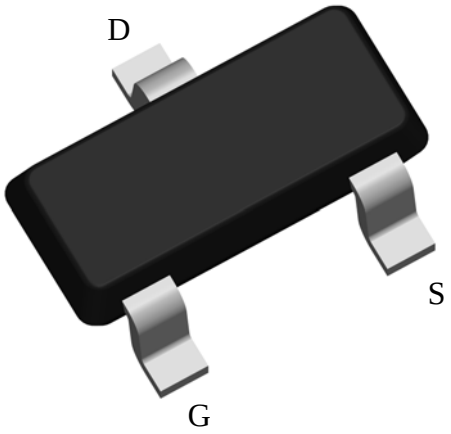
30V N-Channel Enhancement Mode MOSFET

Features:

- Simple drive requirement
- Small package outline
- ESD protected gate, **≥2kV (HBM)**
- Pb-free lead plating and halogen-free package

Outline

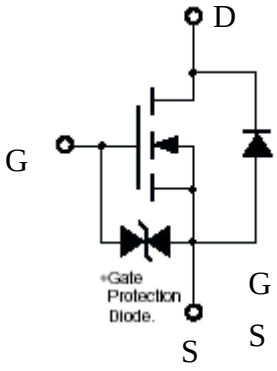
SOT-323



BV_{DSS}	30V
I_D@V_{GS}=10V, T_A=25°C	0.45A
$R_{DSON(MAX)}$@V_{GS}=10V, I_D=0.5A	0.39Ω (typ.)
$R_{DSON(MAX)}$@V_{GS}=4.5V, I_D=0.2A	0.45Ω (typ.)

Symbol

KWN8S3



G：Gate
S：Source
D：Drain

Ordering Information

Device	Package	Shipping
KWN8S3	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}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @V_{GS}=10V, T_A=25°C (Note 3)	I_D	0.45	A
Continuous Drain Current @V_{GS}=10V, T_A=70°C (Note 3)		0.36	
Pulsed Drain Current (Notes 1, 2)	I_{DM}	1.8	
ESD susceptibility (Note 4)	V_{ESD}	2000	V
Maximum Power Dissipation@ T_A=25℃ (Note 3)	P_D	0.2	W
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max (Note 3)	$R_{\theta JA}$	625	°C/W
Thermal Resistance, Junction-to-Case, max	$R_{\theta JC}$	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

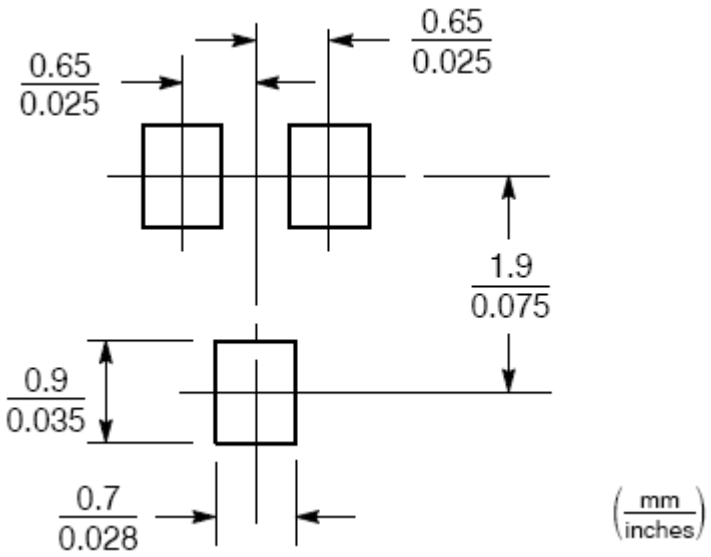
Electrical Characteristics (Tj=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.03	-	V/°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)
*$R_{DS(ON)}$	-	0.39	0.8	Ω	I_D=0.5A, V_{GS}=10V
	-	0.45	1		I_D=0.2A, V_{GS}=4.5V
*G_{FS}	-	0.34	-	S	V_{DS}=10V, I_D=0.1A
Dynamic					
Ciss	-	23	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	11	-		
Crss	-	3	-		
$t_{d(ON)}$	-	2.8	-	ns	V_{DS}=15V, I_D=0.5A, V_{GS}=10V, R_G=1Ω
t_r	-	15.4	-		
$t_{d(OFF)}$	-	9.8	-		
t_f	-	6.6	-		

