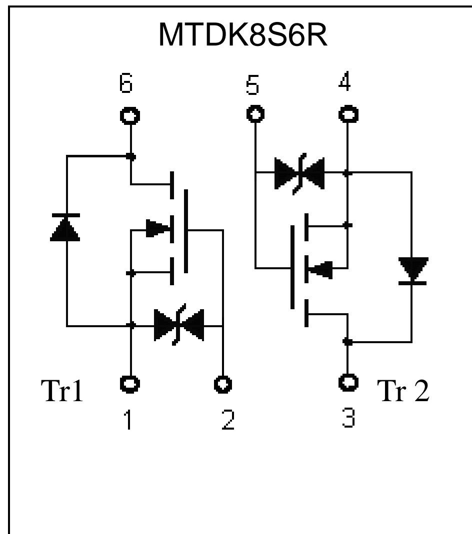
N-CHANNEL MOSFET (dual transistors)

MTDK8S6R

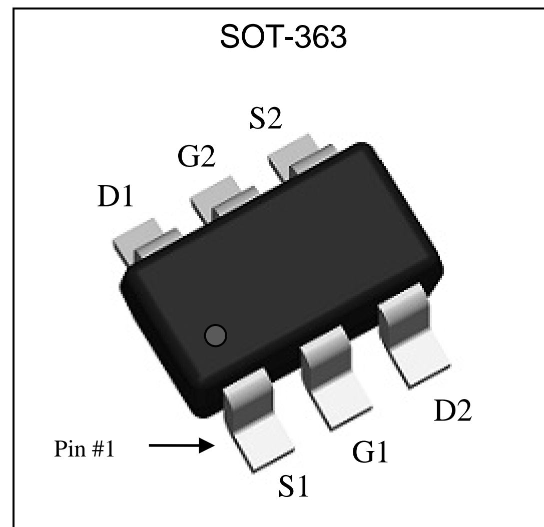
Description

- ESD protected gate, ≥ **2kV (HBM)**
- High speed switching
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free lead plating and halogen-free package

Symbol

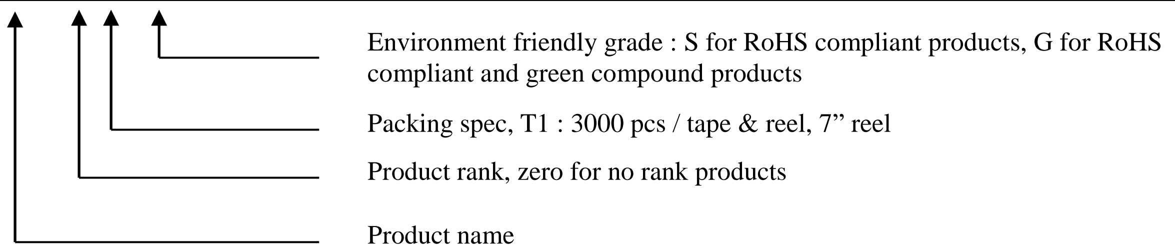


Outline



Ordering Information

Device	Package	Shipping
MTDK8S6R-0-T1-G	SOT-363 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel



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	
Continuous Drain Current @V_{GS}=10V, T_A=25°C (Note 3)	I_D	480	mA
Continuous Drain Current @V_{GS}=10V, T_A=70°C (Note 3)		384	
Pulsed Drain Current (Notes 1, 2)	I_{DM}	1900	
Total Power Dissipation (Note 3)	P_D	300	mW
ESD susceptibility (Note 4)	V_{ESD}	2000	V
Operating Junction Temperature Range	Tj	-55~+150	°C
Storage Temperature Range	Tstg	-55~+150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal resistance, Junction-to-Ambient , max (Note 3)	$R_{\theta JA}$	417	°C/W
Thermal resistance, Junction-to-Case , max	$R_{\theta JC}$	150	

