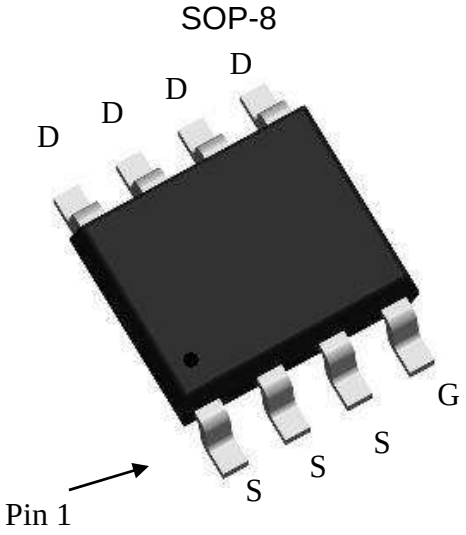
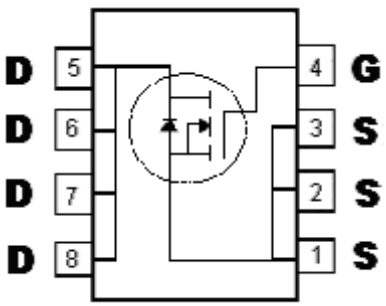
N-Channel Enhancement Mode Power MOSFET

Features:

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Pb-free & Halogen-free package



BV_{DSS}	**100V**
I_D @ T_A=25°C, V_{GS}=10V	**8.1A**
$R_{DS(ON)}$@V_{GS}=10V, I_D=10A	**20.7 mΩ(typ)**
$R_{DS(ON)}$@V_{GS}=4.5V, I_D=8A	**25.7 mΩ(typ)**



G：Gate D：Drain S：Source

Ordering Information

Device	Package	Shipping
KSCB020N10R	SOP-8 (RoHS compliant & Halogen-free package)	4000 pcs / Tape & Reel

Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ T_A=25°C, V_{GS}=10V		I_D	8.1	A
Continuous Drain Current @ T_A=70°C, V_{GS}=10V			6.5	
Pulsed Drain Current		I_{DM}	45 *1	
Avalanche Current @ L=0.1mH		I_{AS}	36	
Avalanche Energy @ L=1mH, I_D=12A, V_{DD}=25V		E_{AS}	72 *3	mJ
Repetitive Avalanche Energy @ L=0.05mH		E_{AR}	1.6 *2	
Total Power Dissipation	T_A=25 °C	P_D	3.1	W
	T_A=70 °C		2.0	
Operating Junction and Storage Temperature		Tj, Tstg	-55~+150	°C

Note : *1. Pulse width limited by maximum junction temperature
*2. Duty cycle ≤ 1%
*3. 100% tested by conditions of L=0.1mH, I_{AS}=10A, V_{GS}=10V, V_{DD}=25V

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case	$R_{\theta JC}$	20	°C/W
Thermal Resistance, Junction-to-ambient (Note)	$R_{\theta JA}$	40	

Note : 40℃ / W when mounted on a 1 in^2 pad of 2 oz copper, t≤10s; 125 ˚C/W when mounted on minimum pad.

Characteristics (Tc=25°C, unless otherwise specified)

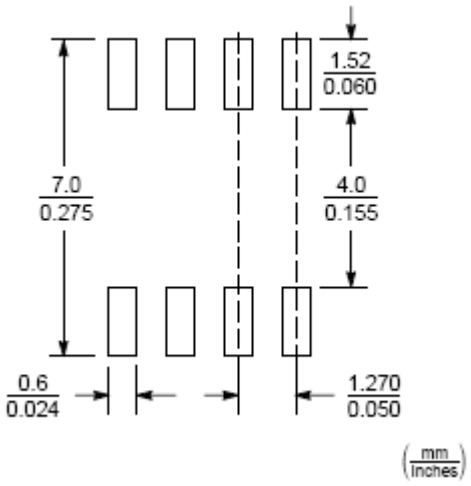
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1	-	2.5		V_{DS} = V_{GS}, I_D=250μA
G_{FS}	-	12	-	S	V_{DS} =10V, I_D=5A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =80V, V_{GS} =0V
	-	-	25		V_{DS} =80V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	20.7	28	mΩ	V_{GS} =10V, I_D=10A
	-	25.7	37		V_{GS} =4.5V, I_D=8A
Dynamic					
Qg *1, 2	-	21.3	-	nC	V_{DS}=80V, V_{GS}=10V, I_D=10A
Qgs *1, 2	-	4	-		
Qgd *1, 2	-	3.9	-		
Ciss	-	1285	-	pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
Coss	-	108	-		
Crss	-	24	-		

