

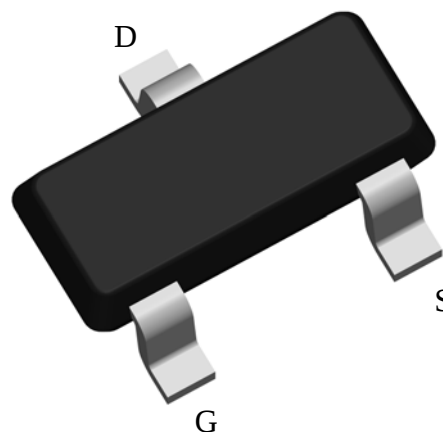
60V N-Channel Enhancement Mode MOSFET

Outline

Features:

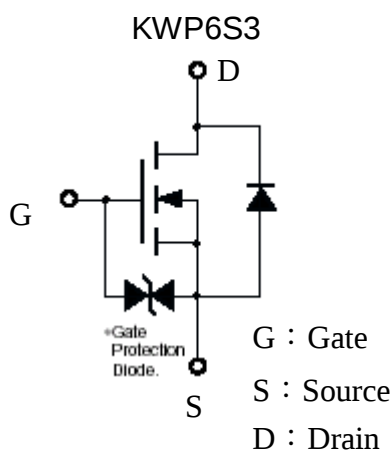
- Simple drive requirement
- Small package outline
- ESD protected gate, $\geq 2\text{kV}$ (HBM)
- Pb-free lead plating and halogen-free package

SOT-323



Symbol

BV_{DSS}	60V
$I_D@V_{GS}=10V, T_A=25^\circ C$	0.24A
$R_{DS(on)(MAX)}@V_{GS}=10V, I_D=0.5A$	1.1Ω (typ.)
$R_{DS(on)(MAX)}@V_{GS}=4.5V, I_D=0.2A$	1.3Ω (typ.)



Ordering Information

Device	Package	Shipping
KWP6S3	SOT-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @V _{GS} =10V, T _A =25°C (Note 3)	I _D	0.24	A
Continuous Drain Current @V _{GS} =10V, T _A =70°C (Note 3)		0.19	
Pulsed Drain Current (Notes 1, 2)	I _{DM}	0.96	
ESD susceptibility (Note 4)	V _{ESD}	2000	V
Maximum Power Dissipation@ T _A =25°C (Note 3)	P _D	0.2	W
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note 3)	R _{θJA}	625	°C/W
Thermal Resistance, Junction-to-Case, max	R _{θJC}	250	

- 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

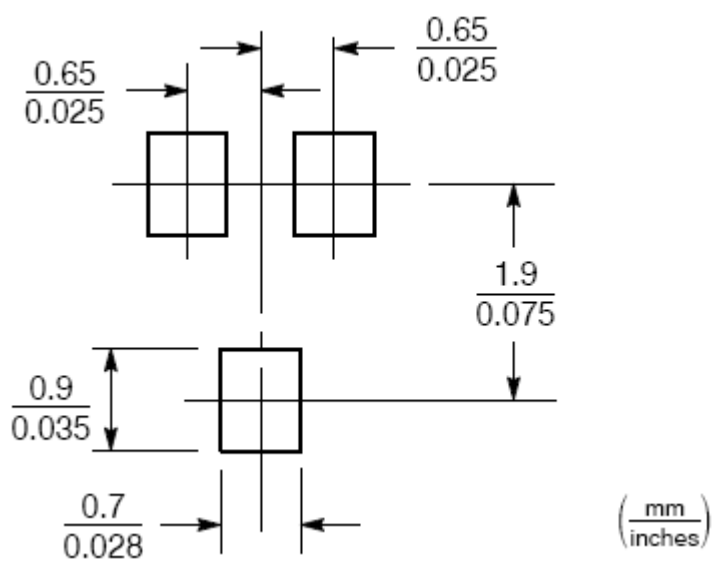
Electrical Characteristics (T_j=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	60	-	-	V	V _{GS} =0V, I _D =250μA
ΔBV _{DSS} /ΔT _j	-	0.06	-	V/°C	Reference to 25°C, I _D =250μA
V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =60V, V _{GS} =0V
	-	-	10		V _{DS} =48V, V _{GS} =0V (T _j =70°C)
*R _{DS(ON)}	-	1.1	2.5	Ω	I _D =0.5A, V _{GS} =10V
	-	1.3	3		I _D =0.2A, V _{GS} =4.5V
*G _{FS}	-	0.25	-	S	V _{DS} =10V, I _D =0.1A
Dynamic					
C _{iss}	-	23	-	pF	V _{DS} =30V, V _{GS} =0V, f=1MHz
C _{oss}	-	7	-		
C _{rss}	-	1	-		
t _{d(ON)}	-	3.8	-	ns	V _{DS} =30V, I _D =0.5A, V _{GS} =10V, R _G =1Ω
t _r	-	15.4	-		
t _{d(OFF)}	-	9.8	-		
t _f	-	16.2	-		