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

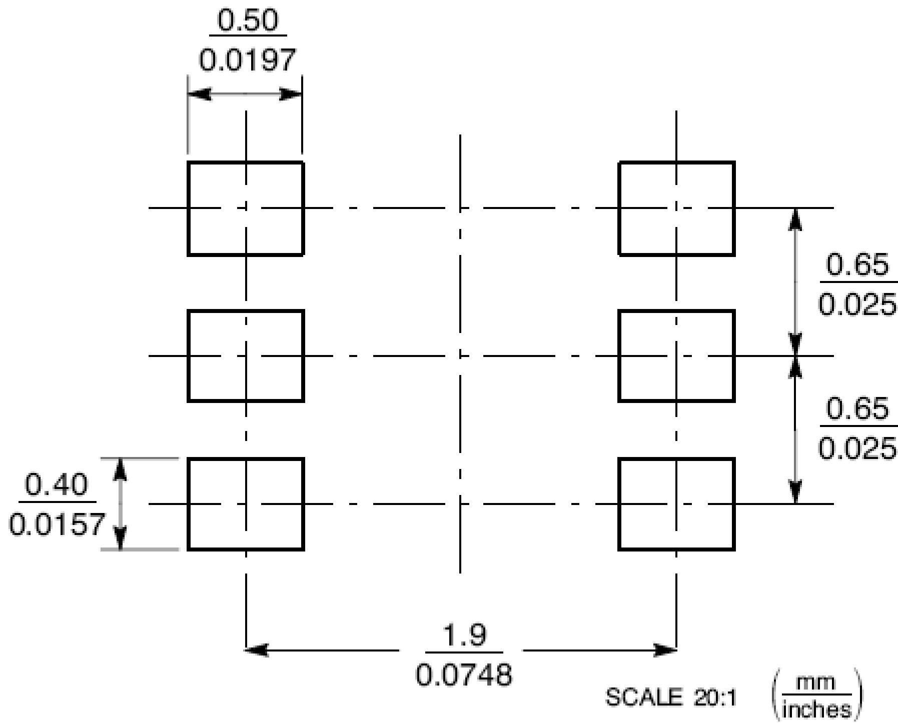
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}*	30	-	-	V	V_{GS}=0V, I_D=10μA
△BV_{DSS}/△Tj	-	25	-	mV/°C	Reference to 25°C, I_D=250μA
$V_{GS(th)}$	0.7	-	1.6	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±16V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS}=24V, V_{GS}=0V
	-	-	10		V_{DS}=24V, V_{GS}=0V (Tj=70°C)
$R_{DS(ON)}$	-	0.38	0.8	Ω	V_{GS}=10V, I_D=500mA
	-	0.44	1.3		V_{GS}=4.5V, I_D=200mA
	-	0.63	3		V_{GS}=2.5V, I_D=10mA
G_{FS}	100	370	-	mS	V_{DS}=5V, I_D=100mA
Dynamic					
C_{iss}	-	28	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
C_{oss}	-	14	-		
C_{rss}	-	4.2	-		
$t_{d(ON)}$	-	3	-	ns	V_{DS}=15V, I_D=0.5A, V_{GS}=10V, R_G=1Ω
t_r	-	15.4	-		
$t_{d(OFF)}$	-	10	-		
t_f	-	12	-		

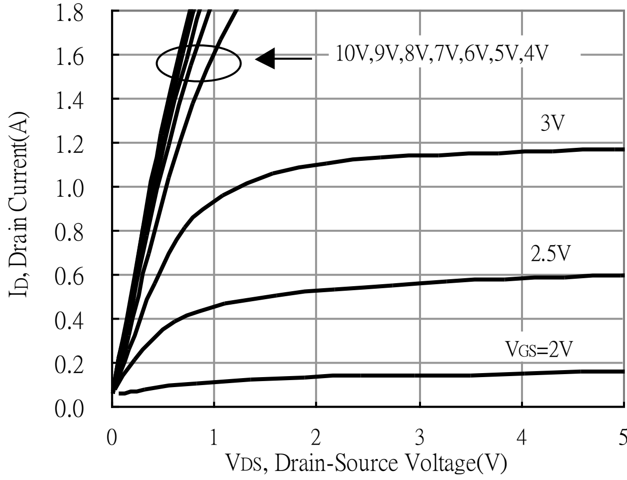
Qg	-	1.7	-	nC	V_{DS}=15V, I_D=1A, V_{GS}=10V
Qgs	-	0.6	-		
Qgd	-	0.6	-		
Source-Drain Diode					
I_S	-	-	0.48	A	
I_{SM}	-	-	1.9		
*V_{SD}	-	0.78	1.2	V	V_{GS}=0V, I_S=0.1A
*trr	-	4.8	-	ns	I_F=0.5A, dI_F/dt=100A/μs
*Qrr	-	1.1	-	nC	

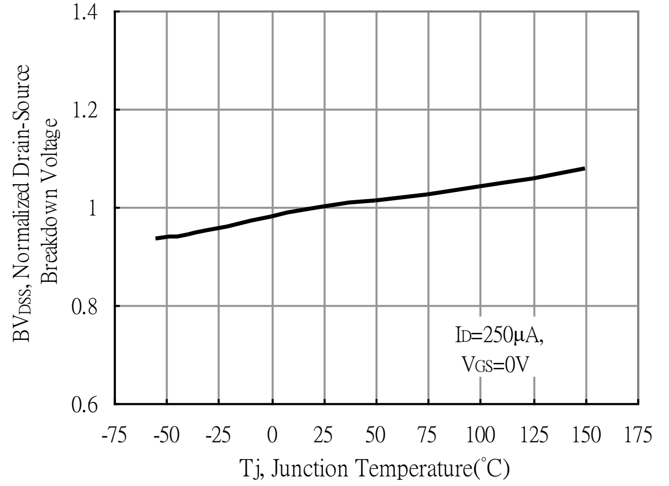
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