Characteristics (Cont. T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
$t_{d(ON)}$ *1, 2	-	10.2	-	ns	V_{DS}=50V, I_D=10A, V_{GS}=10V, R_{GS}=1Ω
tr *1, 2	-	7.2	-		
$t_{d(OFF)}$ *1, 2	-	29.4	-		
t_f *1, 2	-	7.2	-		
Rg	-	1.3	-	Ω	f=1MHz
Source-Drain Diode Ratings and Characteristics					
I_S *1	-	-	8.1	A	
I_{SM} *3	-	-	45		
V_{SD} *1	-	0.87	1.2	V	I_S=10A, V_{GS}=0V
trr	-	29.1	-	ns	I_F=10A, dI_F/dt=100A/μs
Qrr	-	36.5	-	nC	

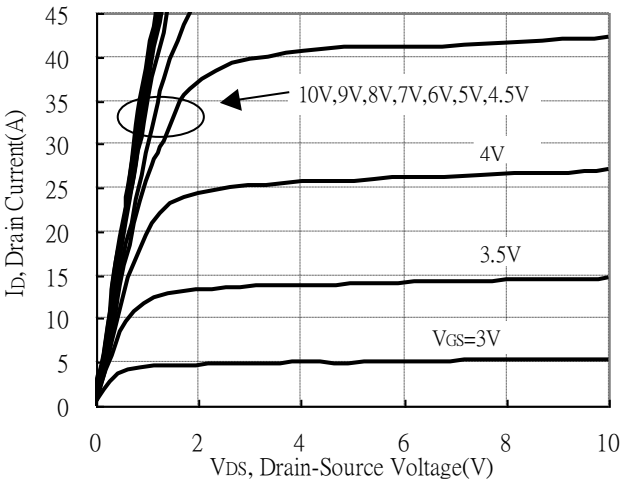
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Recommended Soldering Footprint