Qg	-	1.6	-	nC	V _{DS} =48V, I _D =0.5A, V _{GS} =10V
Qgs	-	0.6	-		
Qgd	-	0.6	-		
Source-Drain Diode					
I _S	-	-	0.24	A	
I _{SM}	-	-	0.96		
*V _{SD}	-	0.8	1.2	V	V _{GS} =0V, I _S =0.1A
*trr	-	9.2	-	ns	I _F =0.5A, dI _F /dt=100A/μs
*Qrr	-	3	-	nC	

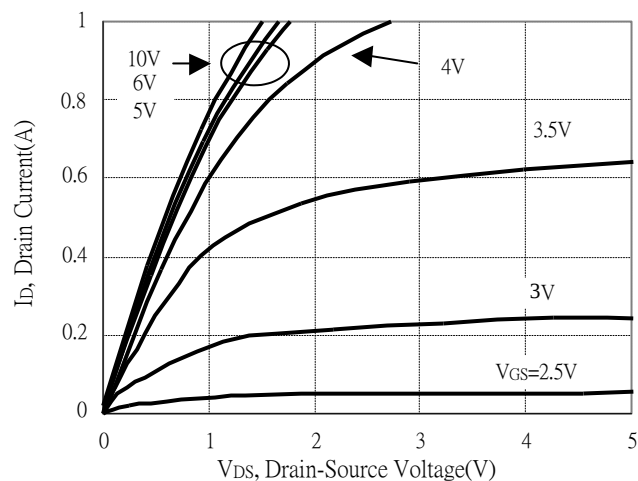
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