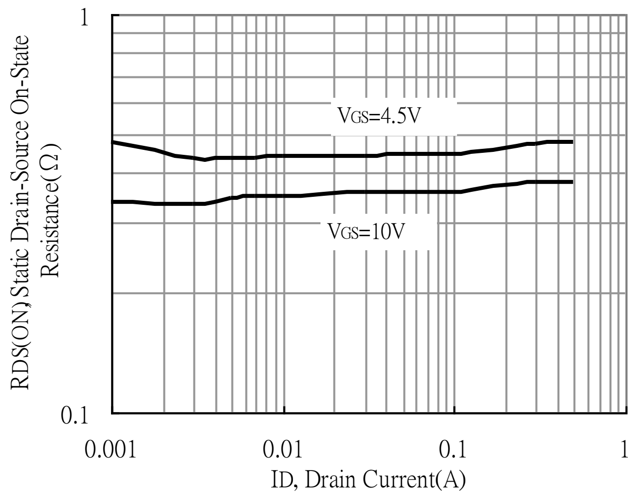
Recommended Soldering Footprint

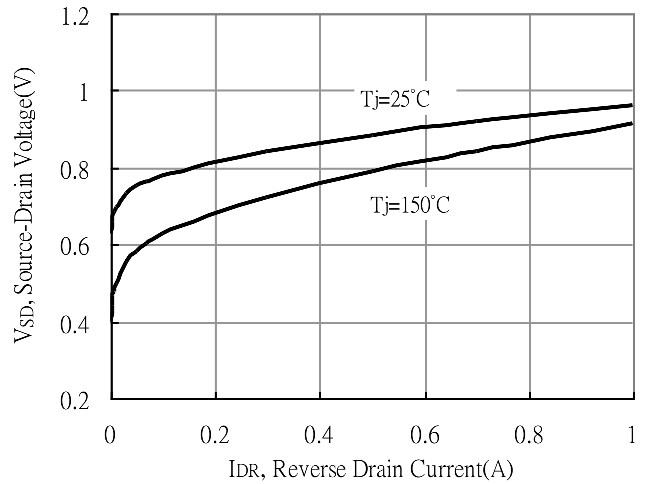


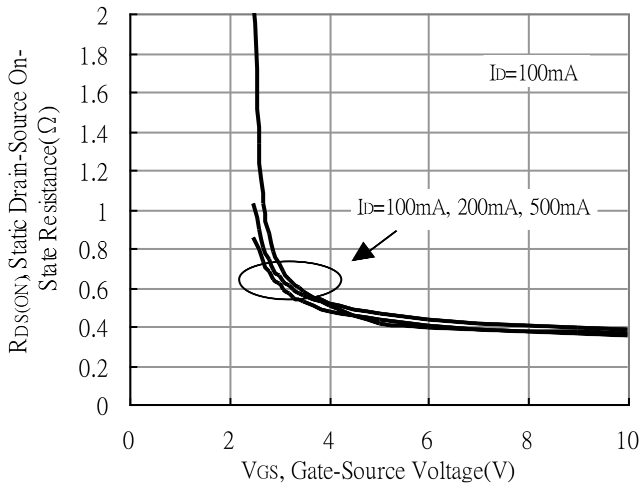
Typical Characteristics

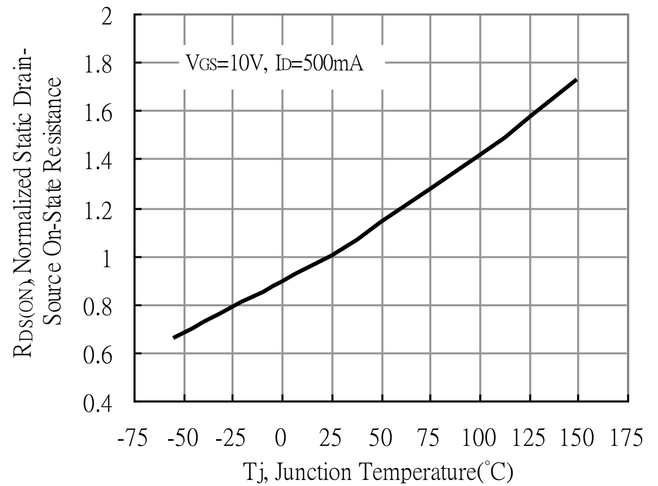