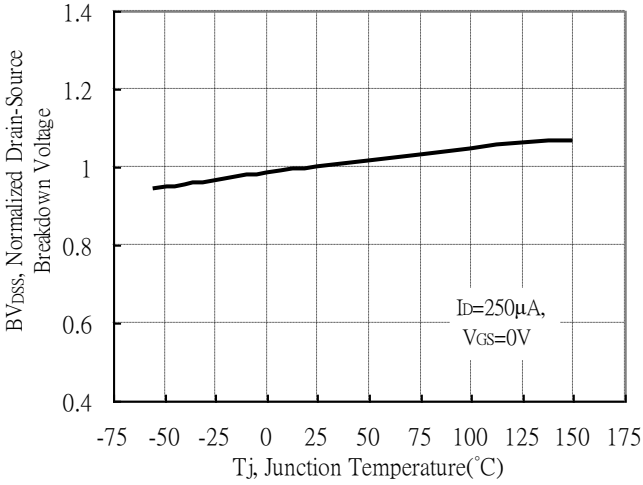


Typical Characteristics

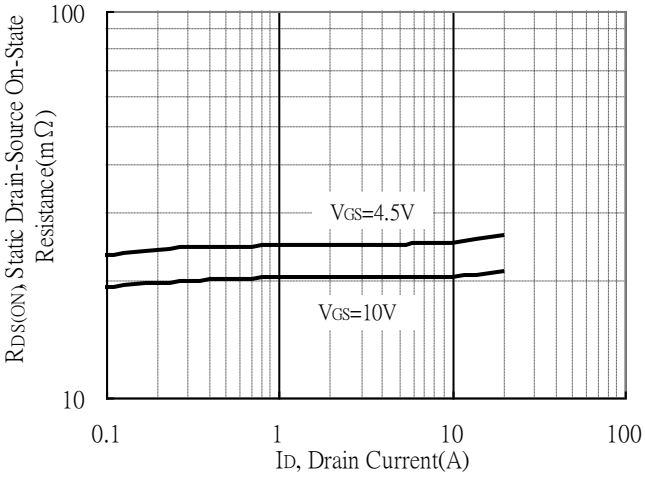
Typical Output Characteristics



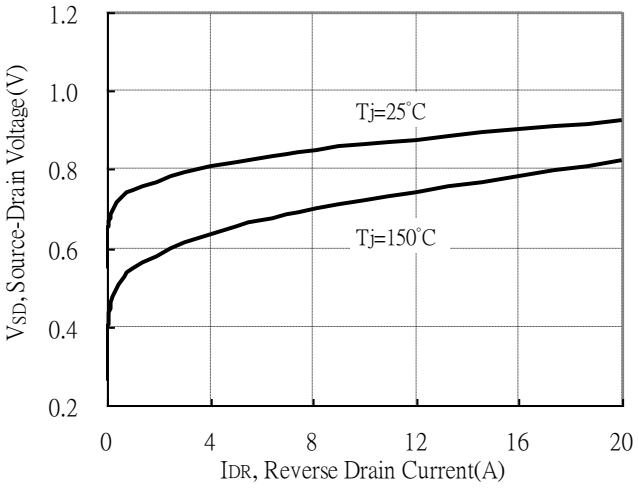
Brekdown Voltage vs Ambient Temperature



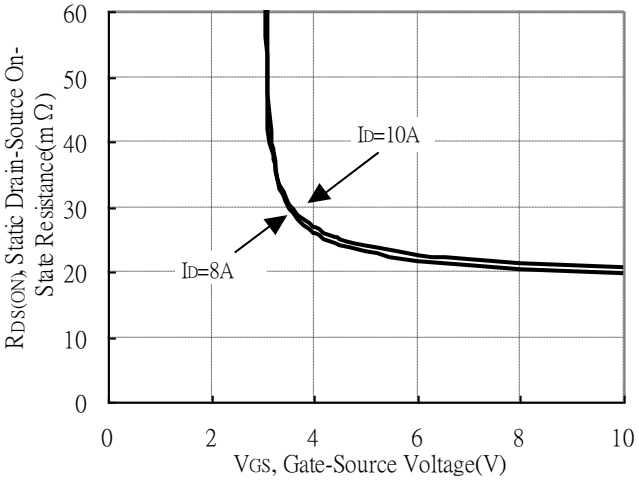
Static Drain-Source On-State resistance vs Drain Current



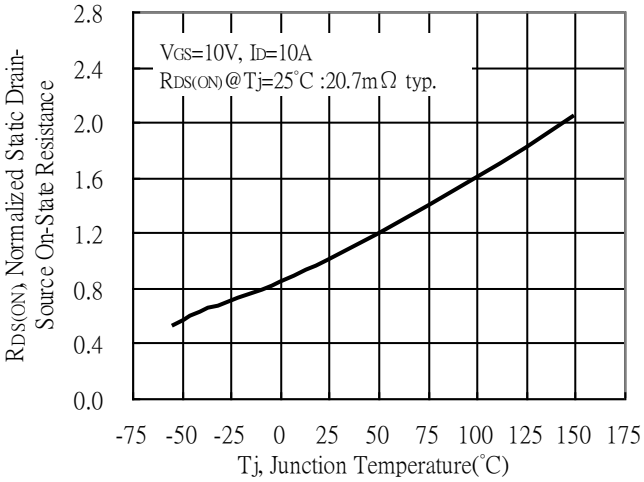
Reverse Drain Current vs Source-Drain Voltage