Qg	-	1.7	-	nC	V_{DS}=15V, I_D=0.5A, V_{GS}=10V
Qgs	-	0.7	-		
Qgd	-	0.5	-		
Source-Drain Diode					
I_S	-	-	0.45	A	
I_{SM}	-	-	1.8		
*V_{SD}	-	0.84	1.2	V	V_{GS}=0V, I_S=0.3A
*trr	-	5	-	ns	I_F=0.5A, dI_F/dt=100A/μs
*Qrr	-	1.2	-	nC	

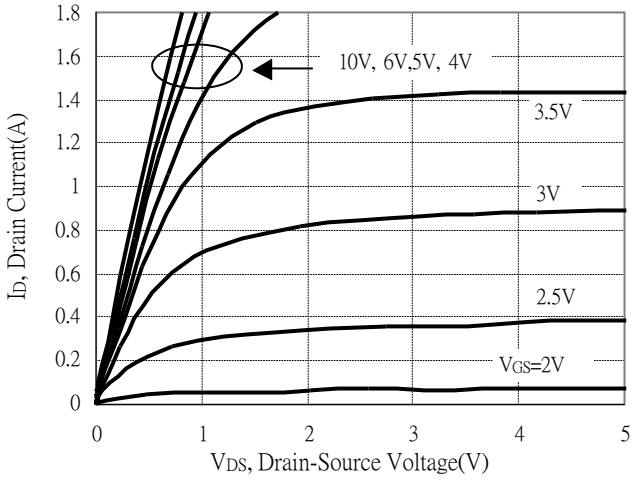
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

