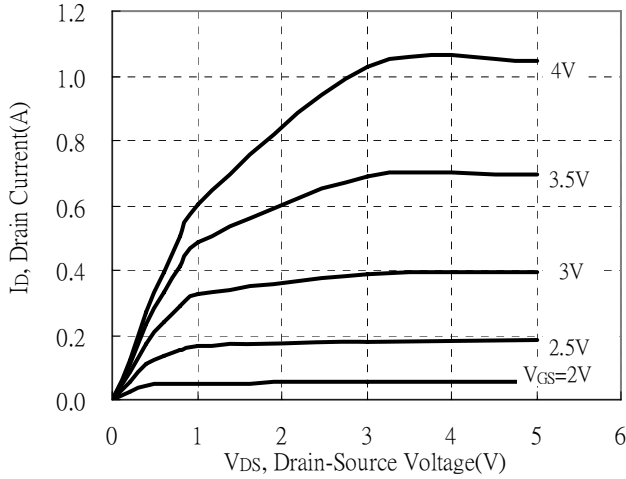
*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%

Ordering Information

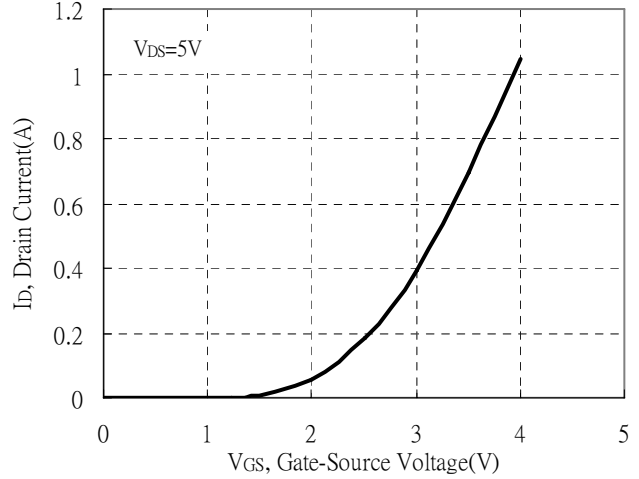
Device	Package	Shipping
MTDK5S6R-0-T1-G	SOT-363 (Pb-free lead plating & halogen-free package)	3000 pcs / Tape & Reel