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

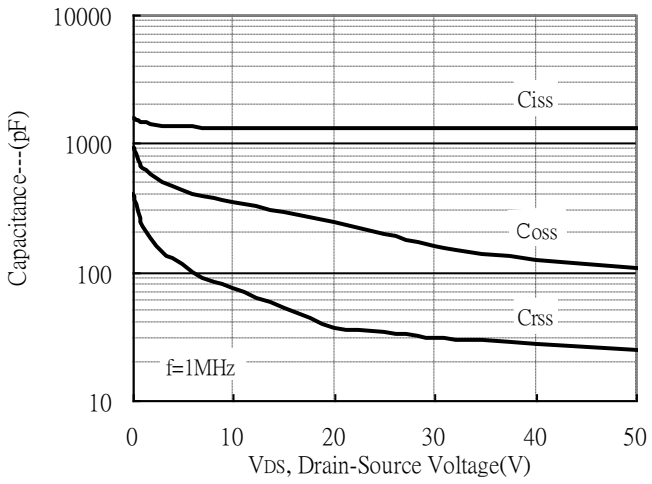


Drain-Source On-State Resistance vs Junction Tempearture

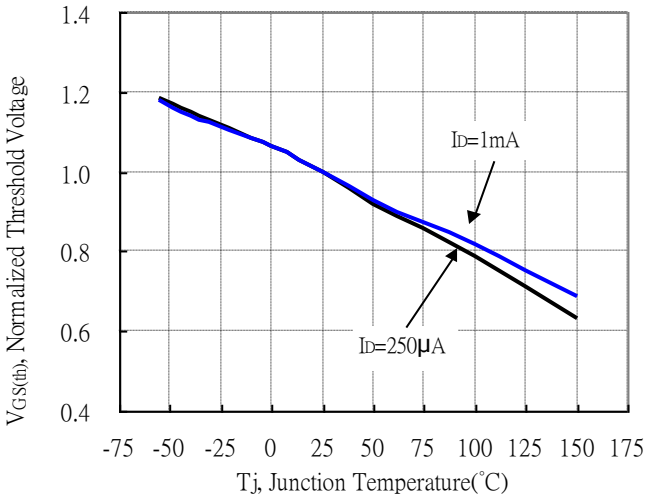


Typical Characteristics(Cont.)