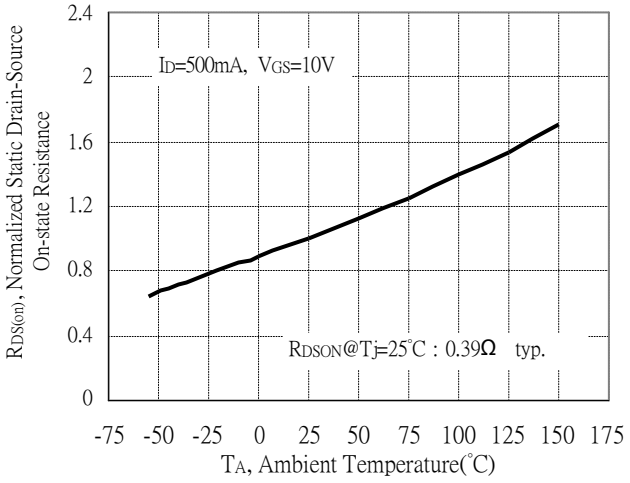


Typical Characteristics

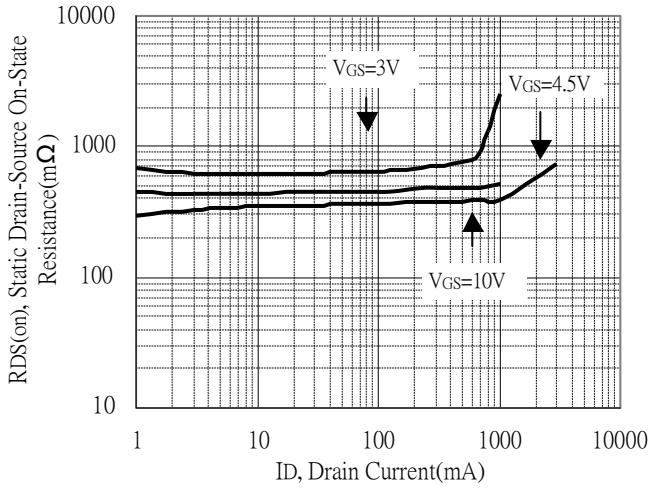
Typical Output Characteristics



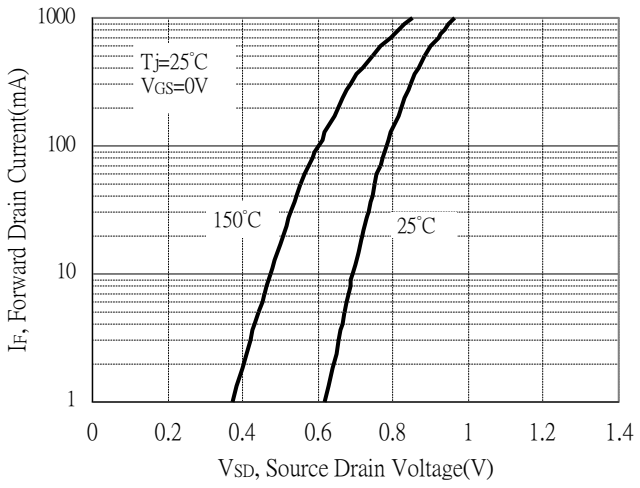
Static Drain-Source On-resistance vs Ambient Temperature



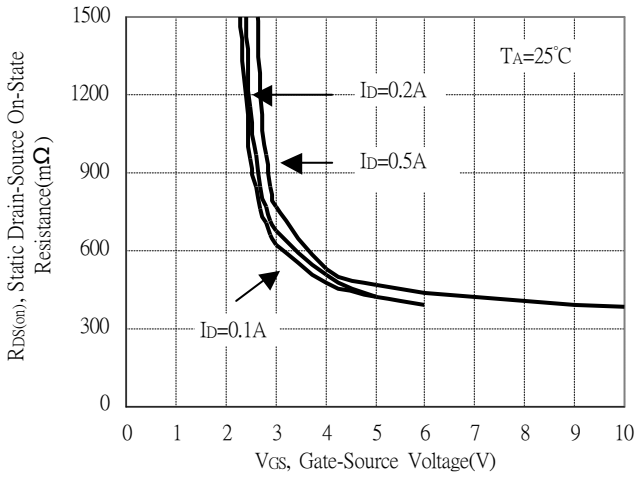
Static Drain-Source On-State resistance vs Drain Current



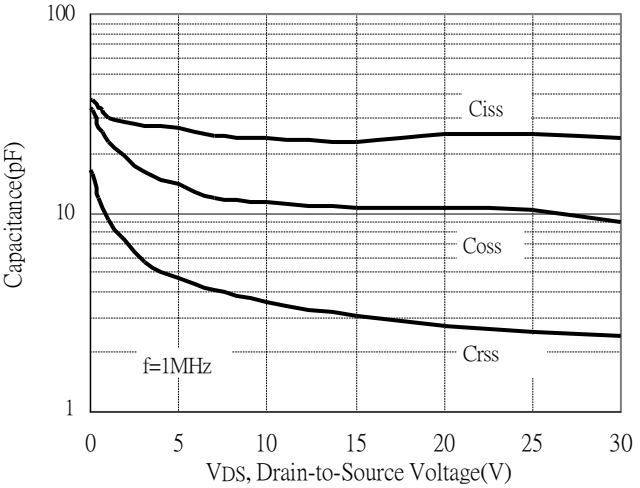
Forward Drain Current vs Source-Drain Voltage



