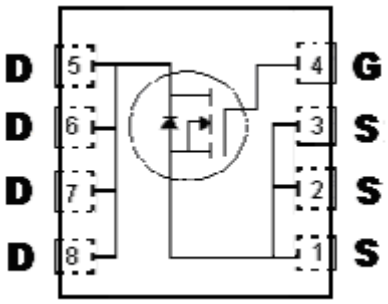
N-Channel Enhancement Mode Power MOSFET

Features:

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free package

DFN3×3

BV_{DSS}		60V
I_D @ T_C=25°C, V_{GS}=10V		48A
I_D @ T_A=25°C, V_{GS}=10V		12.7A
$R_{DSON(TYP)}$	V_{GS}=10V, I_D=20A	5.6mΩ
	V_{GS}=4.5V, I_D=10A	9.3mΩ



G：Gate　D：Drain　S：Source

Ordering Information

Device	Package	Shipping
KSPRB7D0N06R	DFN3×3 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C		I_D	48	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C			30.4	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C		I_{DSM}	12.7	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C			10.2	
Pulsed Drain Current		I_{DM}	192 *1	
Avalanche Current @ L=0.1mH		I_{AS}	48	
Avalanche Energy @ L=1mH, I_D=20A, V_{DD}=25V		E_{AS}	200	mJ
Total Power Dissipation	T_C=25℃	P_D	36	W
	T_C=100℃		14	
	T_A=25℃	P_{DSM}	2.5 *2	
	T_A=70℃		1.6 *2	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	3.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	50 *2	

Note : 1. Pulse width limited by maximum junction temperature.
2. Surface mounted on a 1 in² pad of 2oz copper, t≤10s. In practice $R_{\theta JA}$ will be determined by customer's PCB characteristics. 125°C/W when mounted on a minimum pad of 2 oz. copper.
3. 100% tested by conditions of L=0.1mH, I_{AS}=20A, V_{GS}=10V, V_{DD}=25V

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

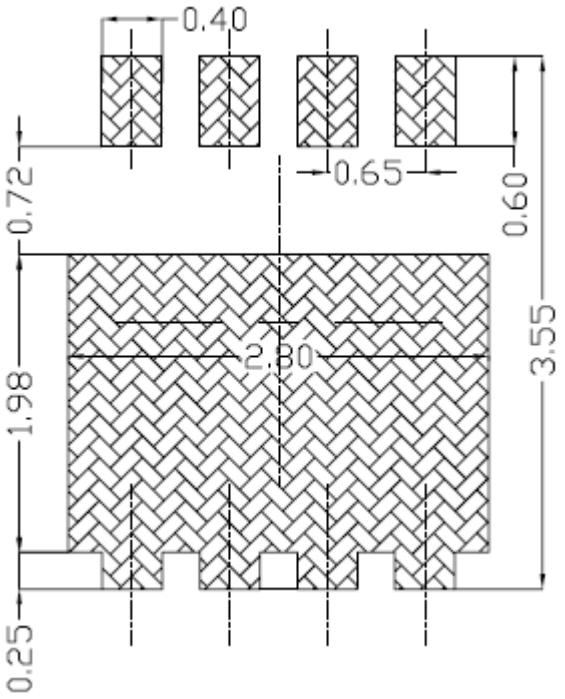
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1	-	2.5		V_{DS} = V_{GS}, I_D=250μA
G_{FS} *1	-	21.3	-	S	V_{DS} =5V, I_D=10A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =48V, V_{GS} =0V
	-	-	5		V_{DS} =48V, V_{GS} =0V, Tj=55°C
$R_{DS(ON)}$ *1	-	5.6	7.5	mΩ	V_{GS} =10V, I_D=20A
	-	9.3	15		V_{GS} =4.5V, I_D=16A
Dynamic					
Ciss	-	2751	-	pF	V_{DS}=30V, V_{GS}=0V, f=1MHz
Coss	-	358	-		
Crss	-	41	-		
Qg *1, 2	-	46.9	-	nC	V_{DS}=48V, V_{GS}=10V, I_D=20A
Qgs *1, 2	-	9.5	-		
Qgd *1, 2	-	9.6	-		

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$ *1, 2	-	17.6	-	ns	V_{DS}=30V, I_D=20A, V_{GS}=10V, R_{GS}=3Ω
tr *1, 2	-	17.4	-		
$t_{d(OFF)}$ *1, 2	-	54.6	-		
t_f *1, 2	-	10	-		
Rg	-	1.8	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	30	A	
V_{SD} *1	-	0.87	1.2	V	I_S=20A, V_{GS}=0V
trr	-	23.5	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	18.5	-	nC	

Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature

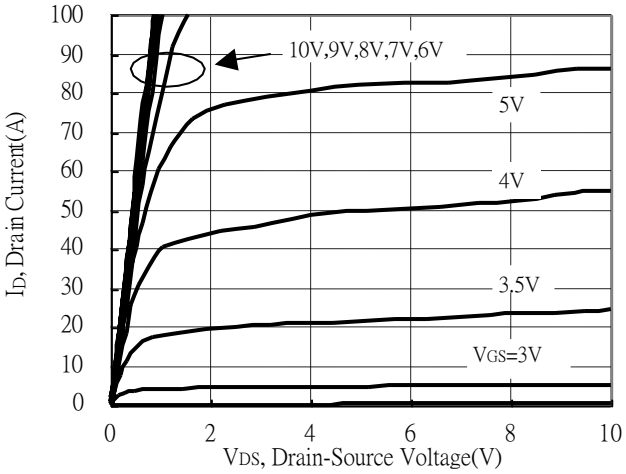
Recommended Soldering Footprint



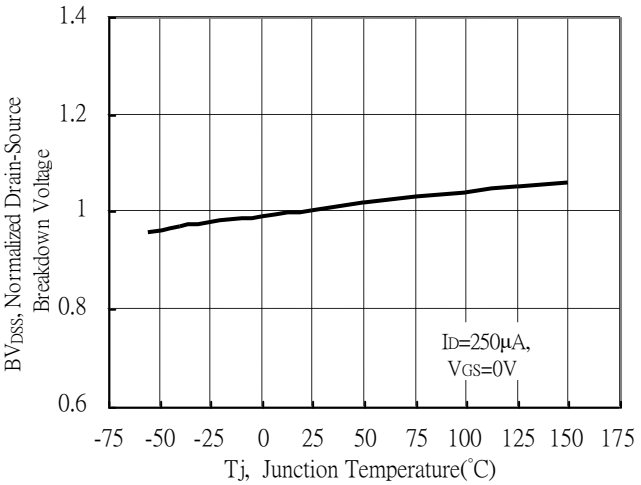
unit : mm

Typical Characteristics

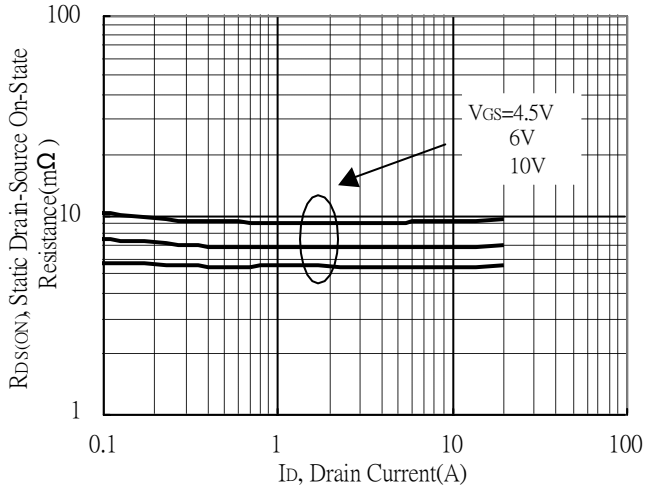
Typical Output Characteristics



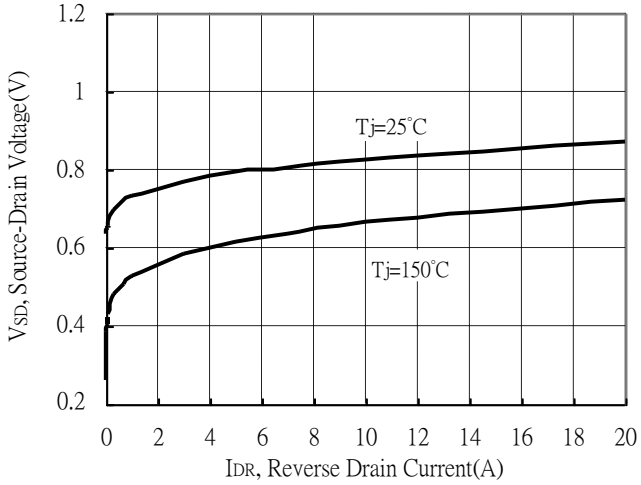
Brekdown Voltage vs Ambient Temperature



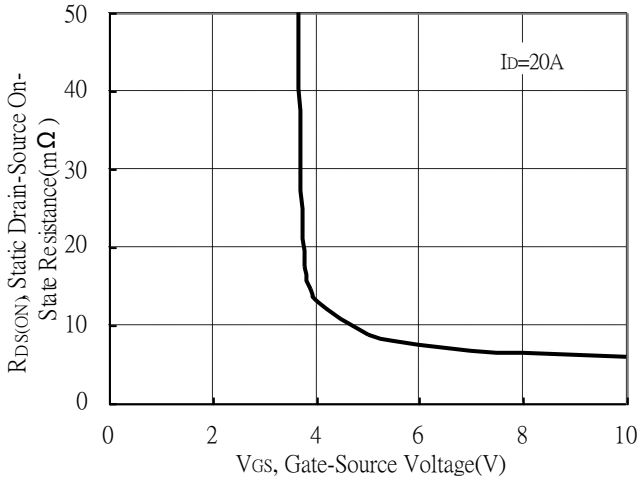