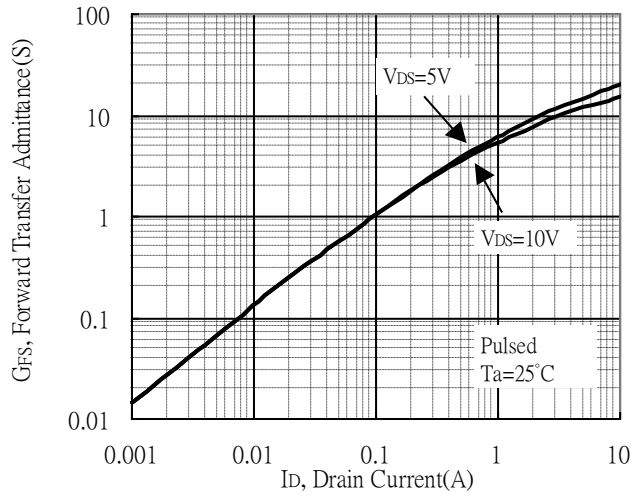
Capacitance vs Drain-to-Source Voltage



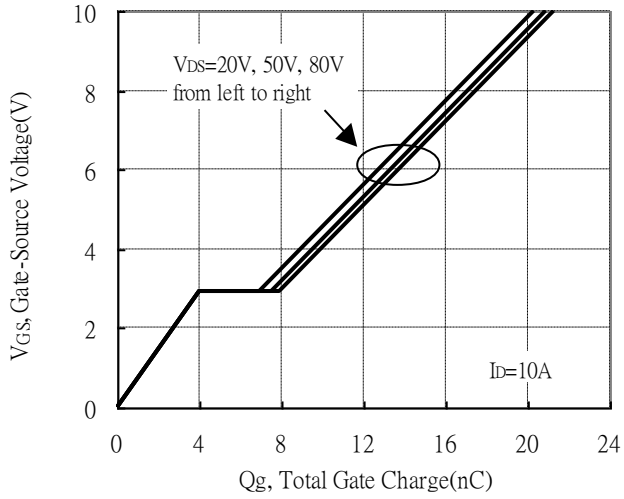
Threshold Voltage vs Junction Tempearture



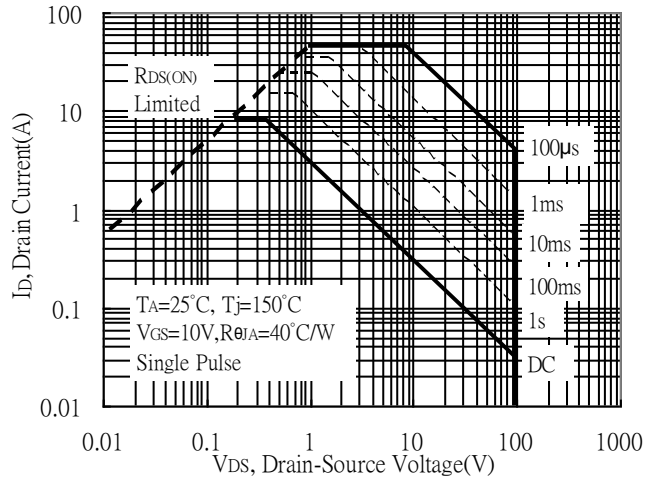
Forward Transfer Admittance vs Drain Current