Typical Characteristics

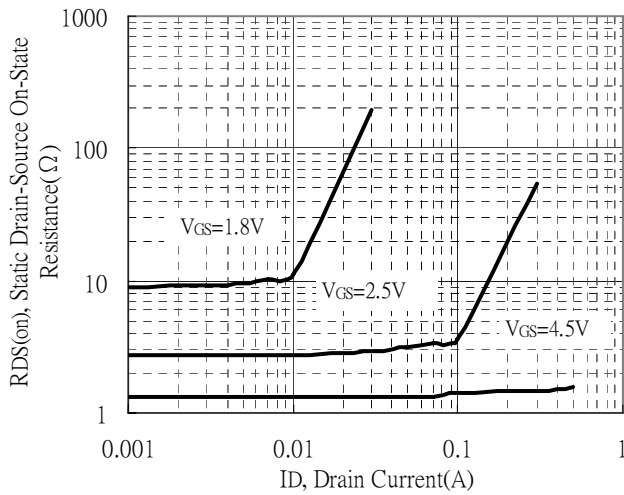
Typical Output Characteristics



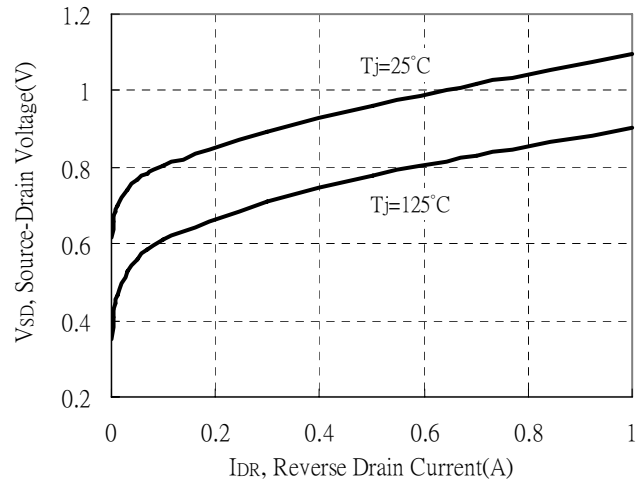
Typical Transfer Characteristics



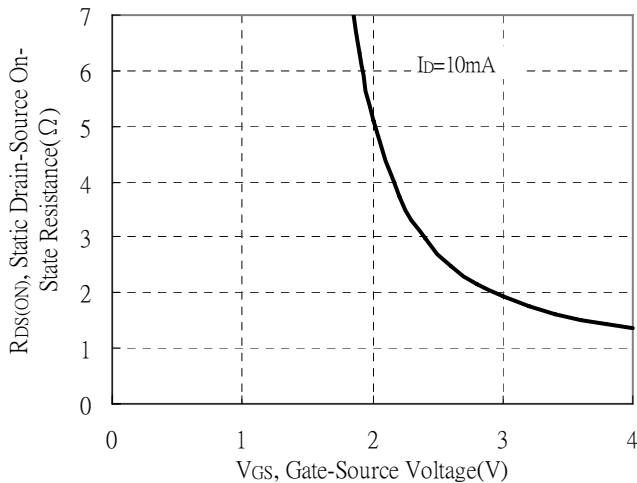
Static Drain-Source On-State resistance vs Drain Current



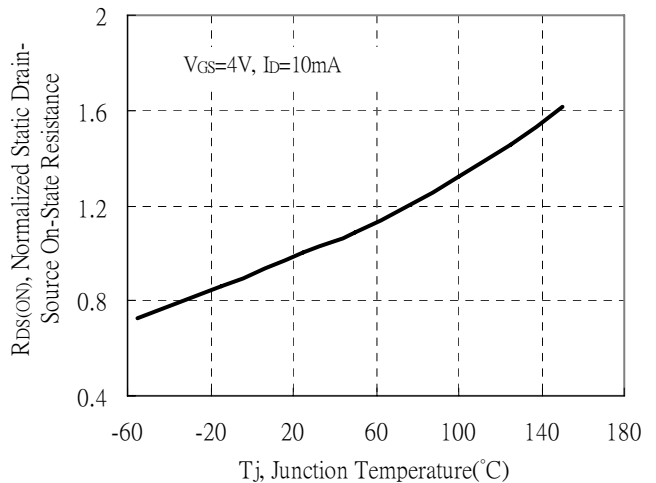
Reverse Drain Current vs Source-Drain Voltage