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

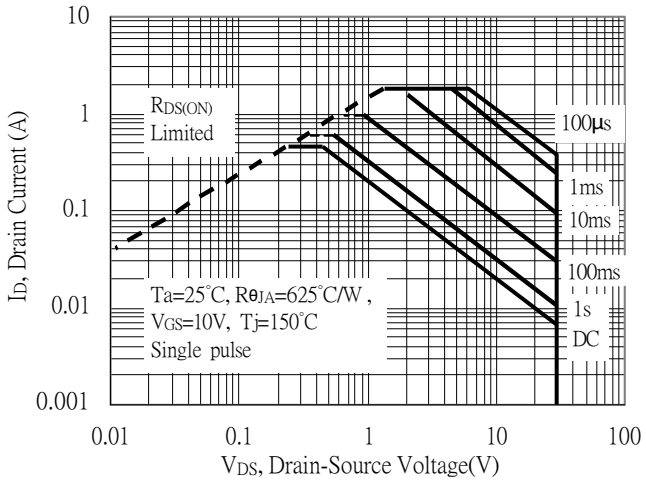


Capacitance vs Reverse Voltage

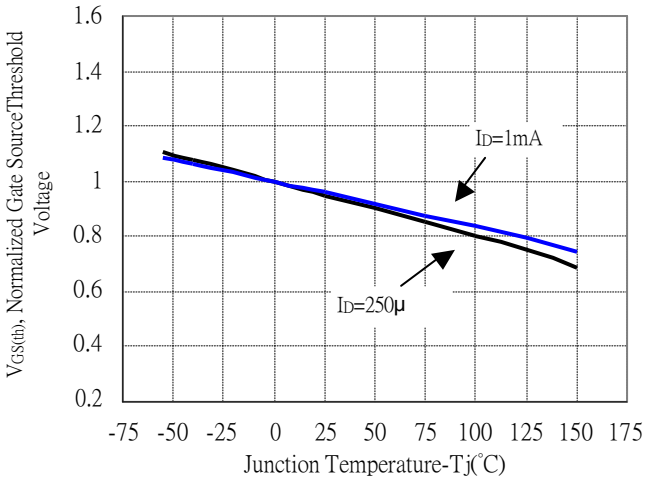


Typical Characteristics(Cont.)

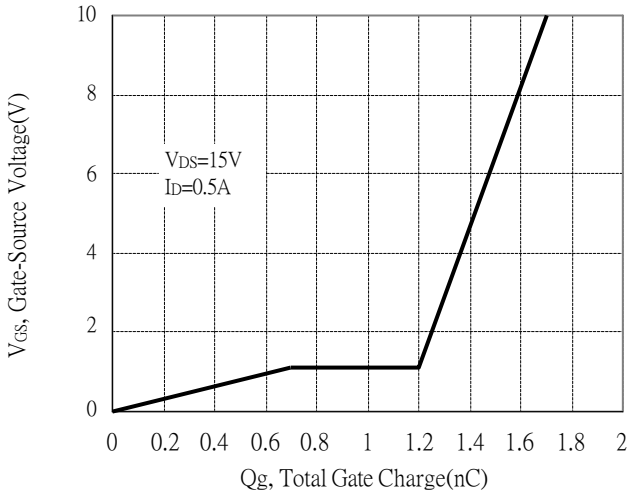
Maximum Safe Operating Area



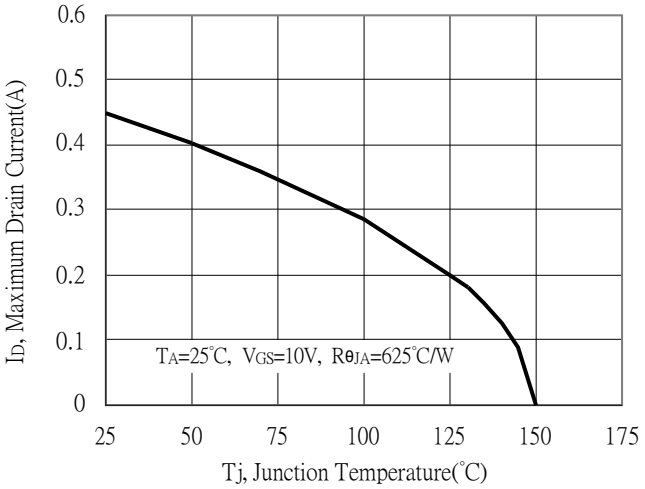
Gate Threshold Voltage vs Ambient Temperature