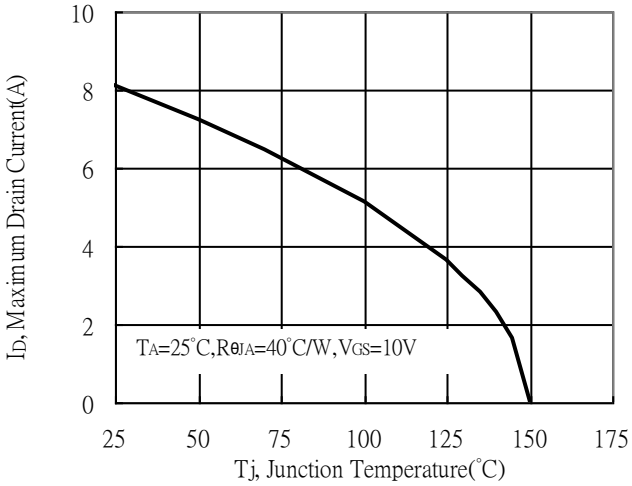
Gate Charge Characteristics



Maximum Safe Operating Area

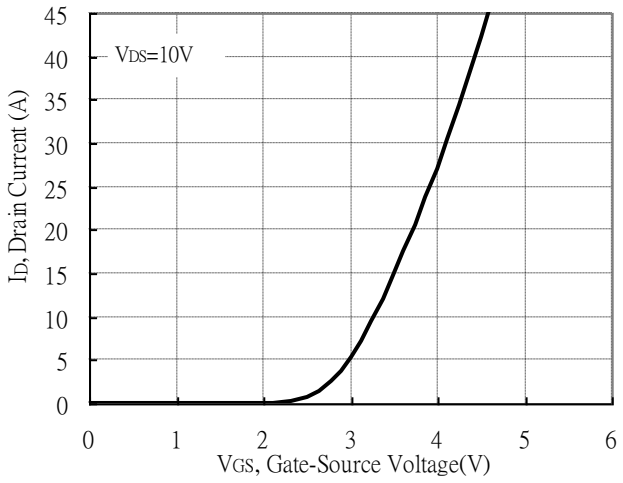


Maximum Drain Current vs Junction Temperature

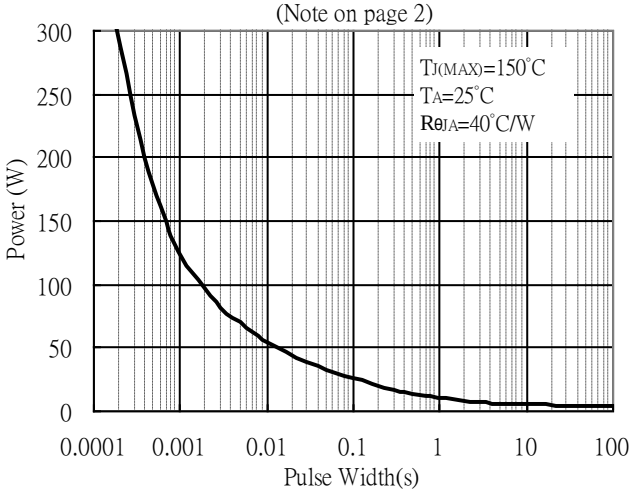


Typical Characteristics(Cont.)

