

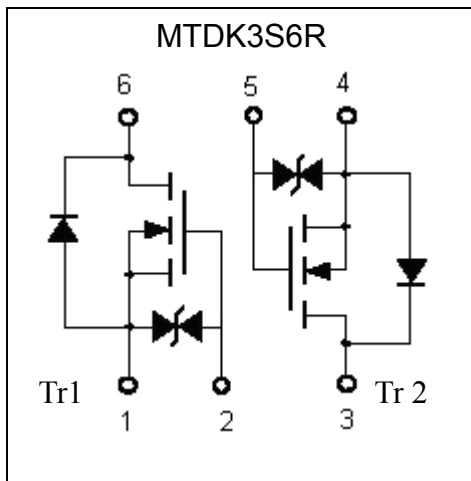
**ESD protected N-CHANNEL MOSFET**  
**MTDK3S6R**

BV <sub>DSS</sub>	20V
I <sub>D</sub>	100mA
R <sub>DS(on)</sub>	3Ω

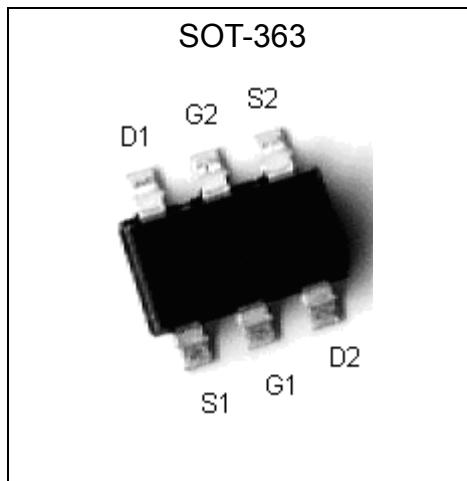
**Description**

- Low voltage drive, 1.8V
- Easy to use in parallel
- High speed switching
- ESD protected device
- Pb-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 <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	V
Continuous Drain Current	I <sub>D</sub>	100	mA
Pulsed Drain Current (Ta=25°C)	I <sub>DM</sub>	400 *1	mA
Total Power Dissipation	P <sub>D</sub>	300 *2	mW
ESD susceptibility		350 *3	V
Operating Junction and Storage Temperature Range	T <sub>j</sub>	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	R <sub>th,ja</sub>	415	°C/W

Note : \*1. Pulse Width ≤ 300μs, Duty cycle ≤ 2%  
 \*2. 200mW per element must not be exceeded  
 \*3. Human body model, 1.5kΩ in series with 100pF



**Electrical Characteristics (Ta=25°C)**

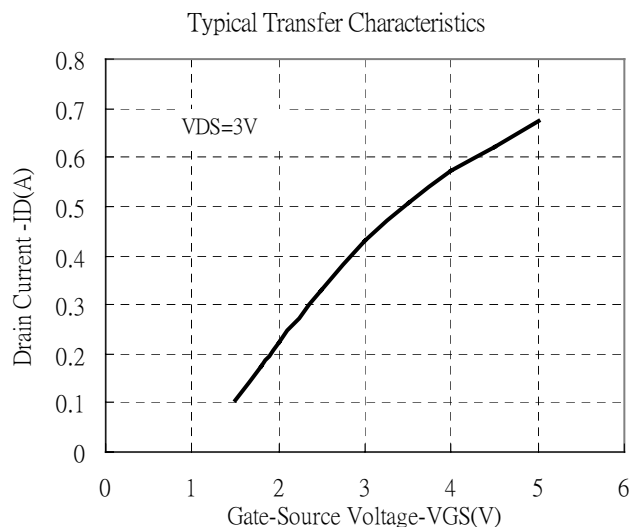
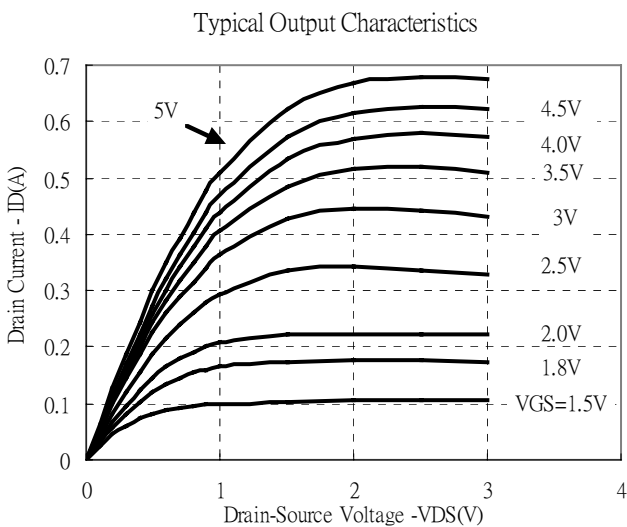
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =100μA
V <sub>GS(th)</sub>	0.5	-	1.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>GSS</sub>	-	-	±1	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0
I <sub>DSS</sub>	-	-	500	nA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0
R <sub>DS(ON)</sub>	-	1.7	3	Ω	V <sub>GS</sub> =4.5V, I <sub>D</sub> =100mA
	-	3.5	6		V <sub>GS</sub> =1.8V, I <sub>D</sub> =20mA
G <sub>FS</sub>	100	-	-	mS	V <sub>DS</sub> =5V, I <sub>D</sub> =100mA
<b>Dynamic</b>					
C <sub>iss</sub>	-	-	50	pF	V <sub>DS</sub> =10V, V <sub>GS</sub> =0, f=1MHz
C <sub>oss</sub>	-	-	25		
C <sub>rss</sub>	-	-	5		
<b>Source-Drain Diode</b>					
*V <sub>SD</sub>	-	-	1	V	V <sub>GS</sub> =0V, I <sub>S</sub> =10mA