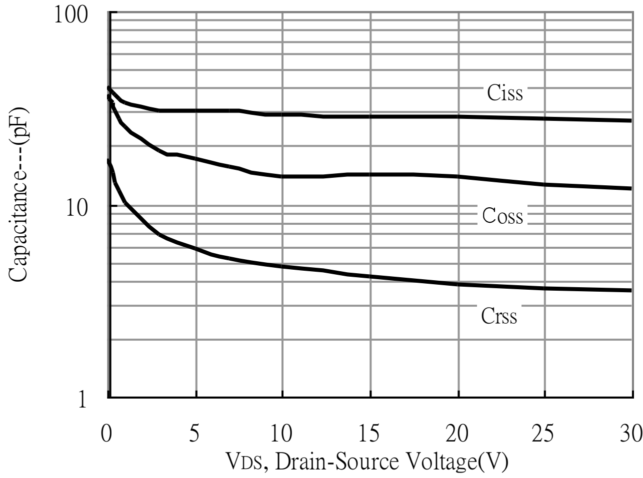


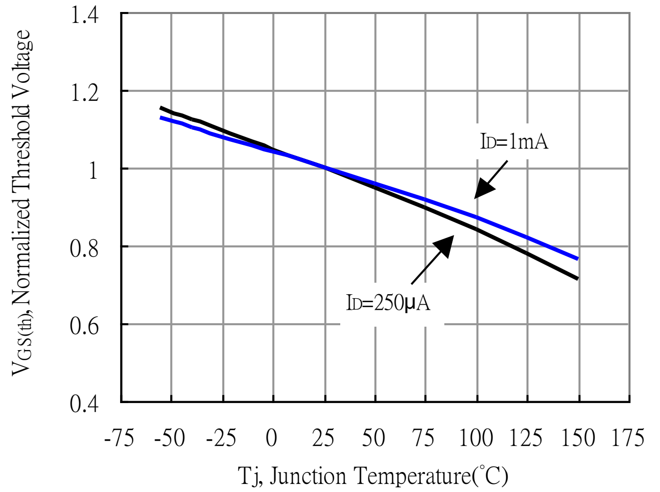


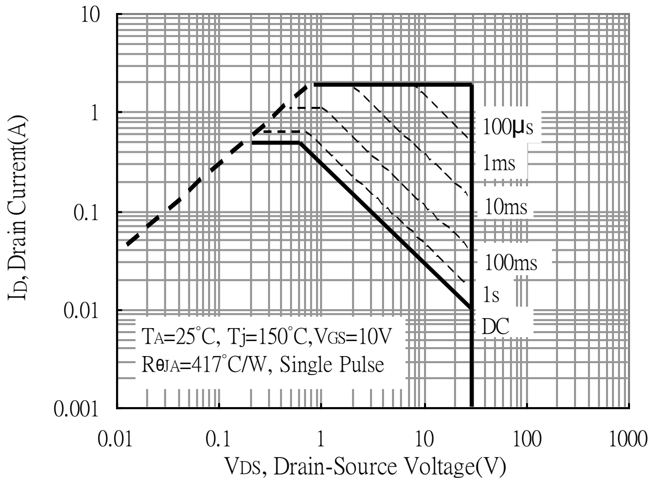


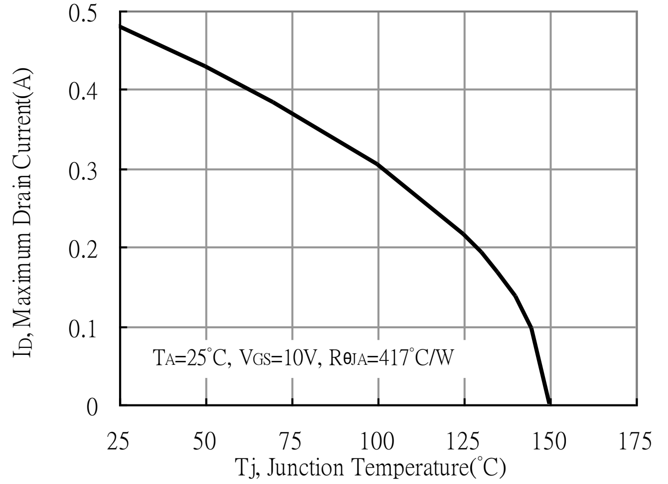


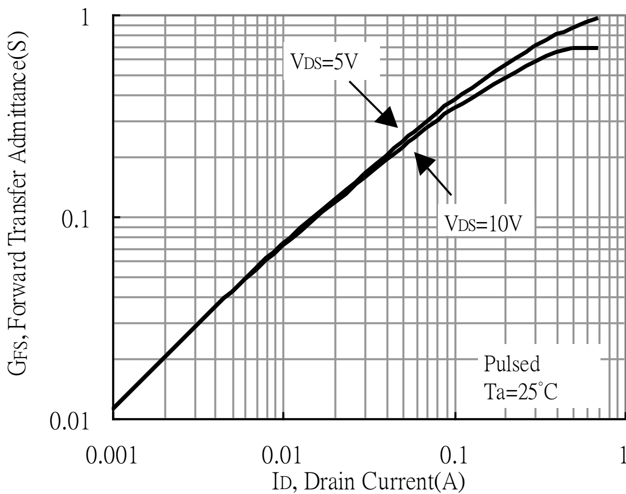
Typical Characteristics(Cont.)