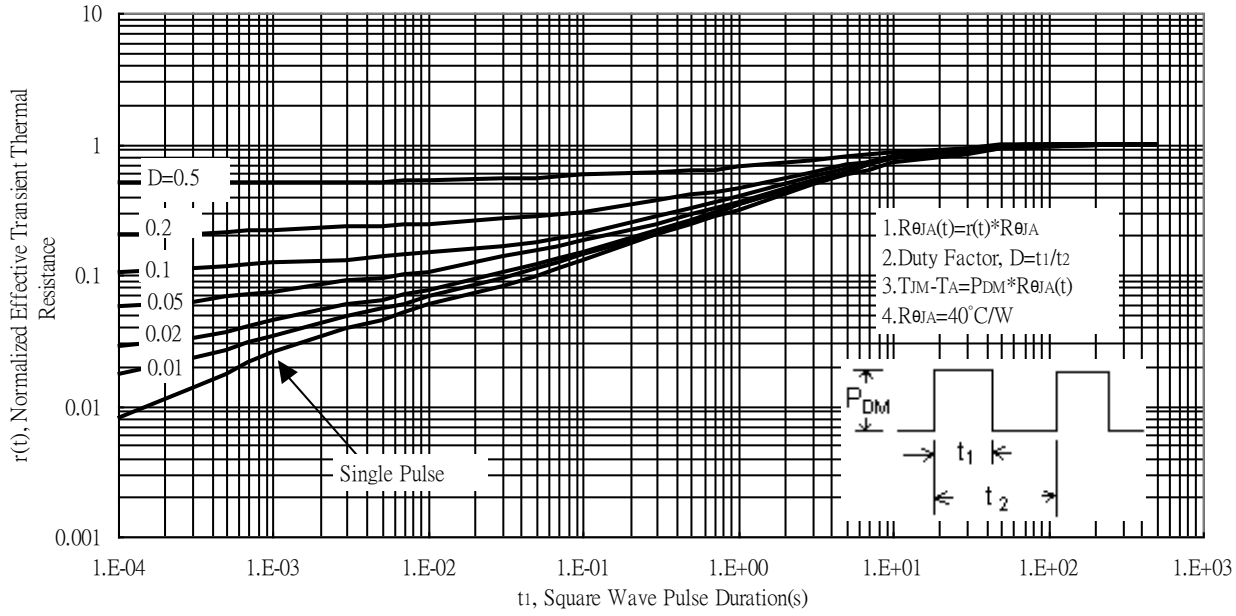
Typical Transfer Characteristics



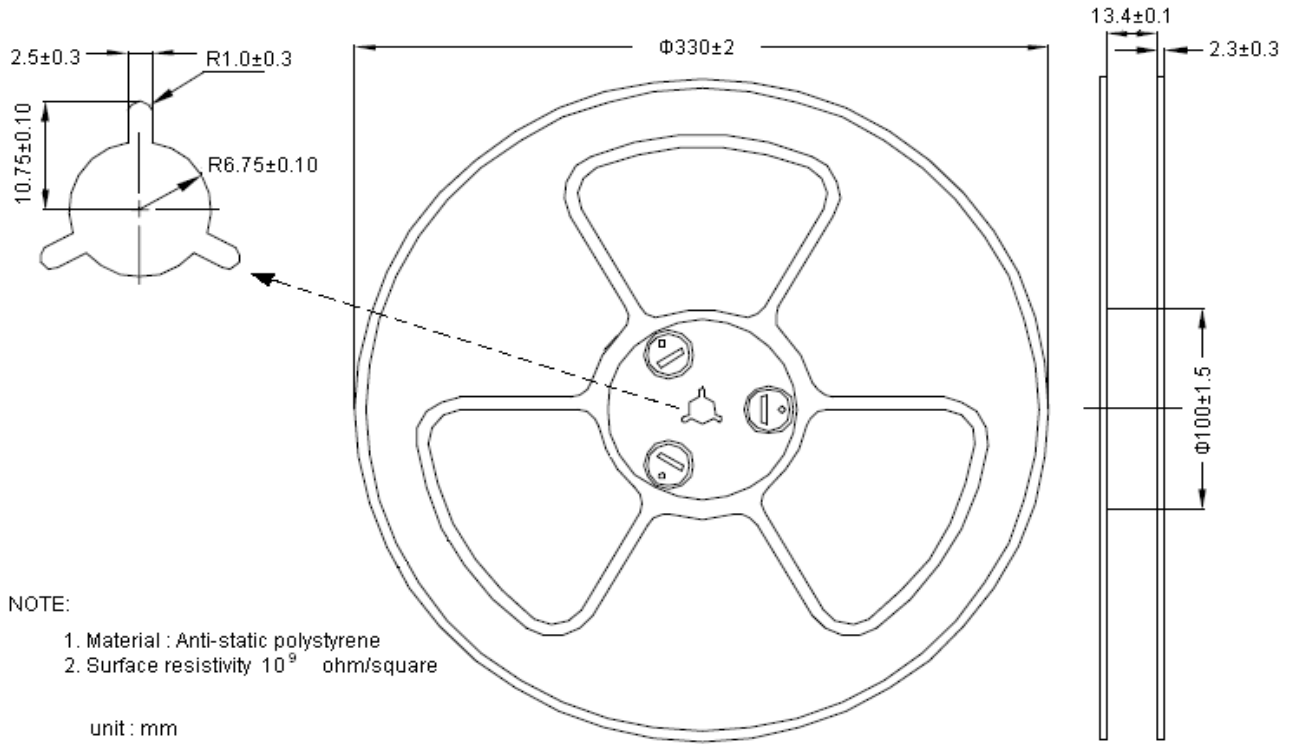
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