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

**Ordering Information**

Device	Package	Shipping	Marking
MTDK3S6R	SOT-363 (Pb-free)	3000 pcs / Tape & Reel	KG

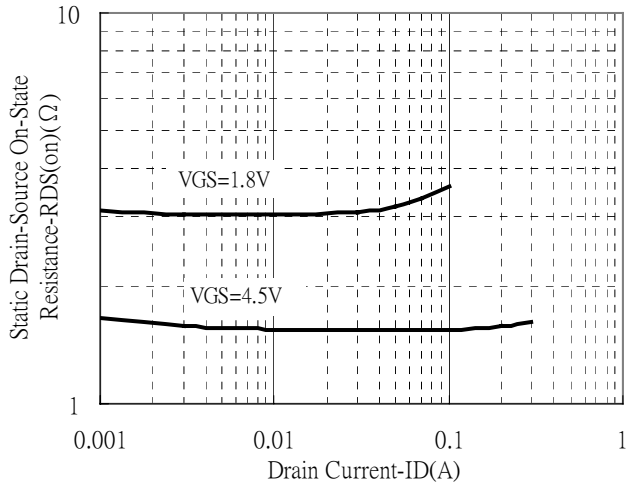
**Characteristic Curves**



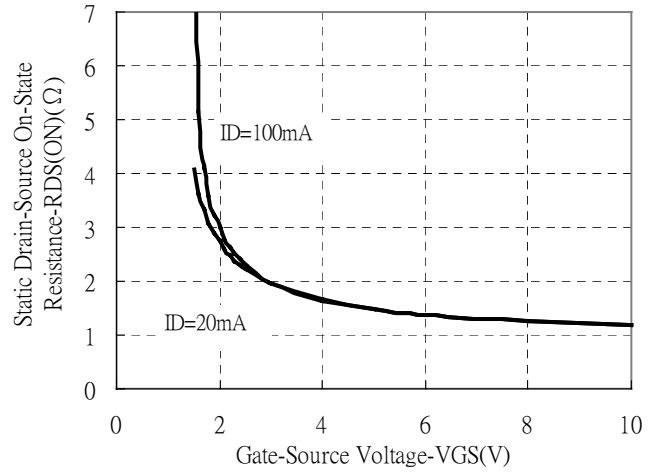


### Characteristic Curves(Cont.)

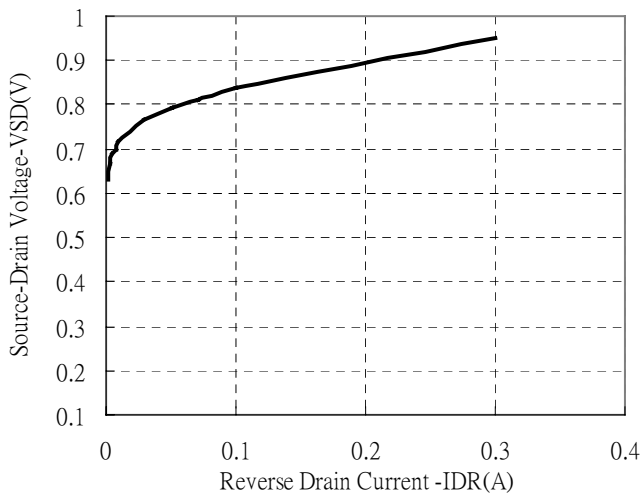
Static Drain-Source On-State resistance vs Drain Current