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

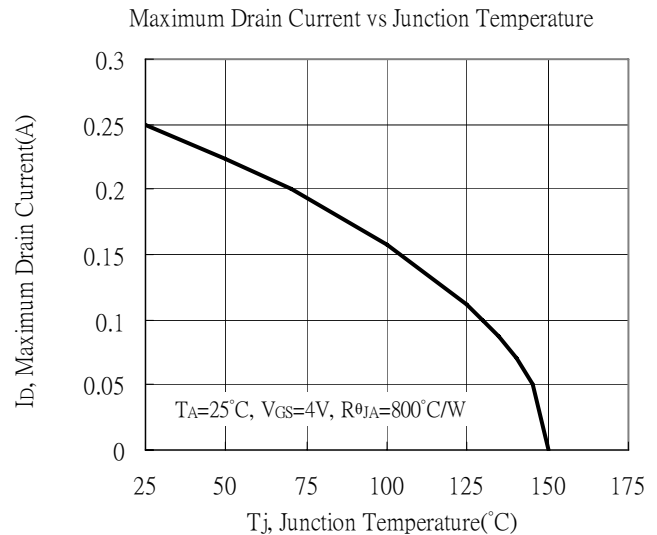
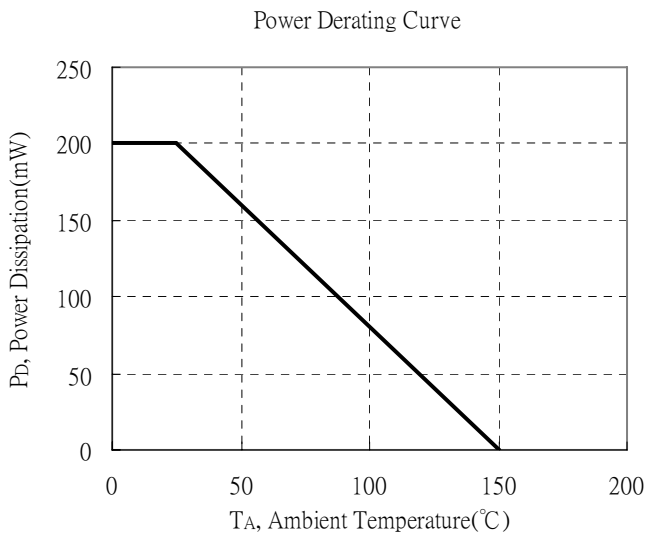
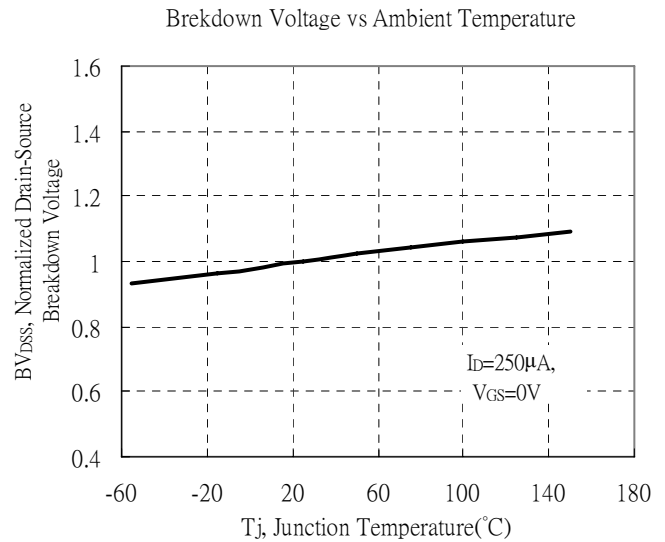
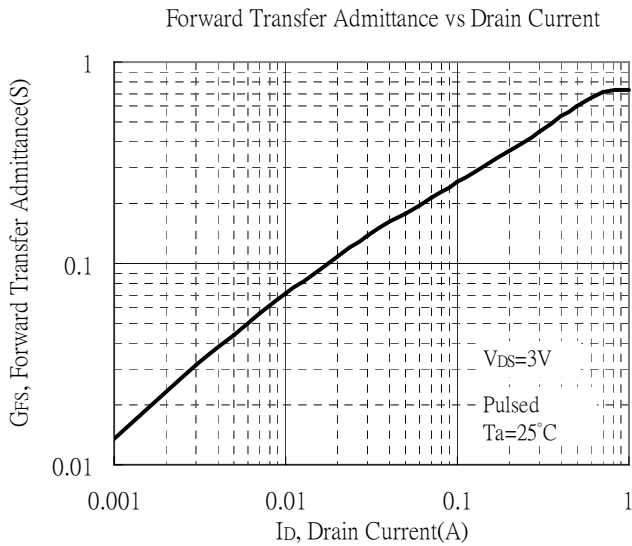
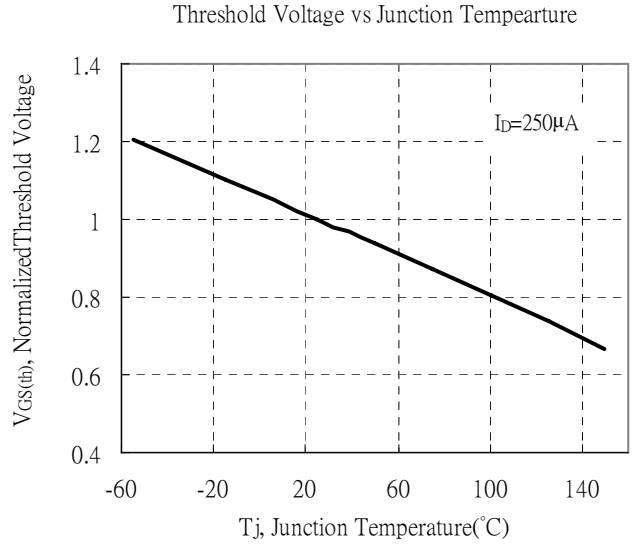
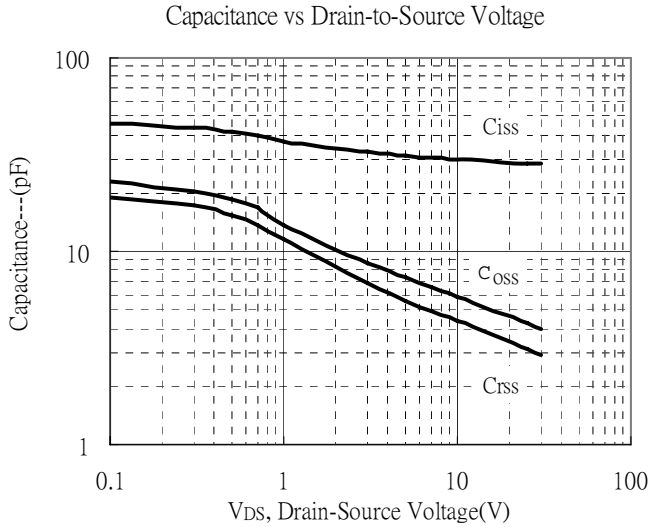