Transient Thermal Response Curves



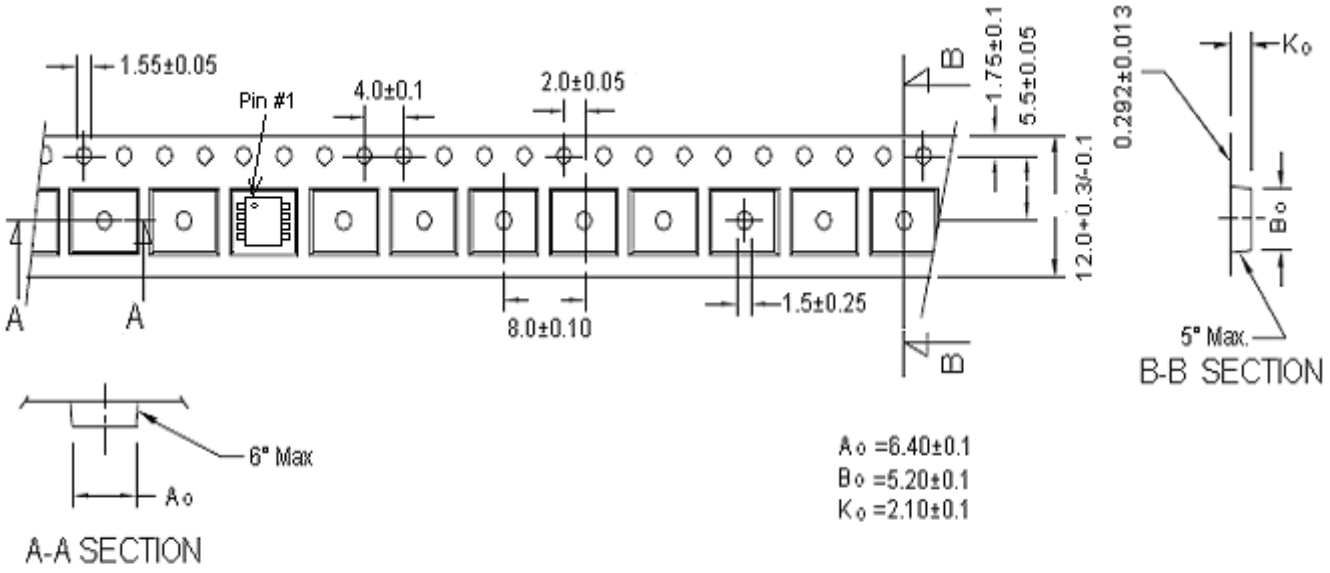
Reel Dimension



NOTE:
1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 ohm/square

unit : mm

Carrier Tape Dimension

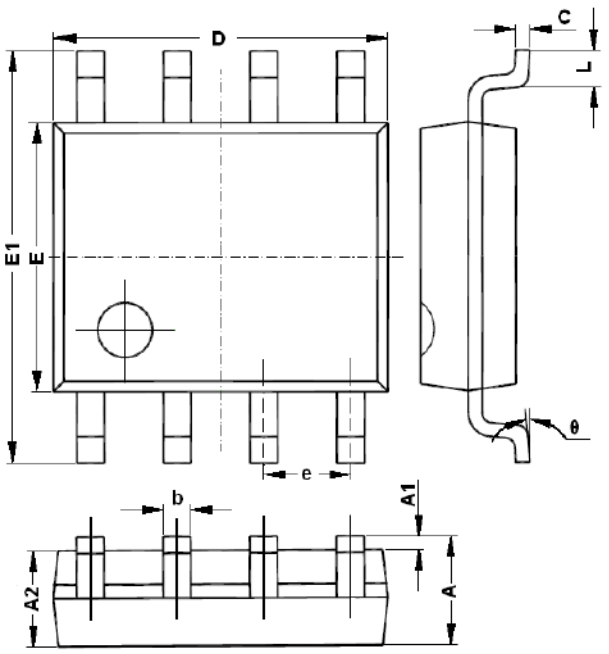


Ao =6.40±0.1
Bo =5.20±0.1
Ko =2.10±0.1

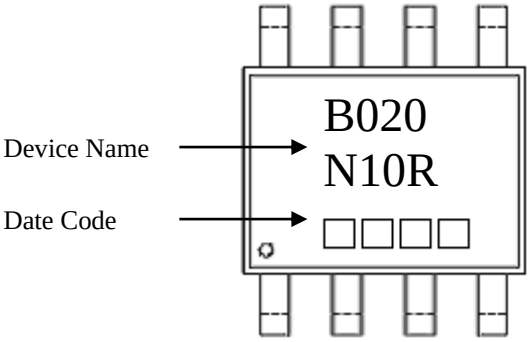
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

Uni : millimeter

SOP-8 Dimension



Marking:



Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D
May→E, Jun→F, Jul→G, Aug→H, Sep→J,
Oct→K, Nov→L, Dec→M
3rd and 4th codes : production serial number, 01~99

8-Lead SOP-8 Plastic Package

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	θ	0	8°	0	8°
D	4.700	5.100	0.185	0.200					