Static Drain-Source On-State resistance vs Drain Current



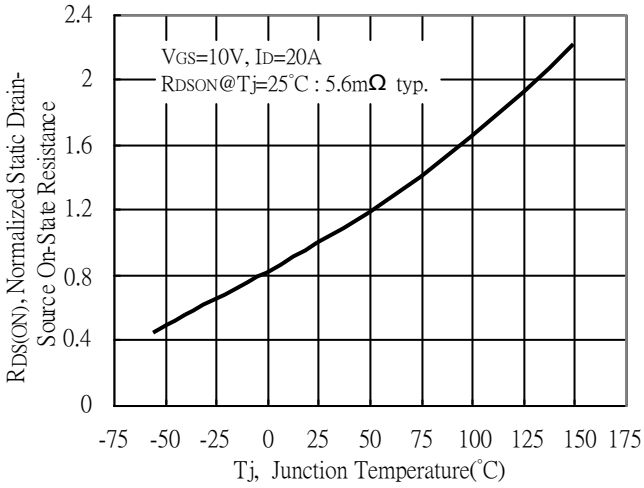
Reverse Drain Current vs Source-Drain Voltage



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

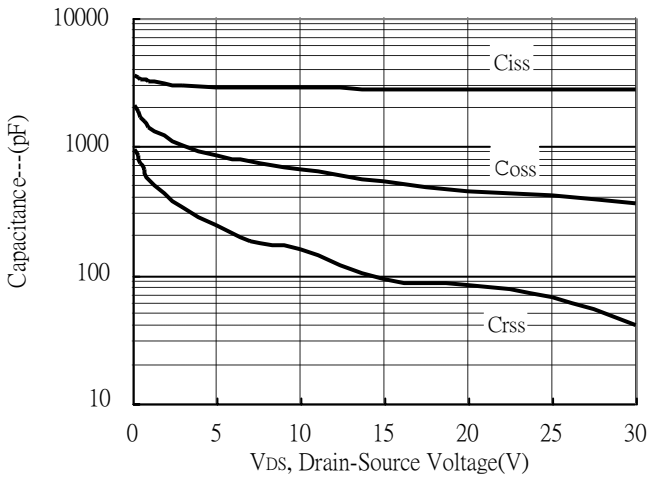


Drain-Source On-State Resistance vs Junction Tempearture

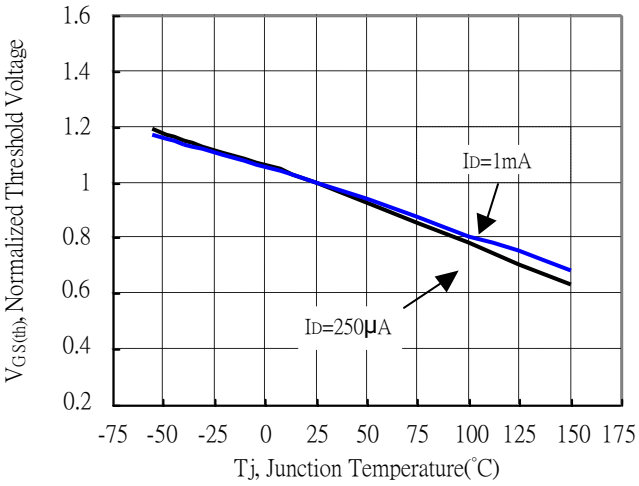


Typical Characteristics(Cont.)