Drain-Source On-State Resistance vs Junction Temperature

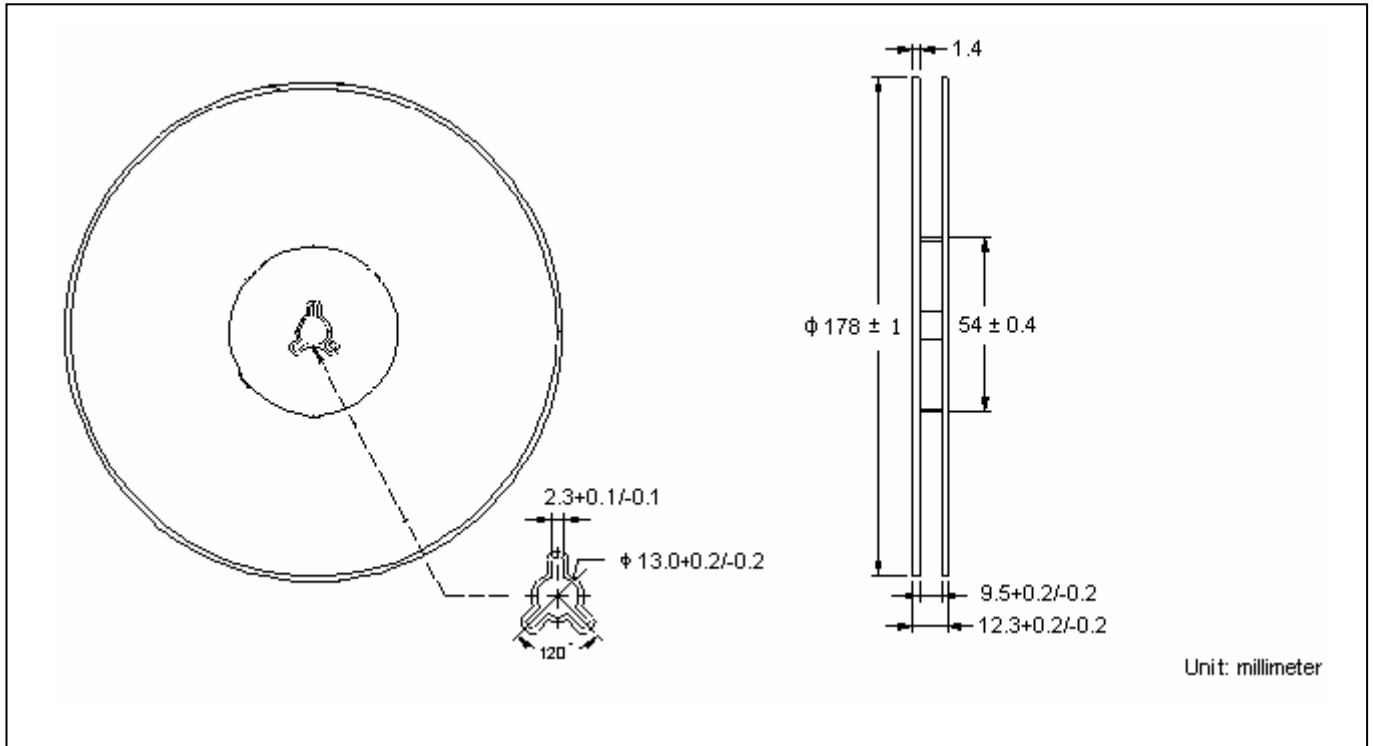