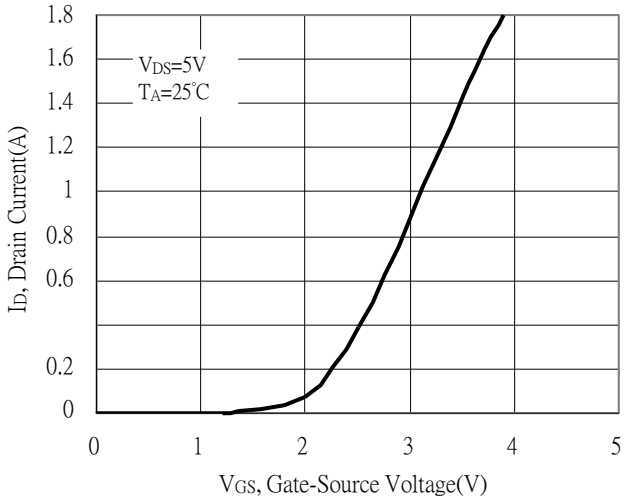
Gate Charge Characteristics



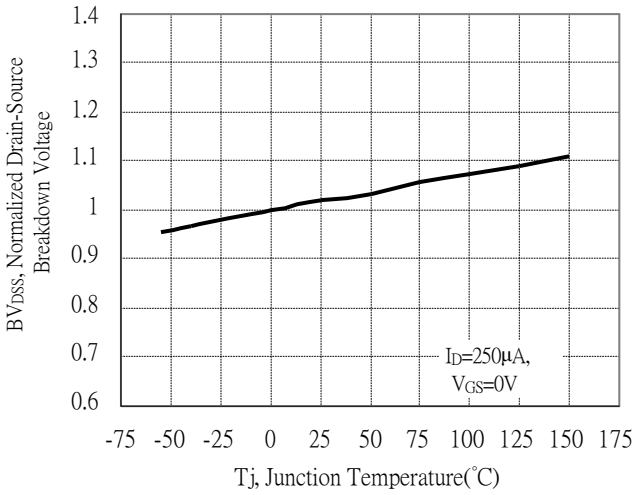
Maximum Drain Current vs Junction Temperature