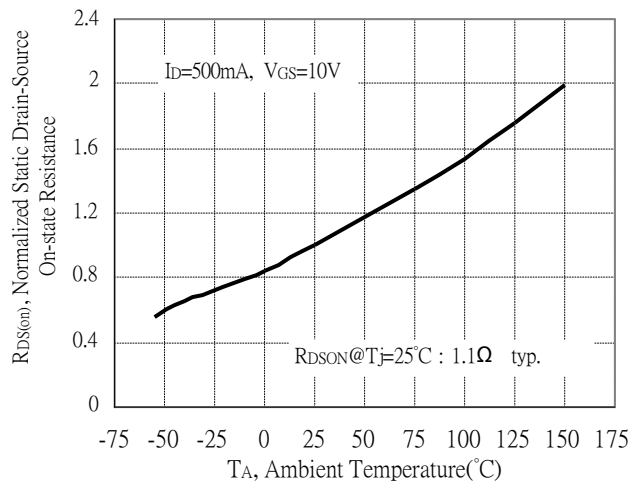


Typical Characteristics

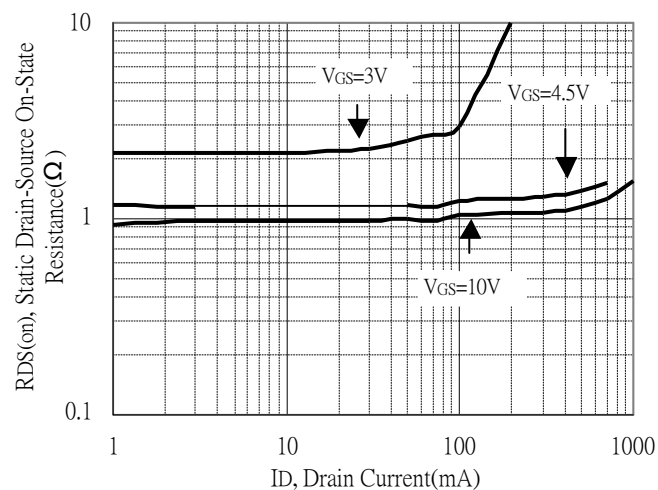
Typical Output Characteristics



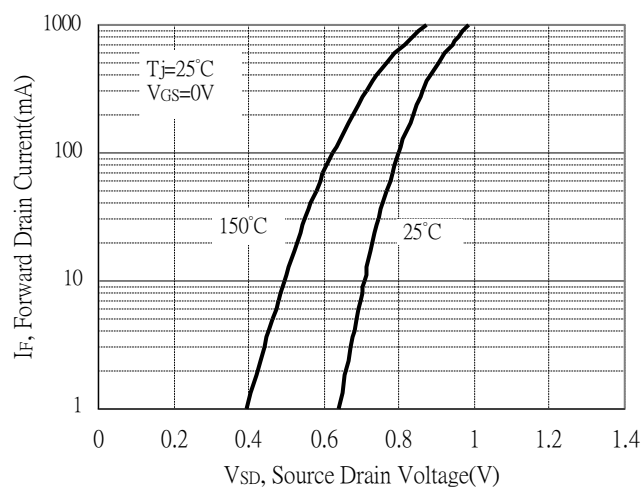
Static Drain-Source On-resistance vs Ambient Temperature



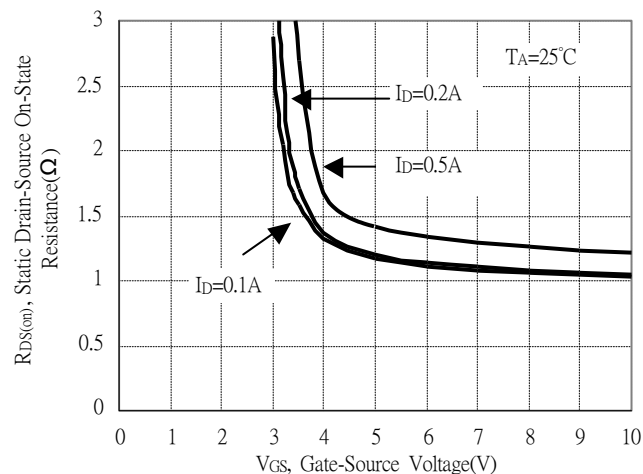
Static Drain-Source On-State resistance vs Drain Current



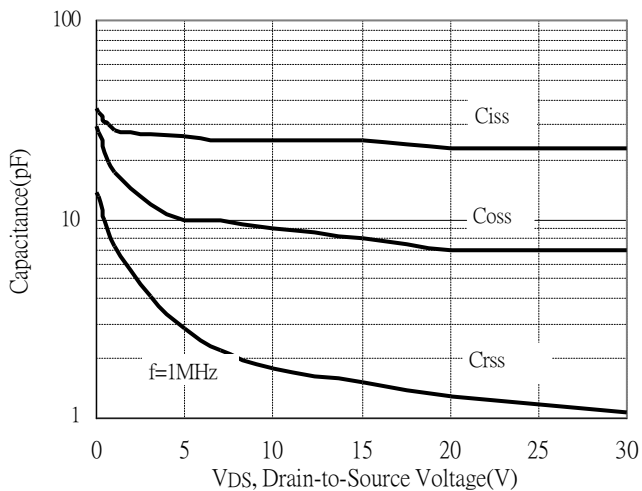
Forward Drain Current vs Source-Drain Voltage