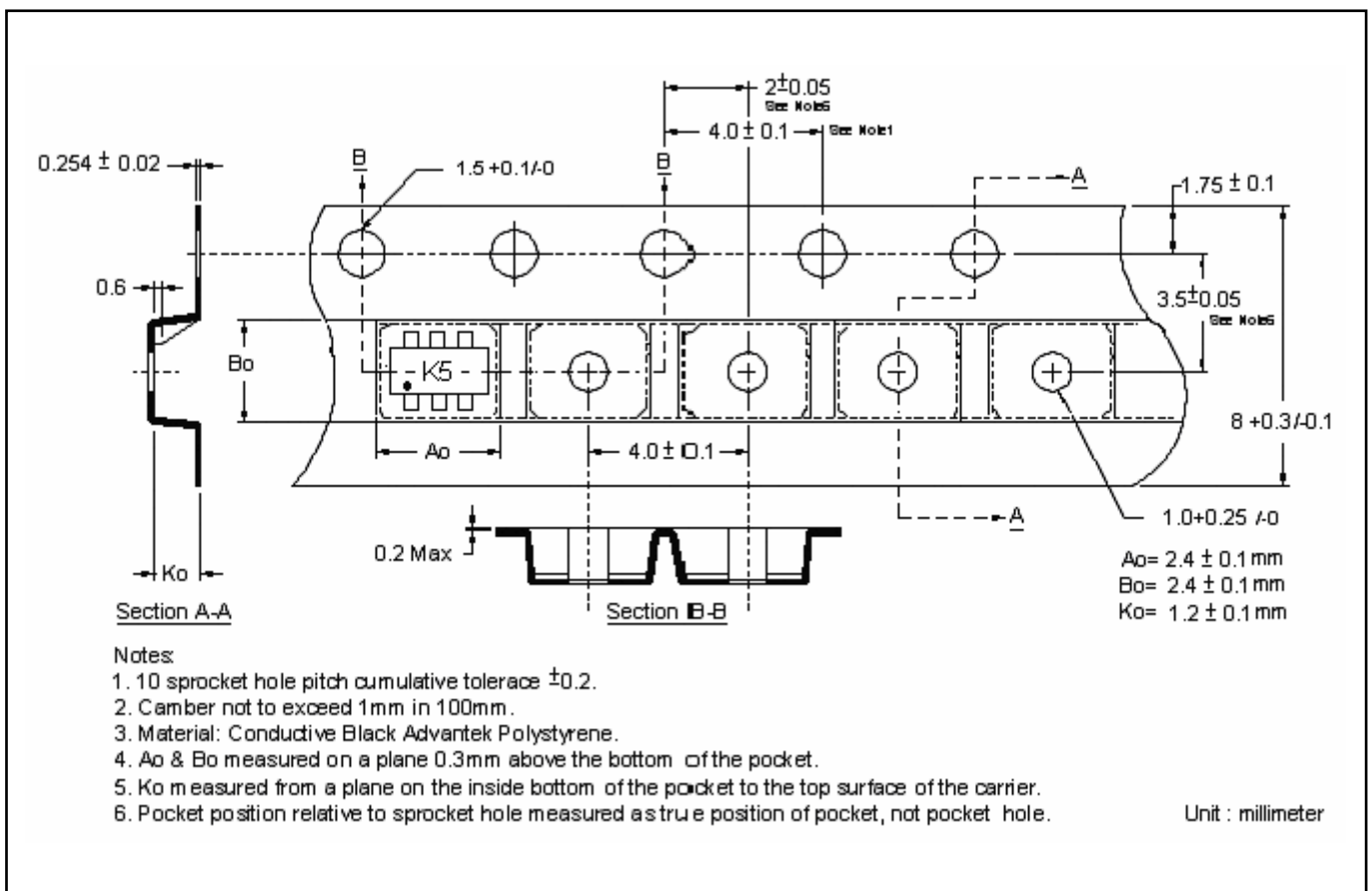
Typical Characteristics(Cont.)