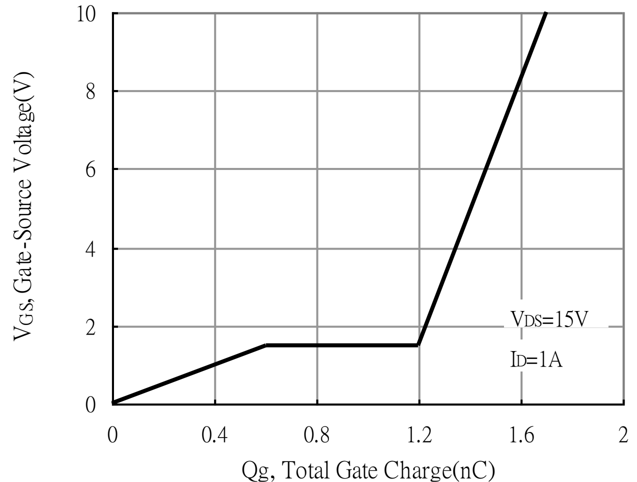




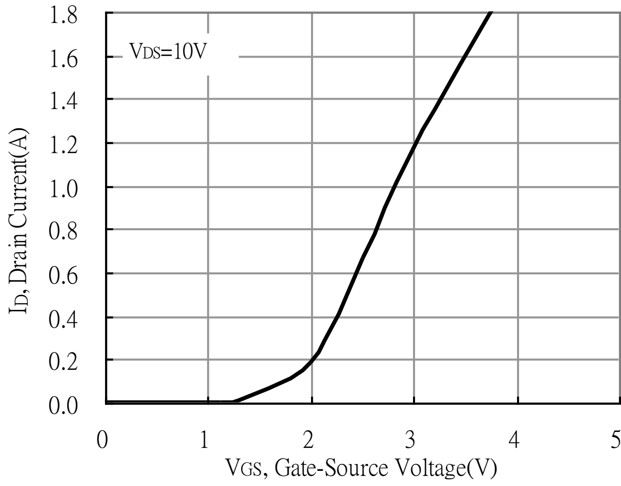


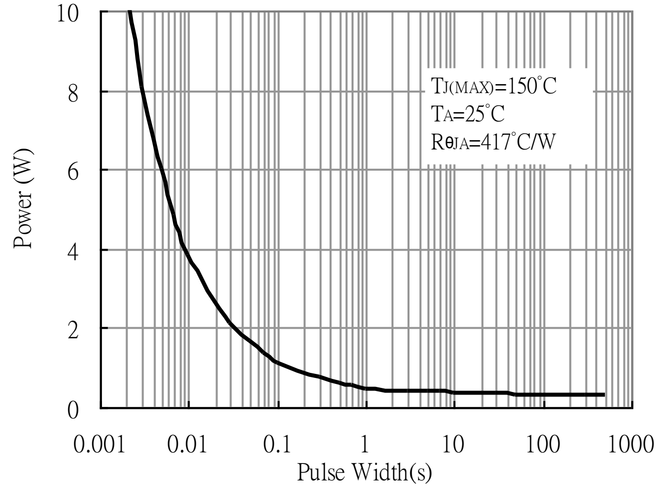