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

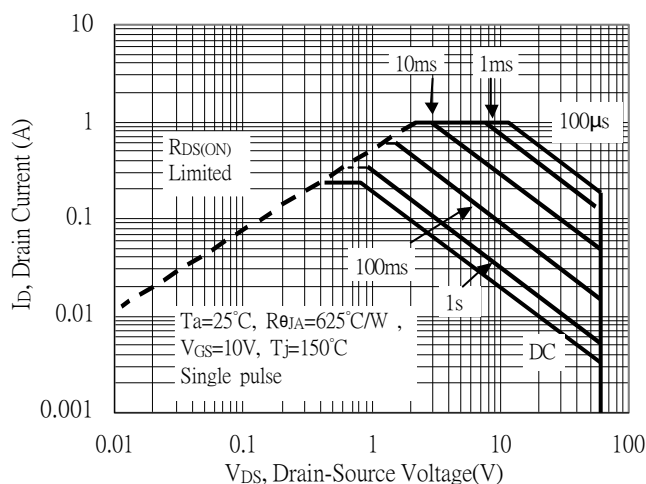


Capacitance vs Reverse Voltage

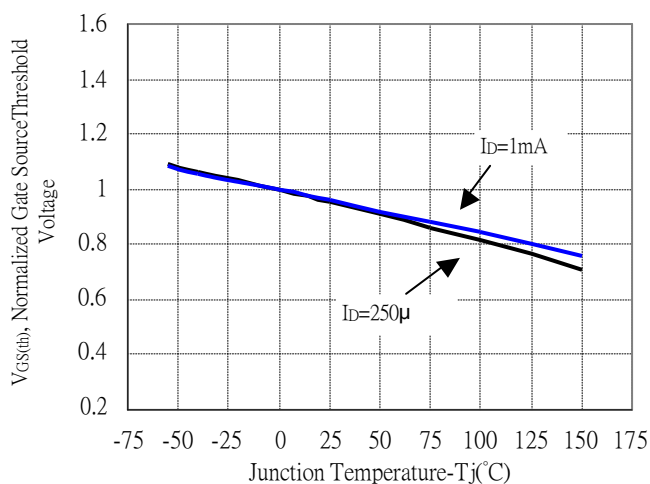


Typical Characteristics(Cont.)