Drain Current vs Gate-Source Voltage

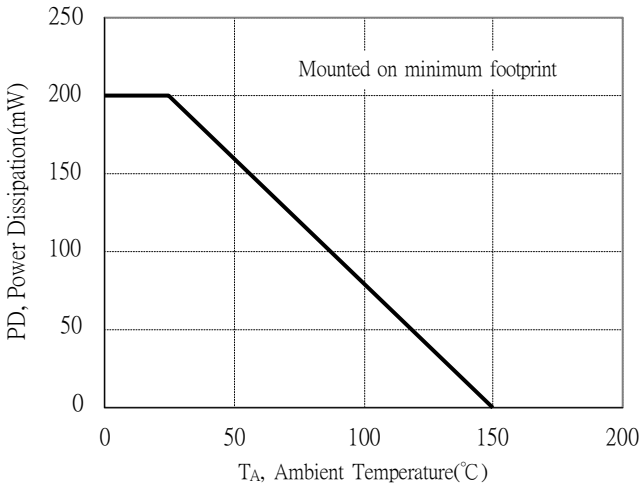


Brekdown Voltage vs Ambient Temperature

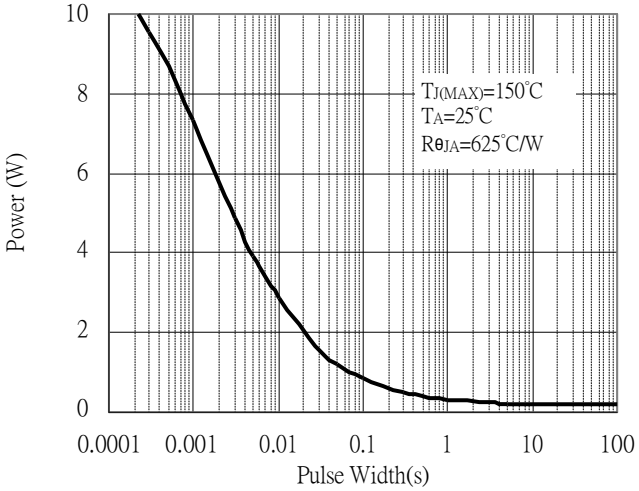


Typical Characteristics(Cont.)

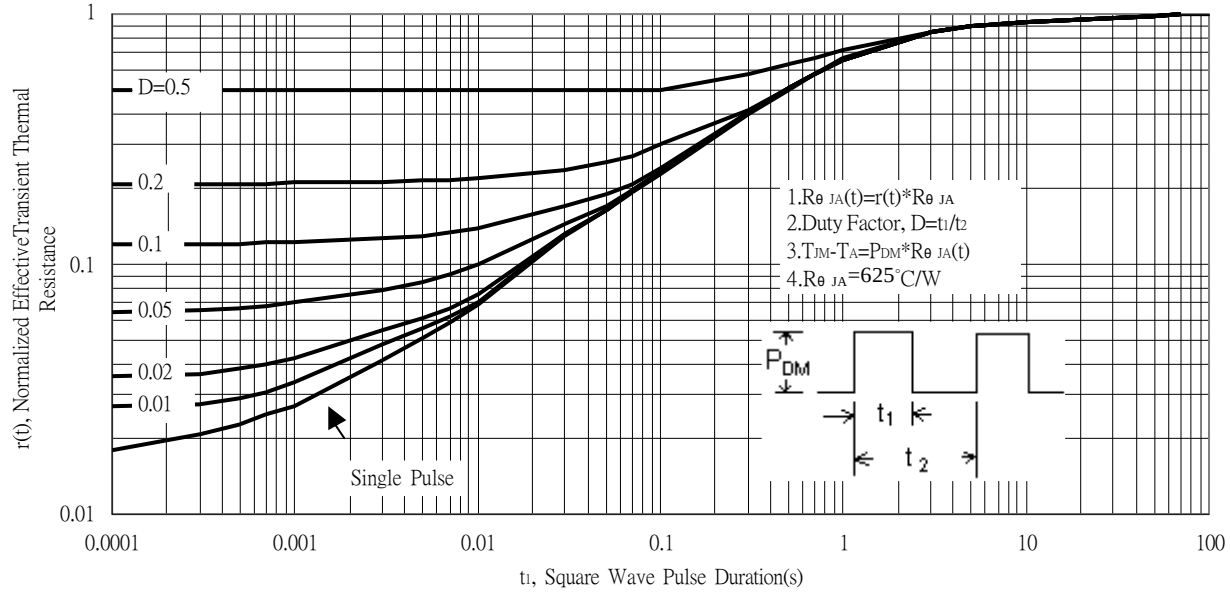
Power Derating Curve



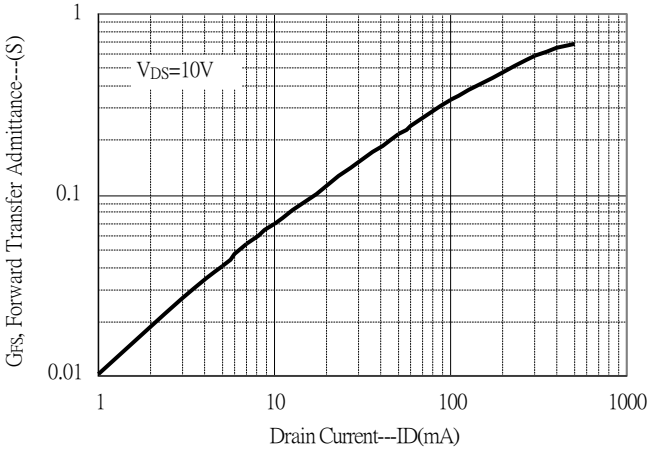
Single Pulse Power Rating, Junction to Ambient