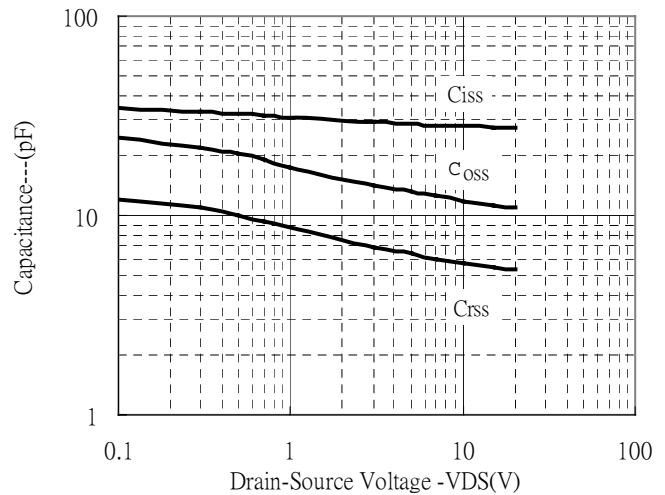
Static Drain-Source On-State Resistance vs Gate-Source Voltage



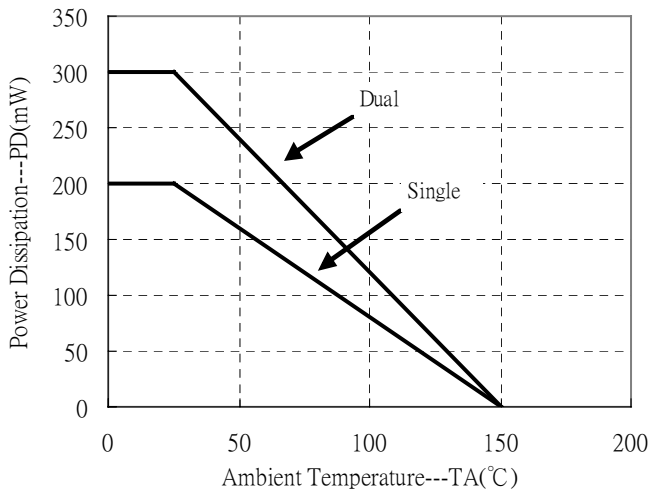
Reverse Drain Current vs Source-Drain Voltage