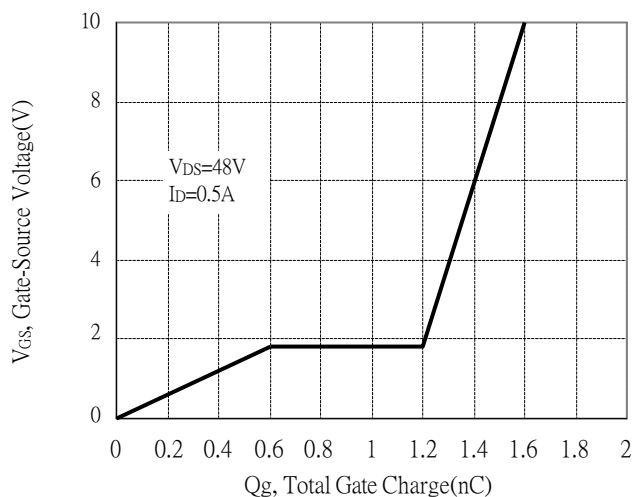
Maximum Safe Operating Area



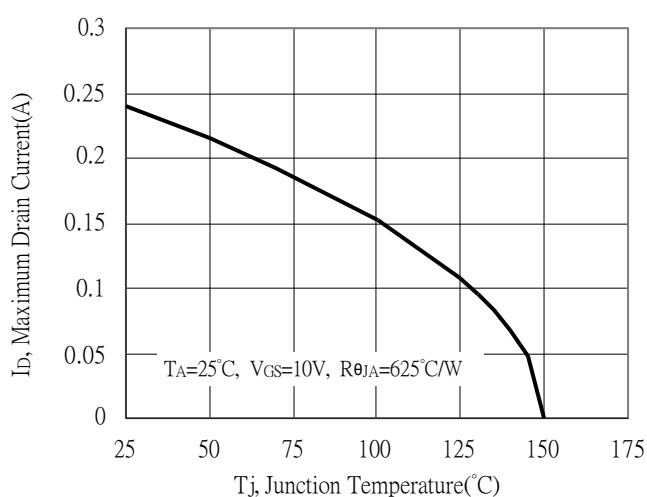
Gate Threshold Voltage vs Ambient Temperature



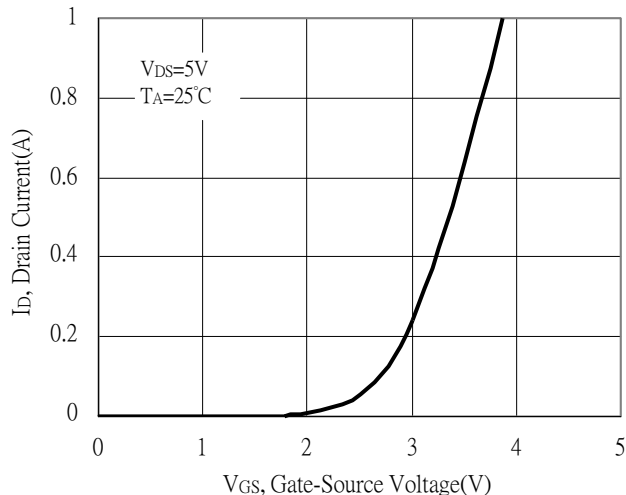
Gate Charge Characteristics



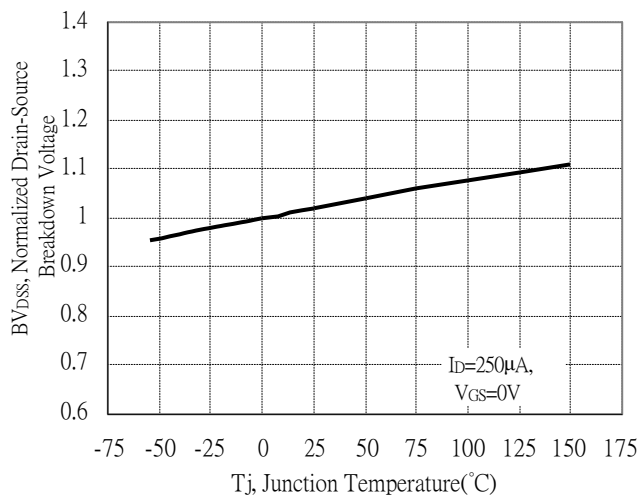
Maximum Drain Current vs Junction Temperature