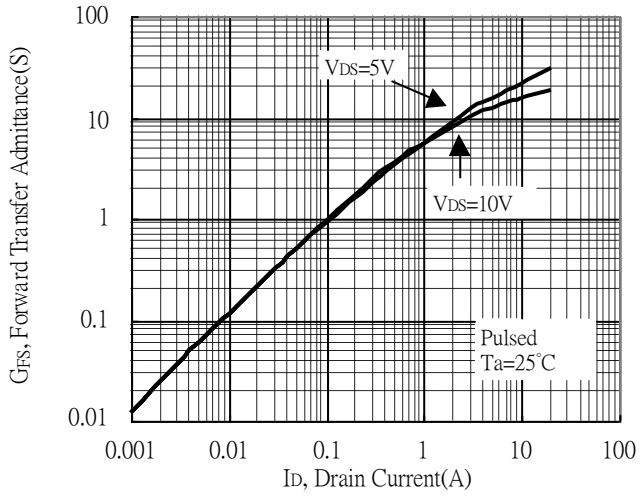
Capacitance vs Drain-to-Source Voltage



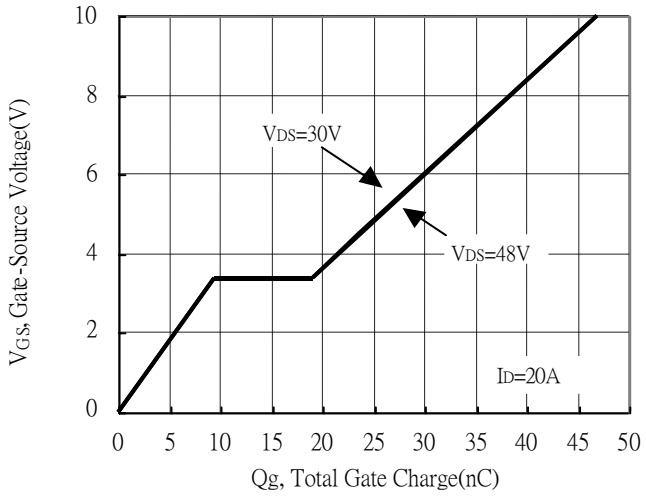
Threshold Voltage vs Junction Tempearture



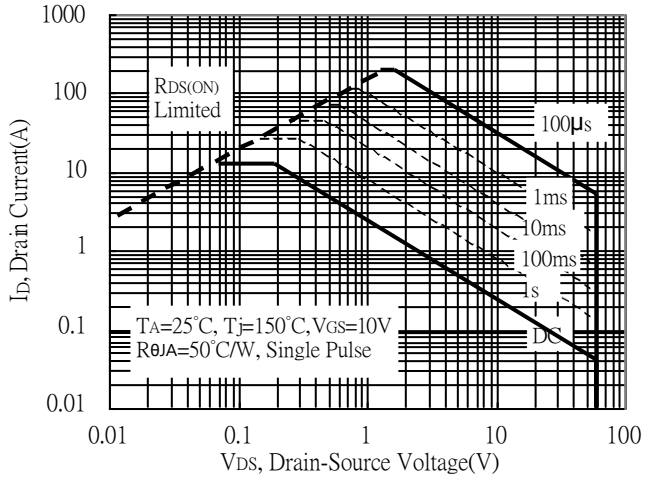
Forward Transfer Admittance vs Drain Current