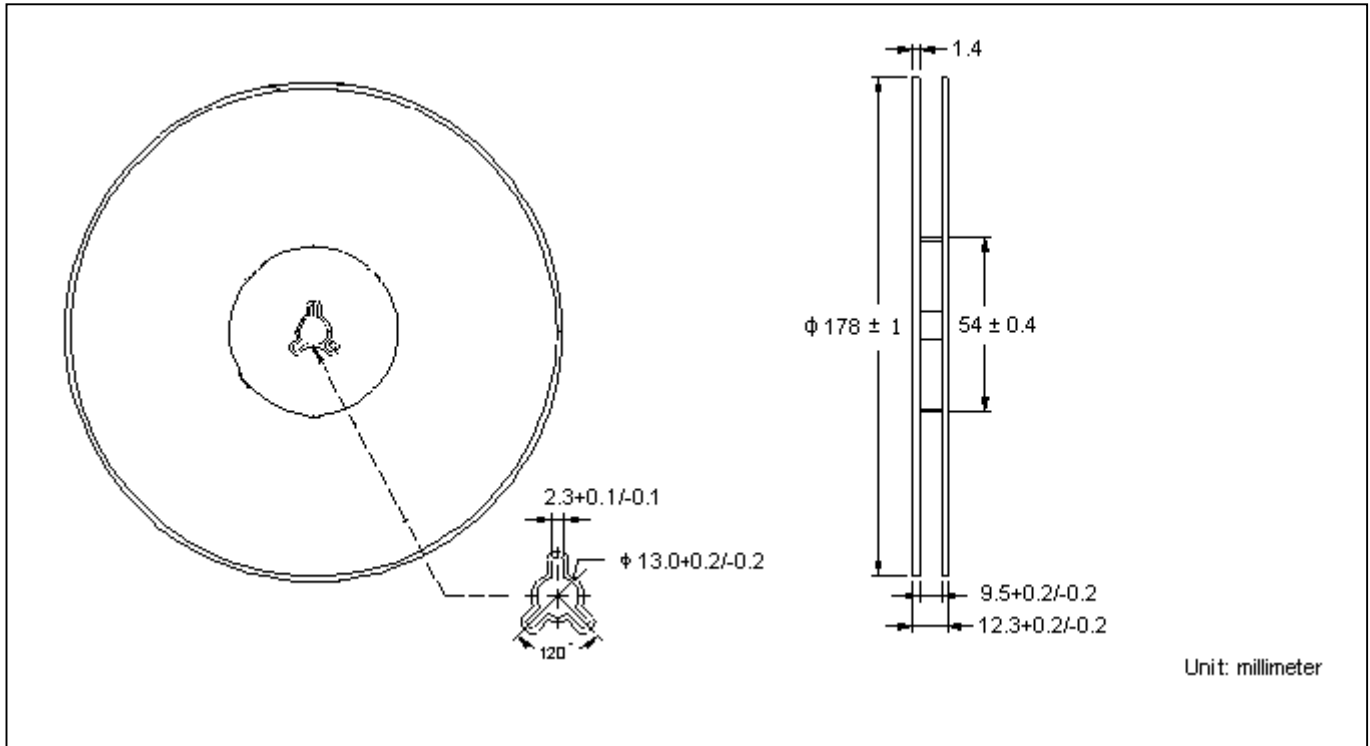
Capacitance vs Drain-to-Source Voltage



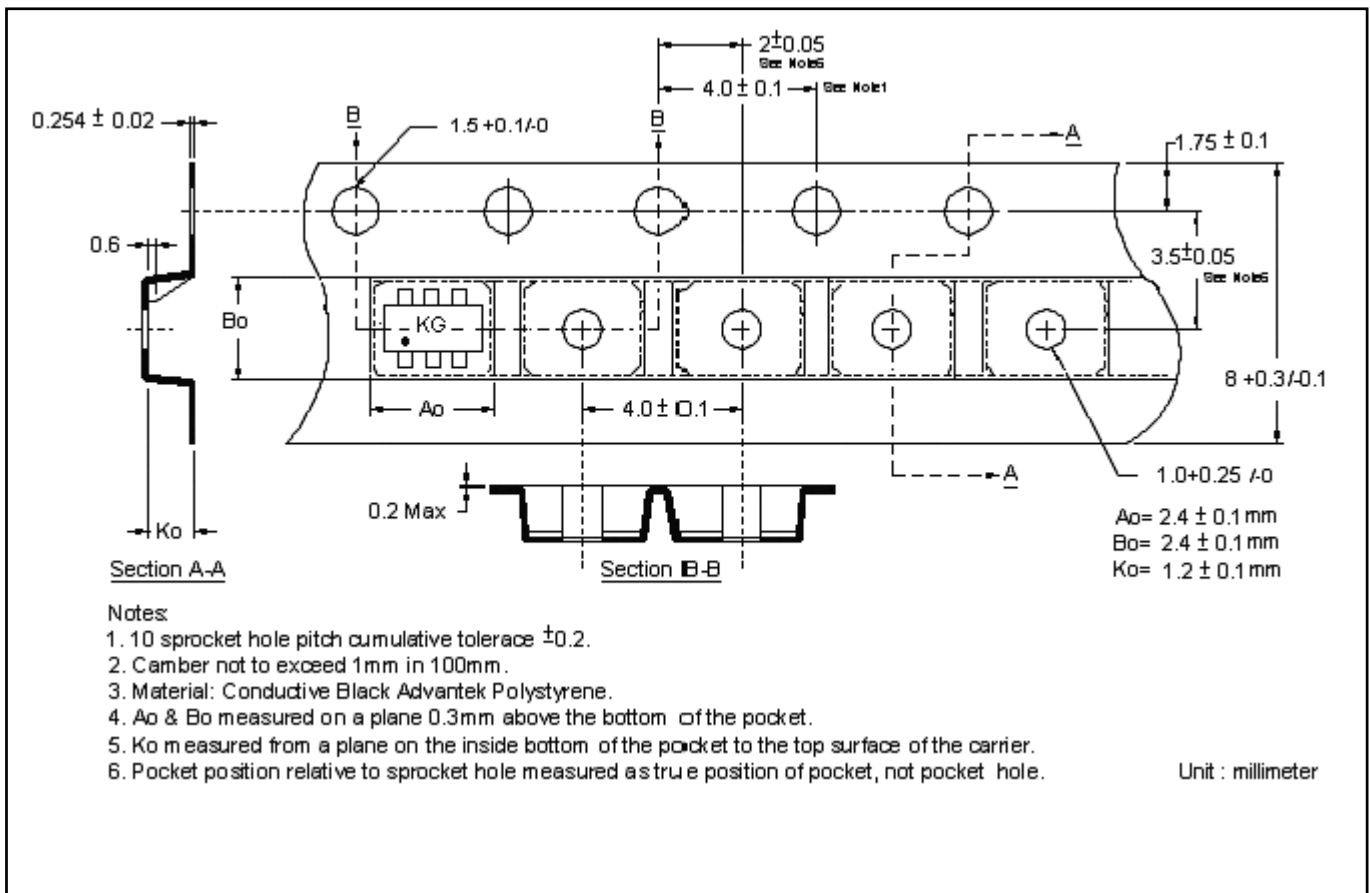