Drain Current vs Gate-Source Voltage

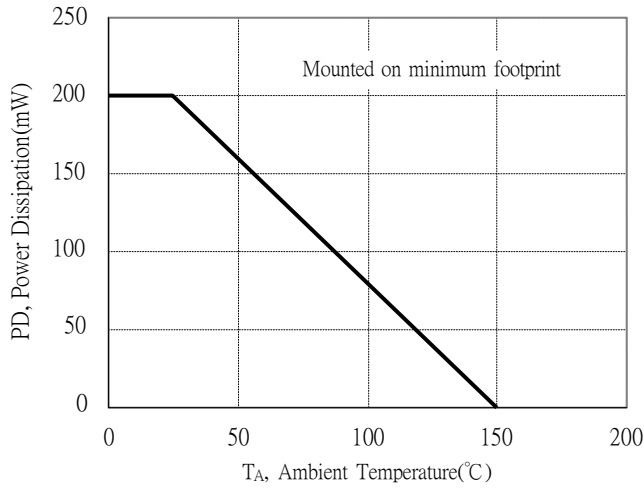


Breakdown Voltage vs Ambient Temperature

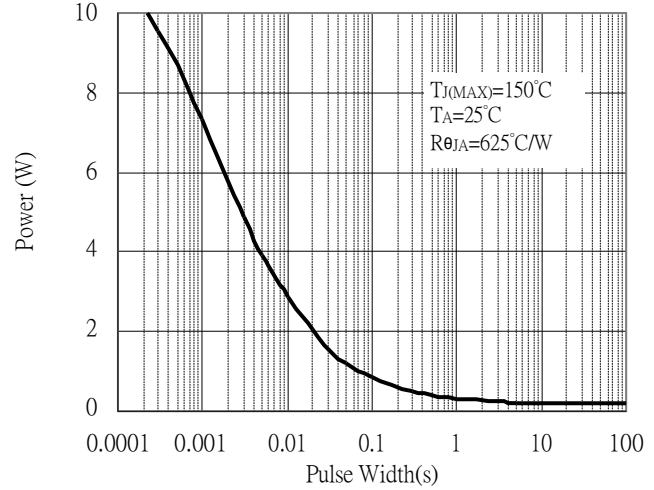


Typical Characteristics(Cont.)