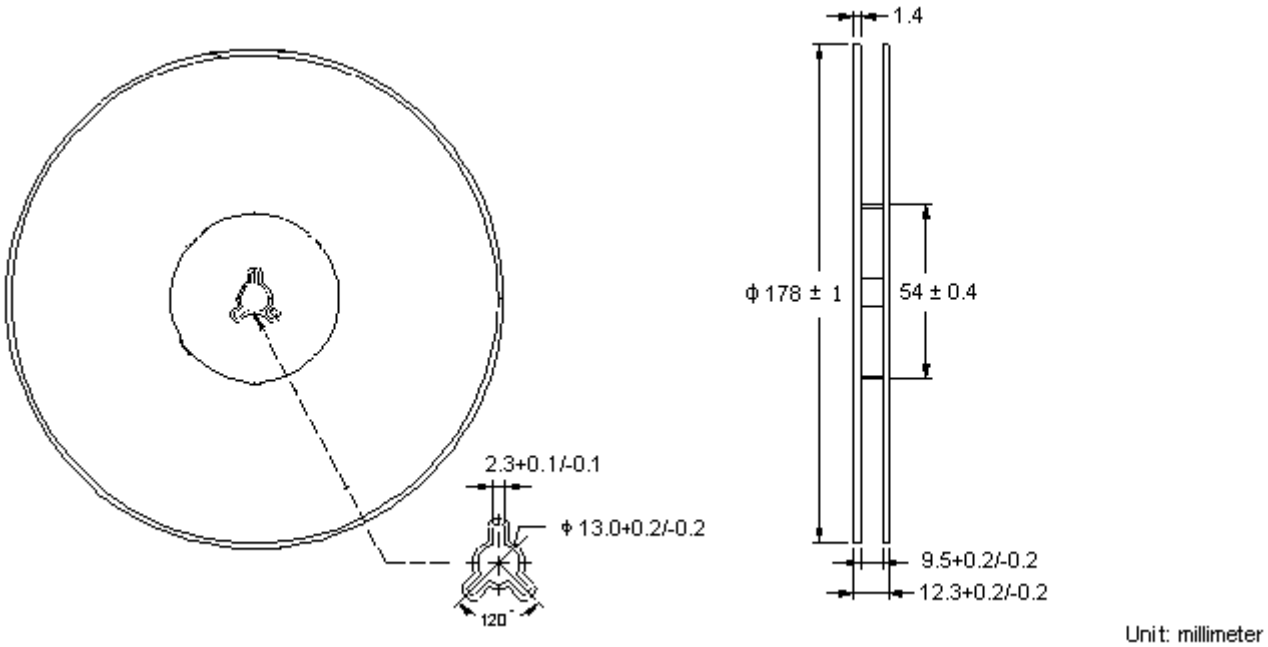
Transient Thermal Response Curves



Forward Transfer Admittance vs Drain Current

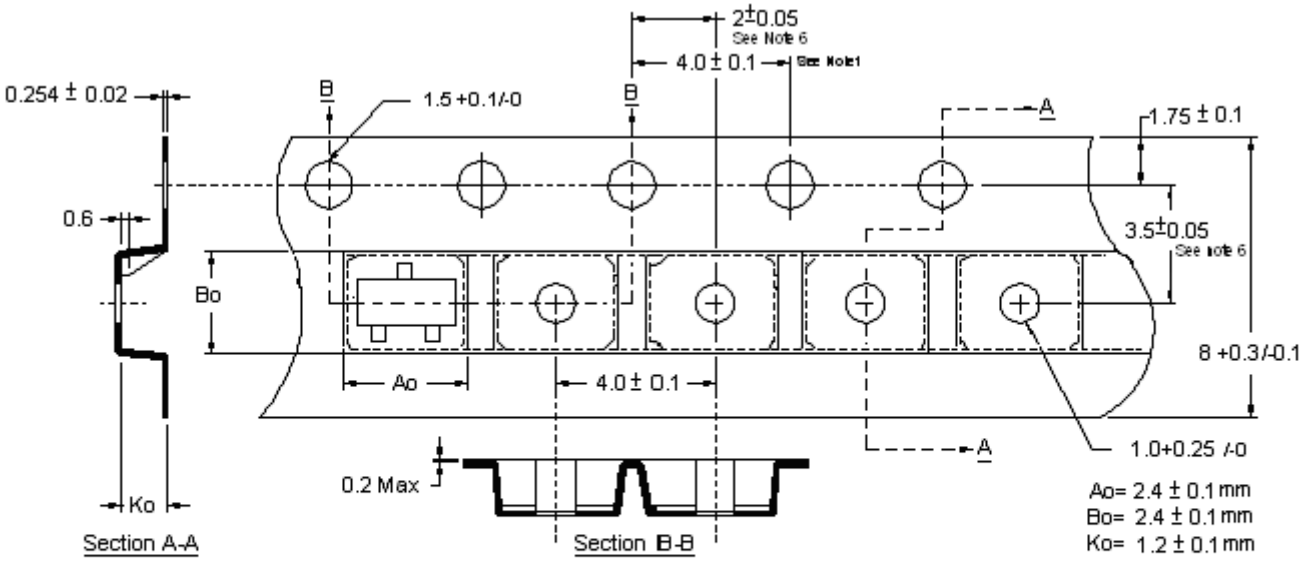


Reel Dimension



Unit: millimeter

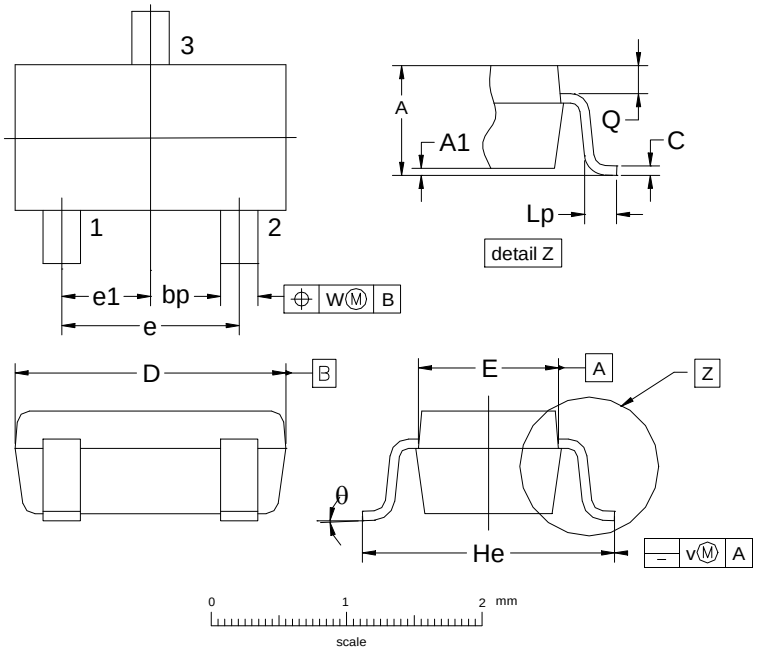
Carrier Tape Dimension



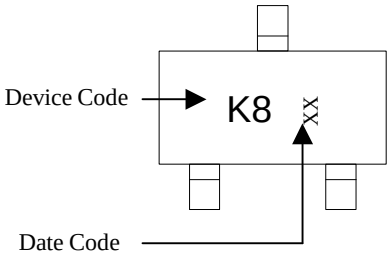
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : Condutive black polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

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°