Reel Dimension



Carrier Tape Dimension



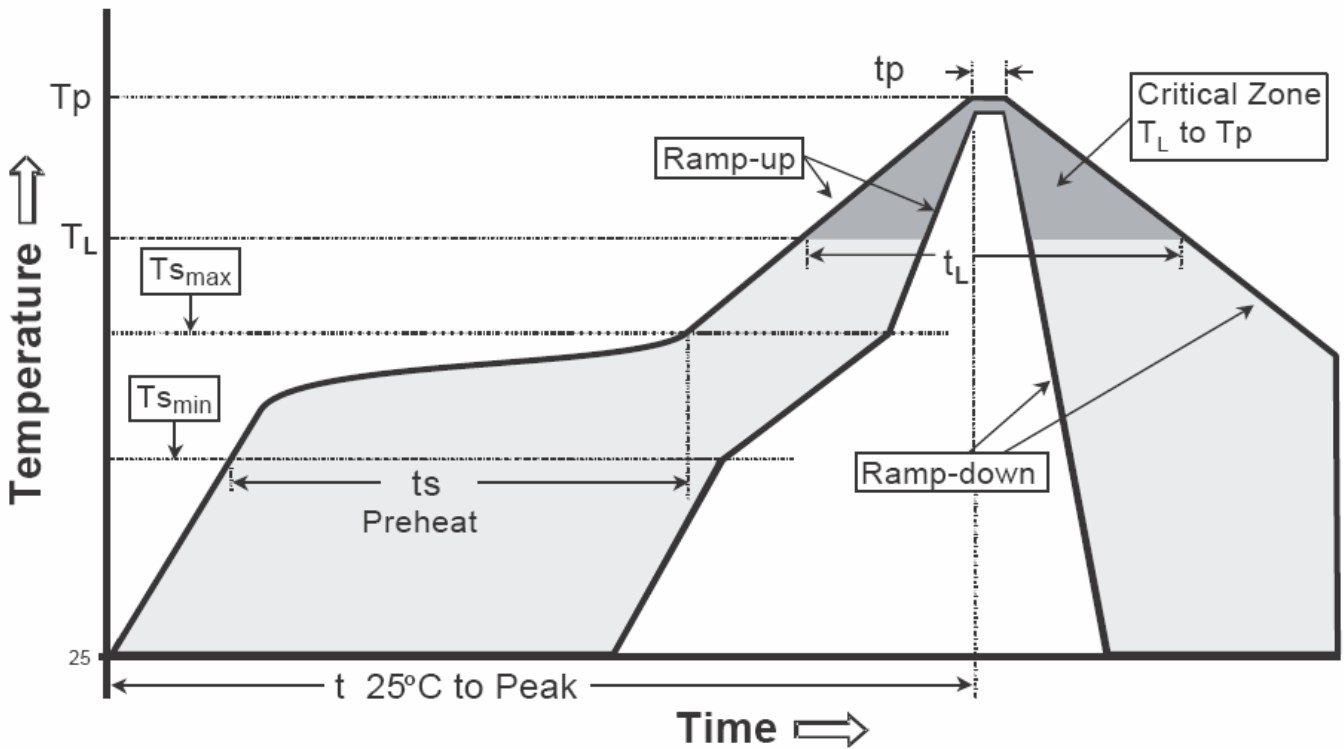
Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. A_0 & B_0 measured on a plane 0.3mm above the bottom of the pocket.
5. K_0 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.