Power Derating Curves



**Reel Dimension**



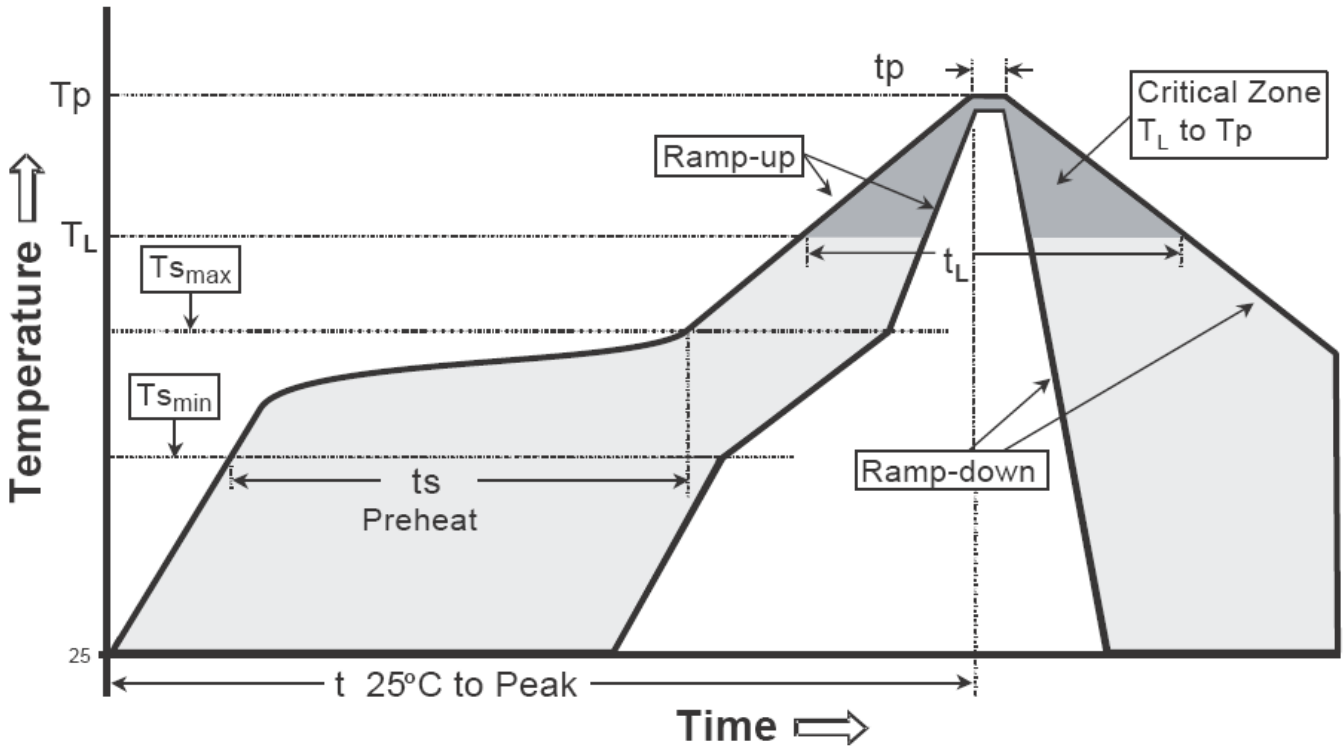
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