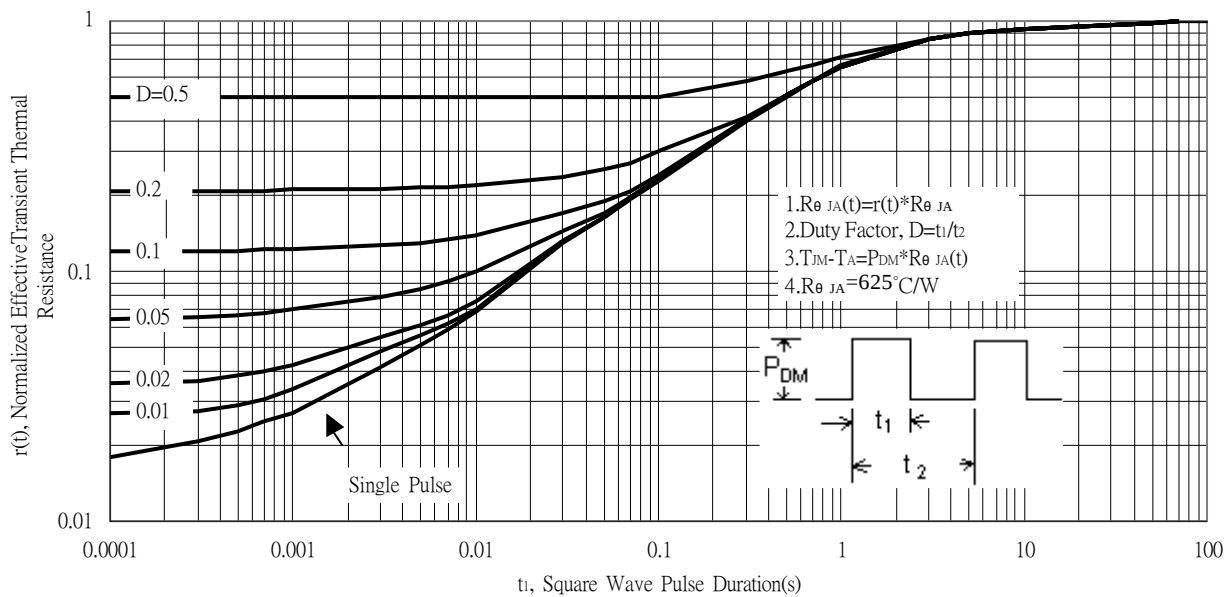
Power Derating Curve



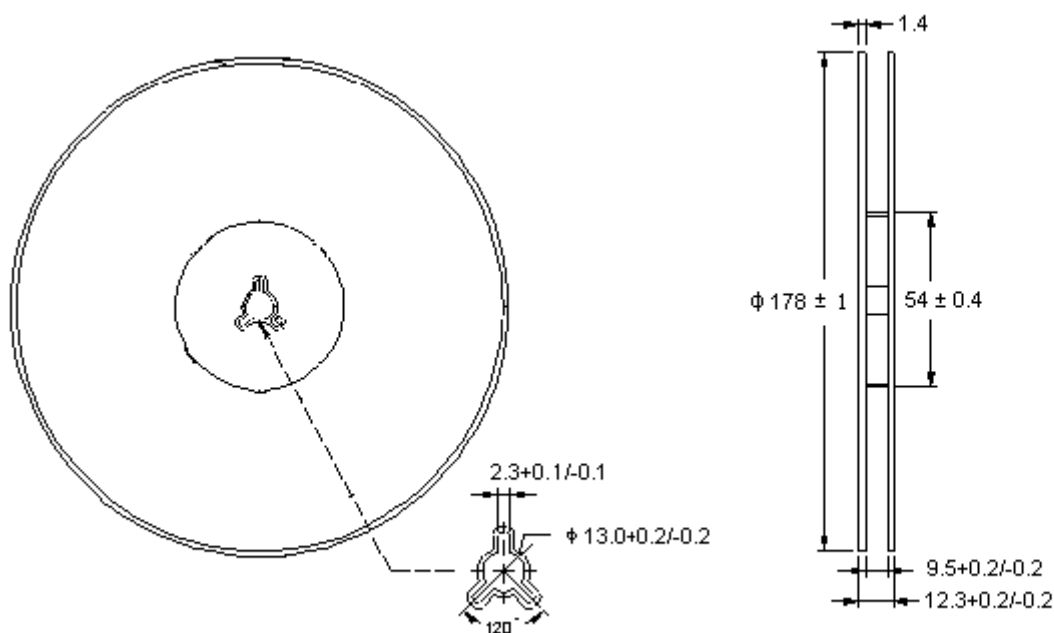
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