Recommended wave soldering condition

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

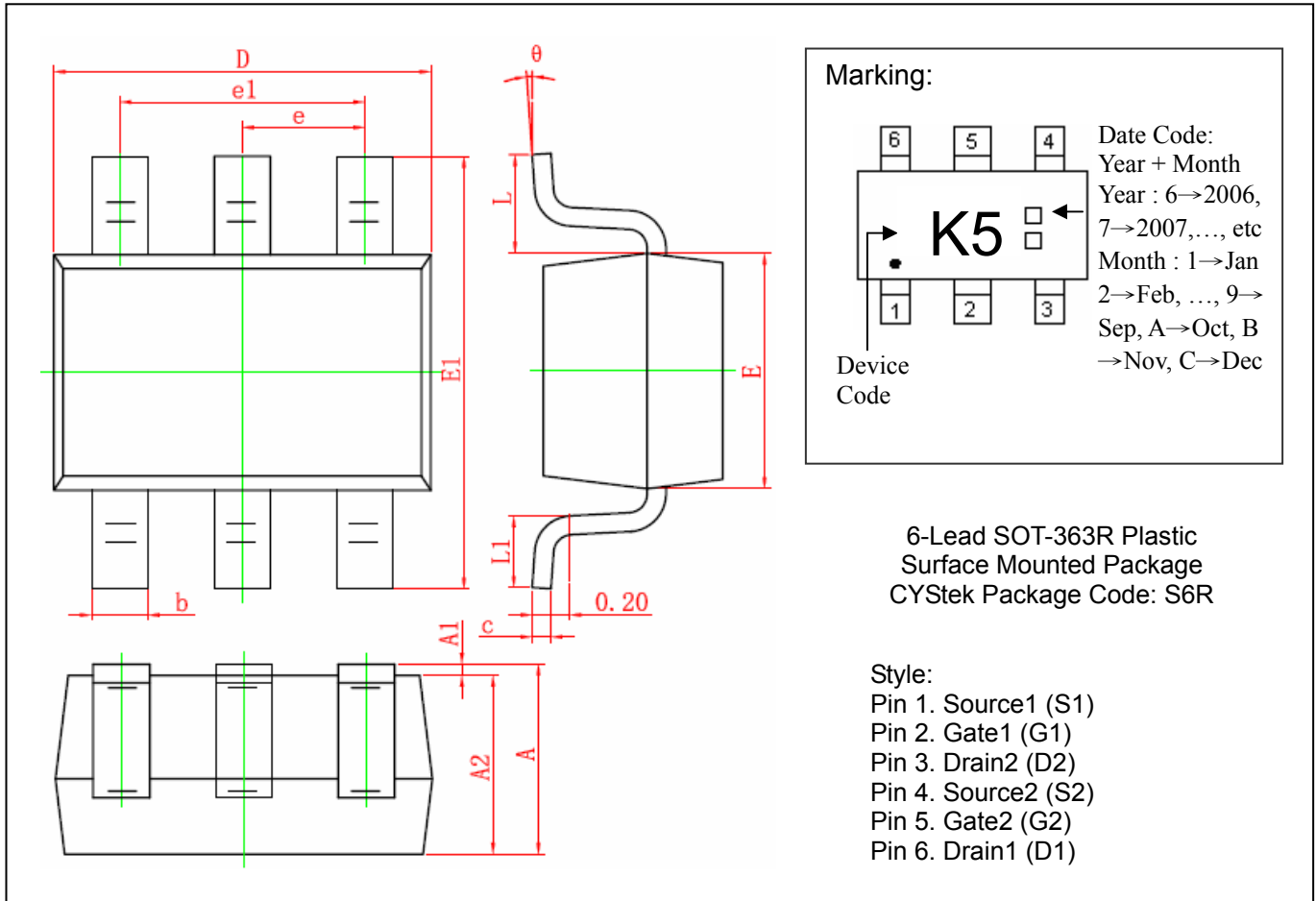
Recommended temperature profile for IR reflow



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)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)	183°C	217°C
- Time (tl)	60-150 seconds	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-363 Dimension



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650	TYP	0.026	TYP
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.150	0.350	0.006	0.014	L	0.525	REF	0.021	REF
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					

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.

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