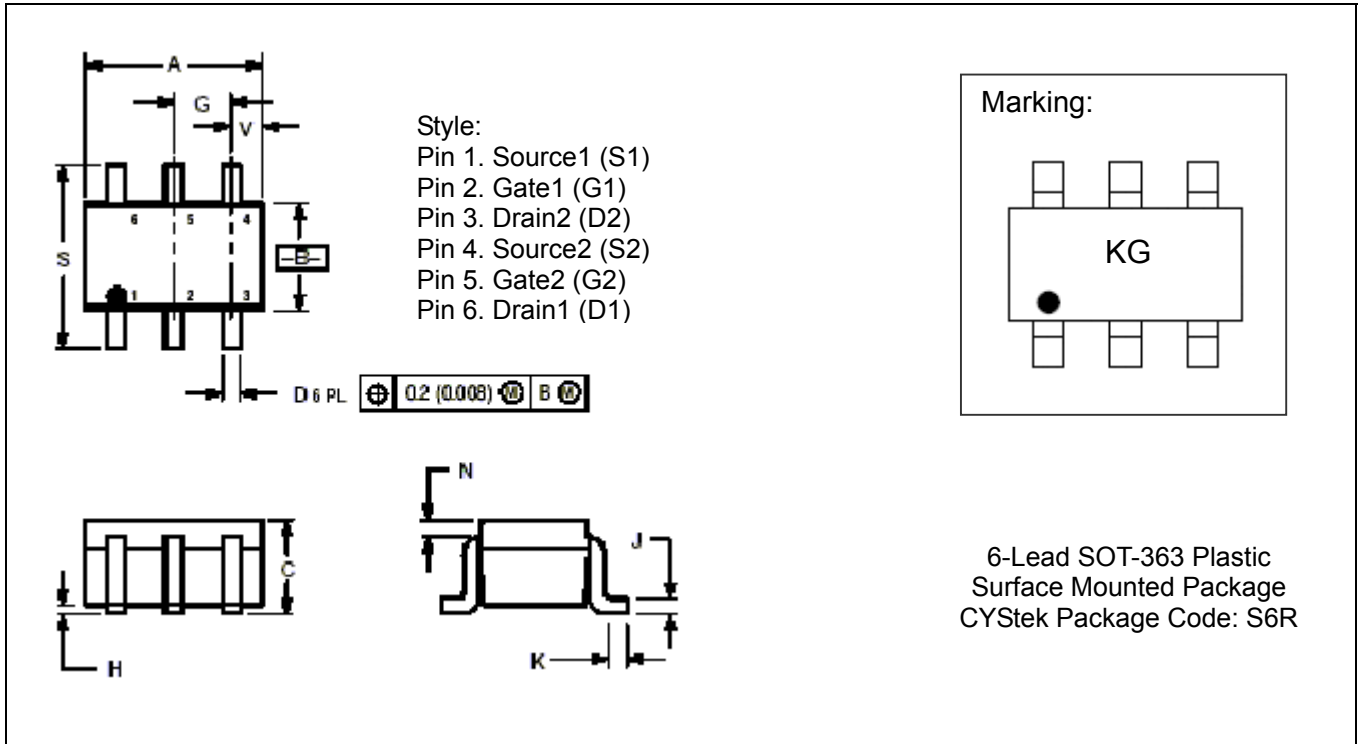
**Recommended temperature profile for IR reflow**



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(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**



\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.071	0.087	1.8	2.2	J	0.004	0.010	0.1	0.25
B	0.045	0.053	1.15	1.35	K	0.004	0.012	0.1	0.30
C	0.031	0.043	0.8	1.1	N	0.008 REF		0.20 REF	
D	0.004	0.012	0.1	0.3	S	0.079	0.087	2.00	2.40
G	0.026BSC		0.65BSC		Y	0.012	0.016	0.30	0.40
H	-	0.004	-	0.1					

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 : 42 Alloy ; pure tin plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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