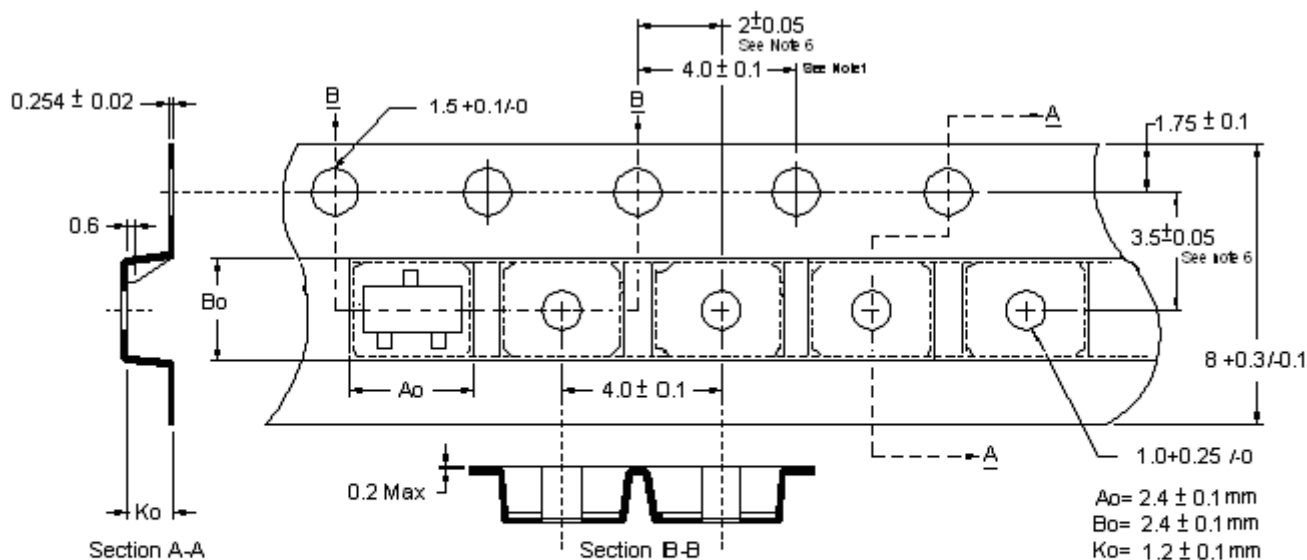


Reel Dimension



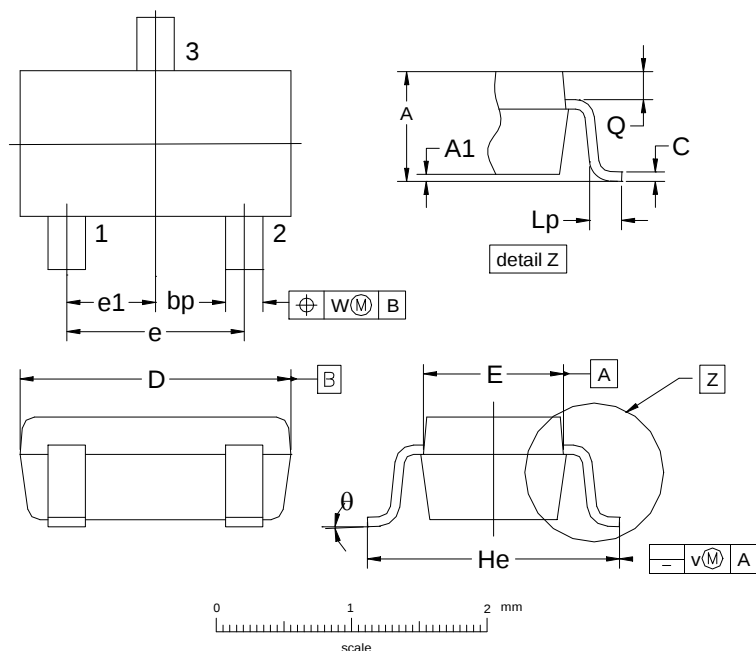
Unit: millimeter

Carrier Tape Dimension

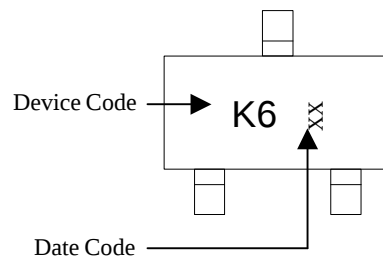


Unit : millimeter

SOT-323 Dimension



Marking:



3-Lead SOT-323 Plastic
 Surface Mounted Package
 Package Code: S3

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

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0315	0.0433	0.80	1.10	e1	0.0256	-	0.65	-
A1	0.0000	0.0039	0.00	0.10	He	0.0787	0.0886	2.00	2.25
bp	0.0118	0.0157	0.30	0.40	Lp	0.0059	0.0177	0.15	0.45
C	0.0039	0.0098	0.10	0.25	Q	0.0051	0.0091	0.13	0.23
D	0.0709	0.0866	1.80	2.20	v	0.0079	-	0.2	-
E	0.0453	0.0531	1.15	1.35	w	0.0079	-	0.2	-
e	0.0512	-	1.3	-	θ	-	-	10°	0°