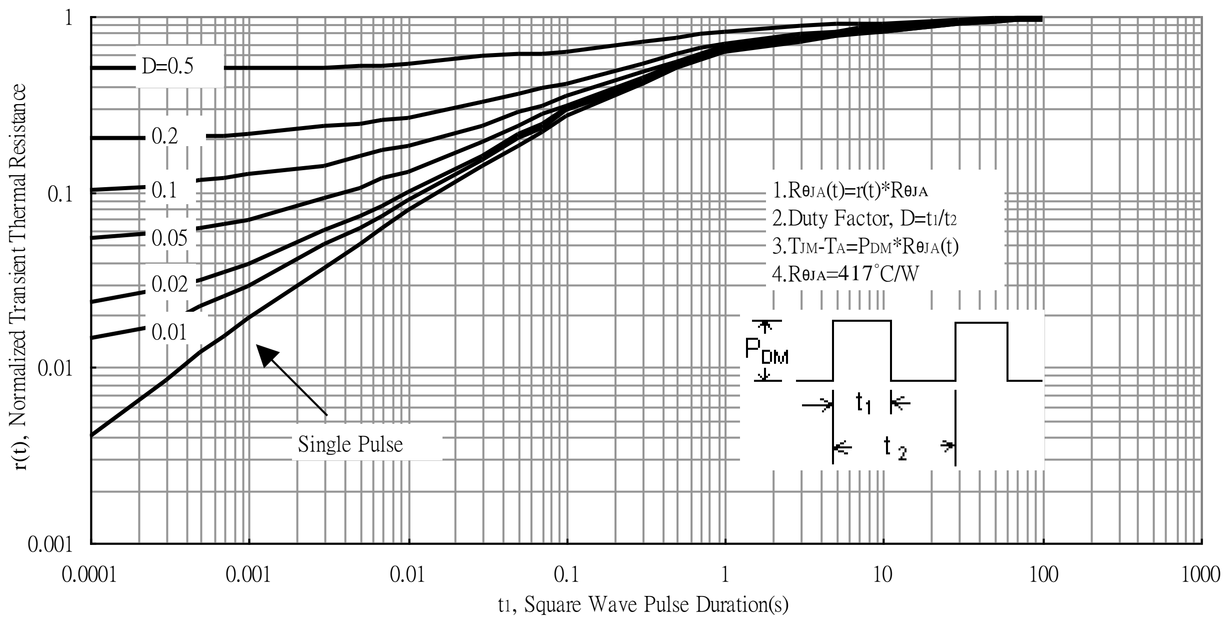




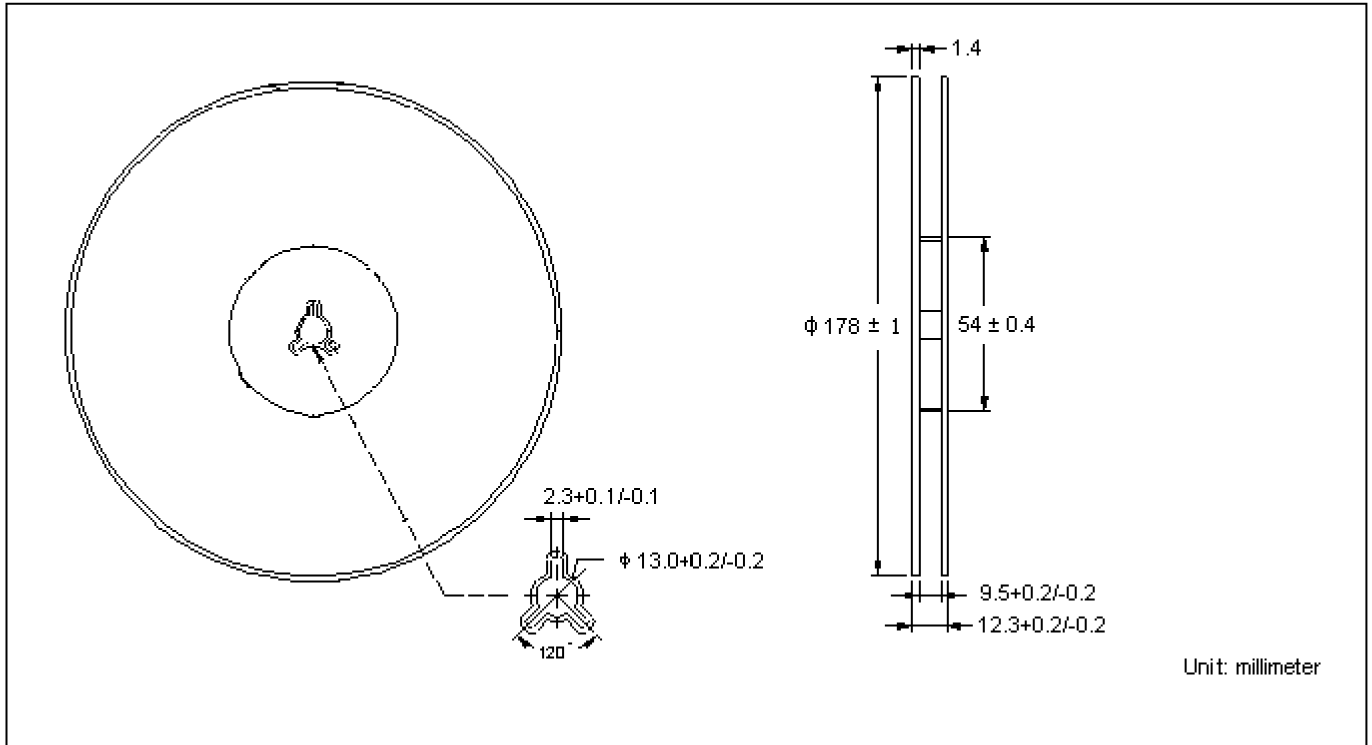
Typical Characteristics(Cont.)



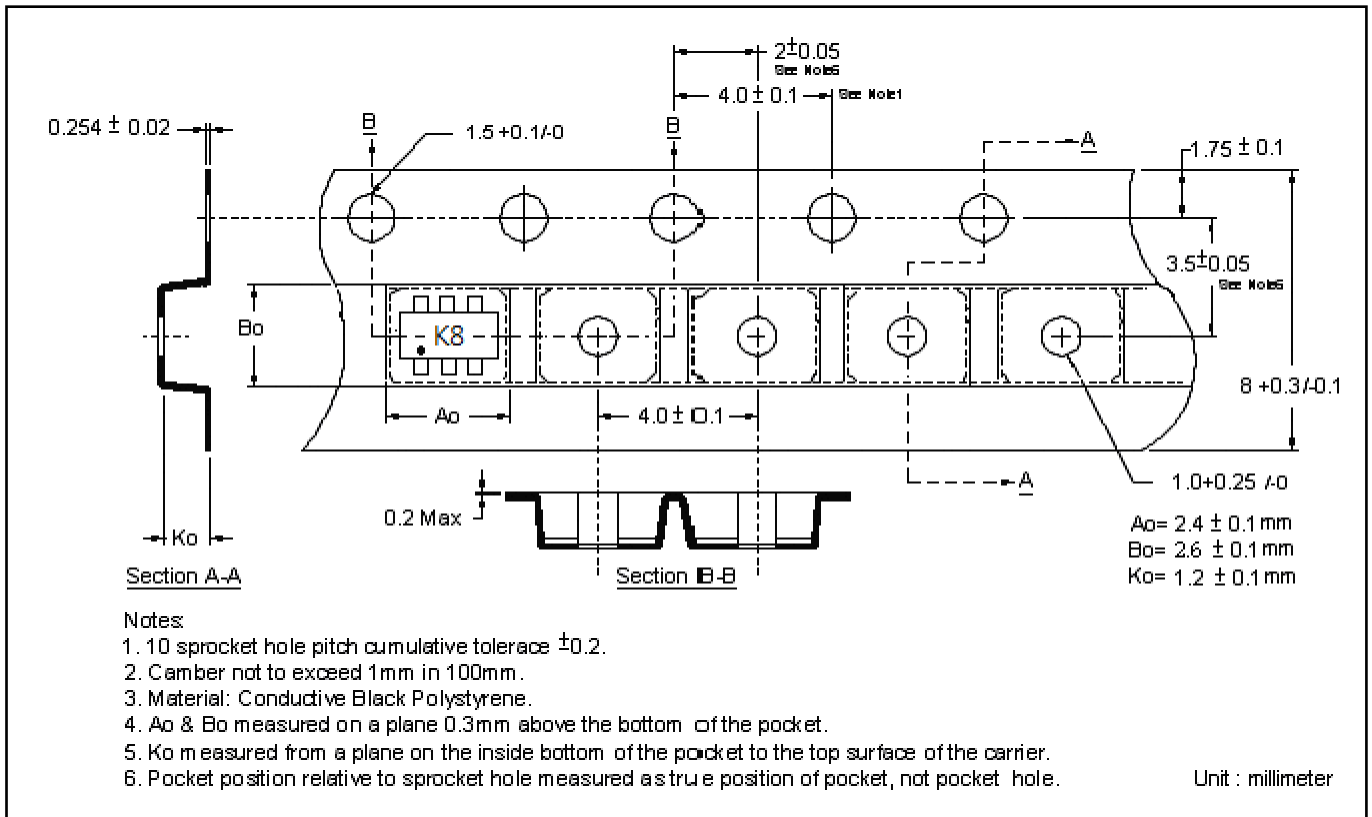




Reel Dimension



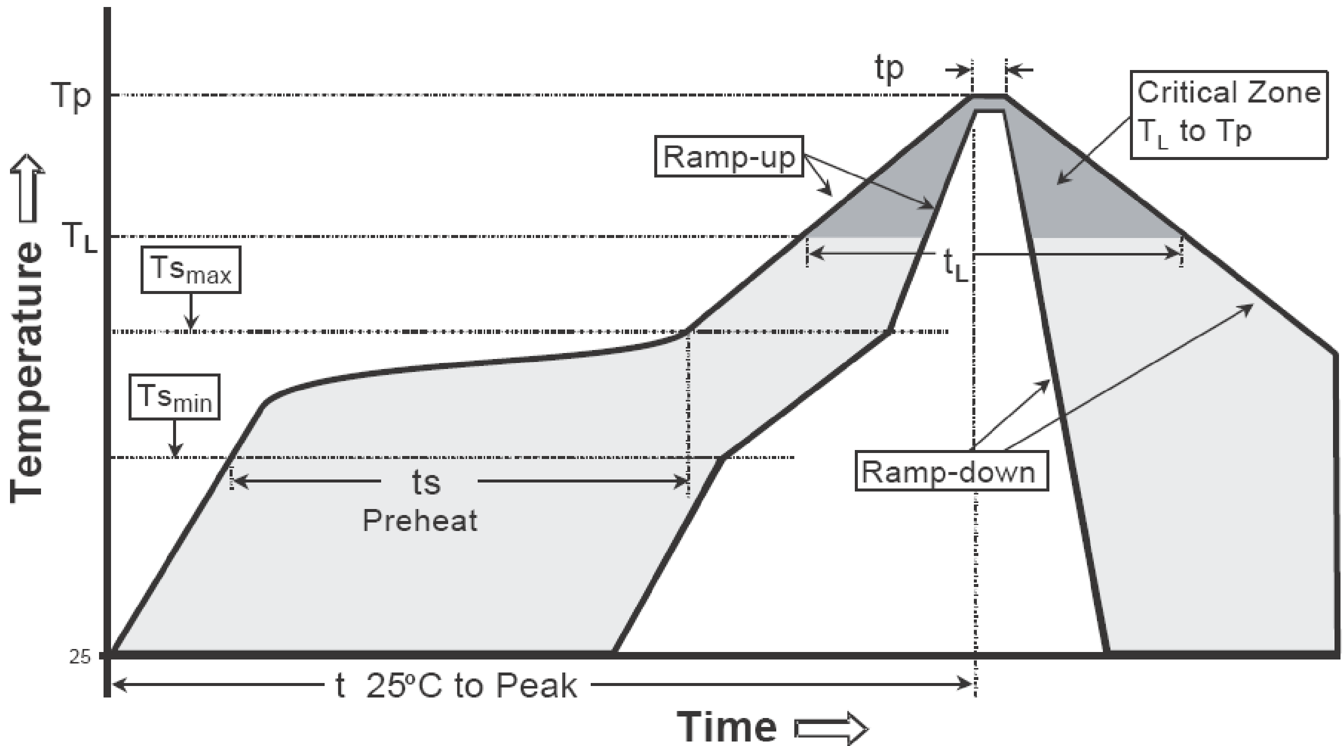
Carrier Tape Dimension



Recommended wave soldering condition

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

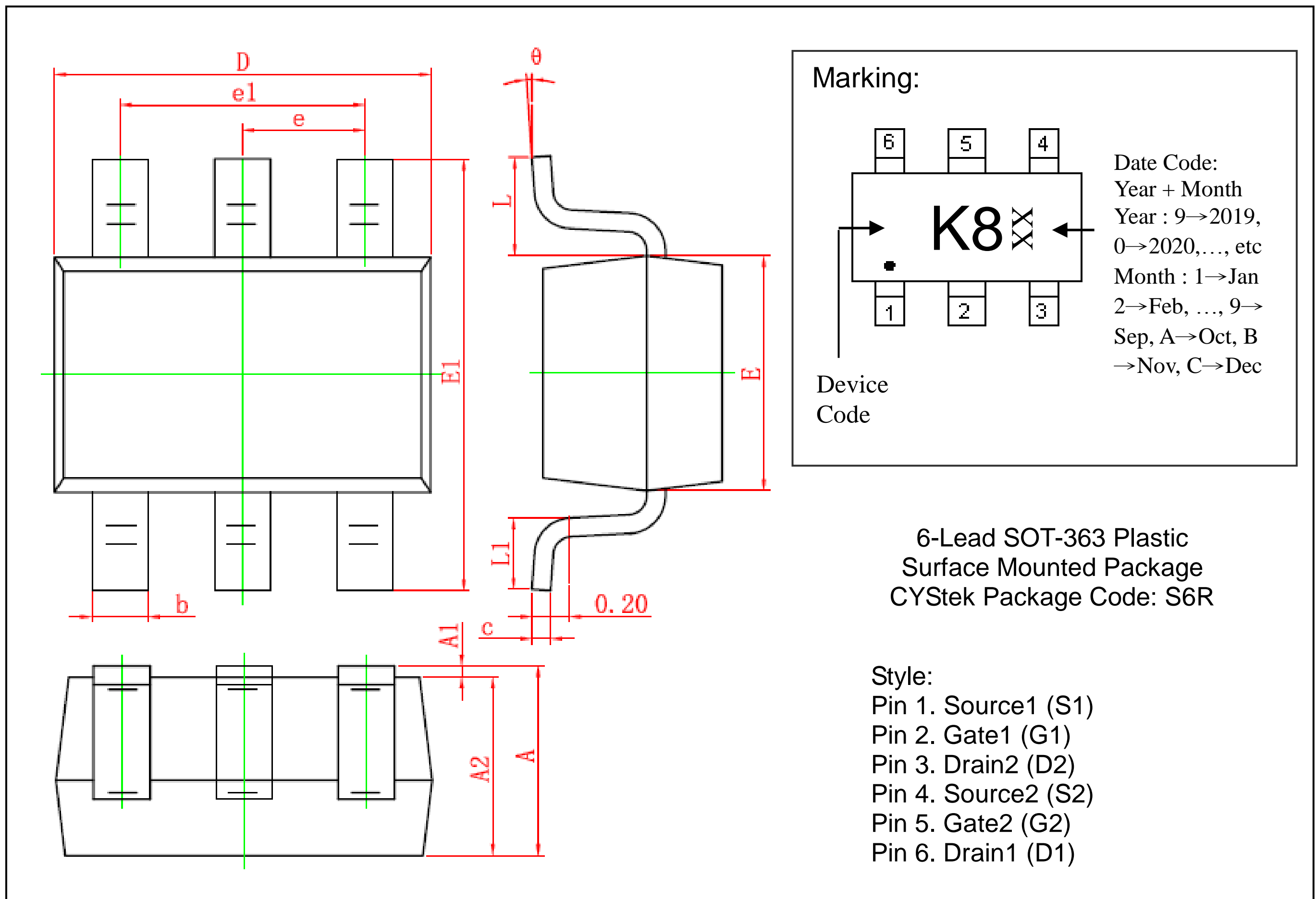
Recommended temperature profile for IR reflow



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) −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 (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-363 Dimension



6-Lead SOT-363 Plastic
Surface Mounted Package
CYStek Package Code: S6R

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)

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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