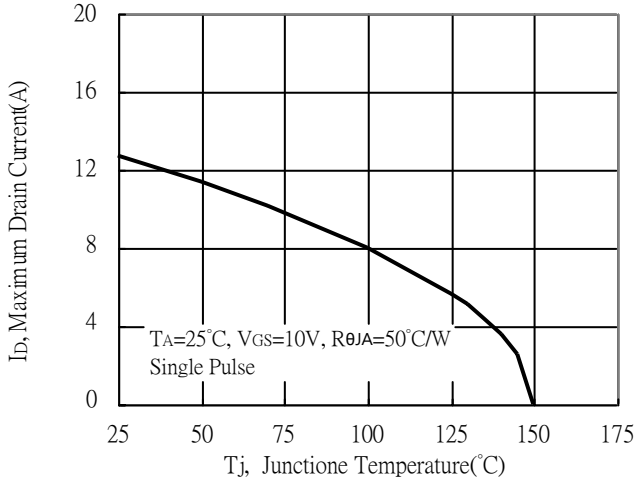
Gate Charge Characteristics



Maximum Safe Operating Area

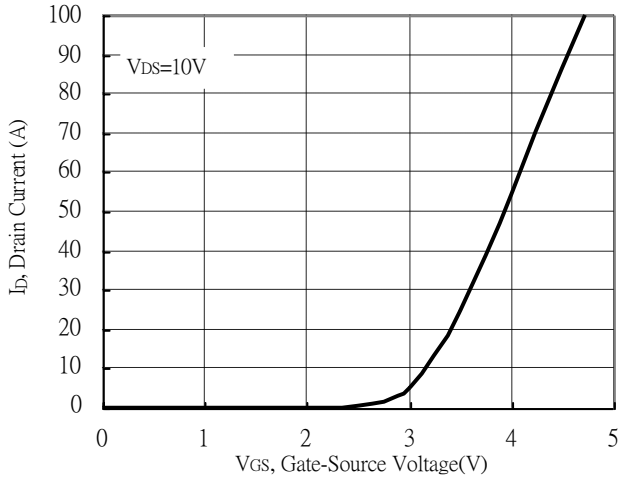


Maximum Drain Current vs Junction Temperature

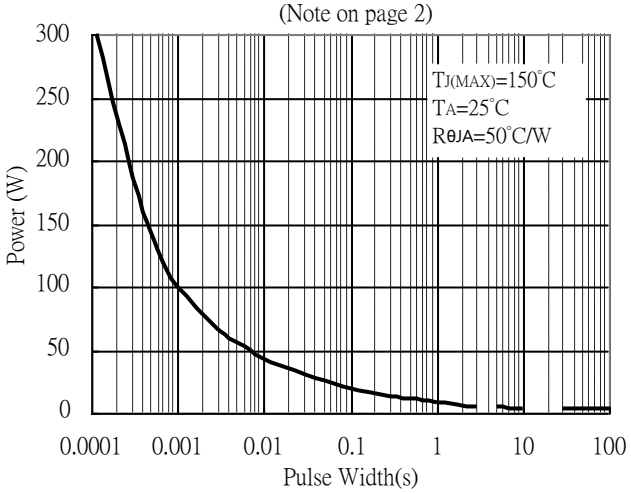


Typical Characteristics(Cont.)

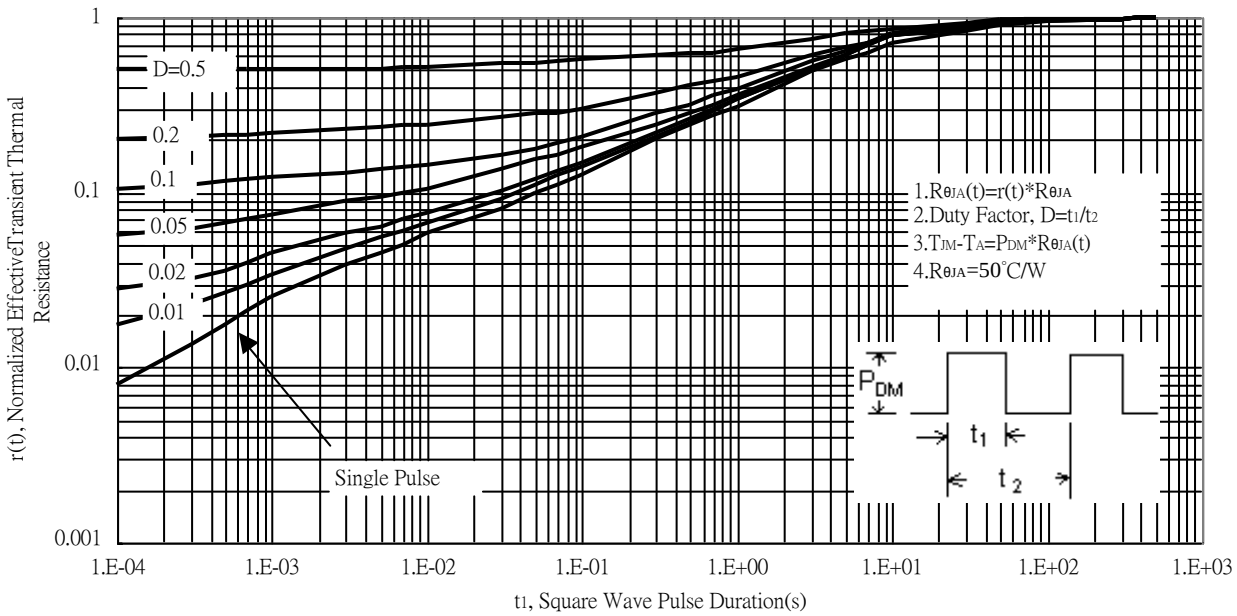
Typical Transfer Characteristics



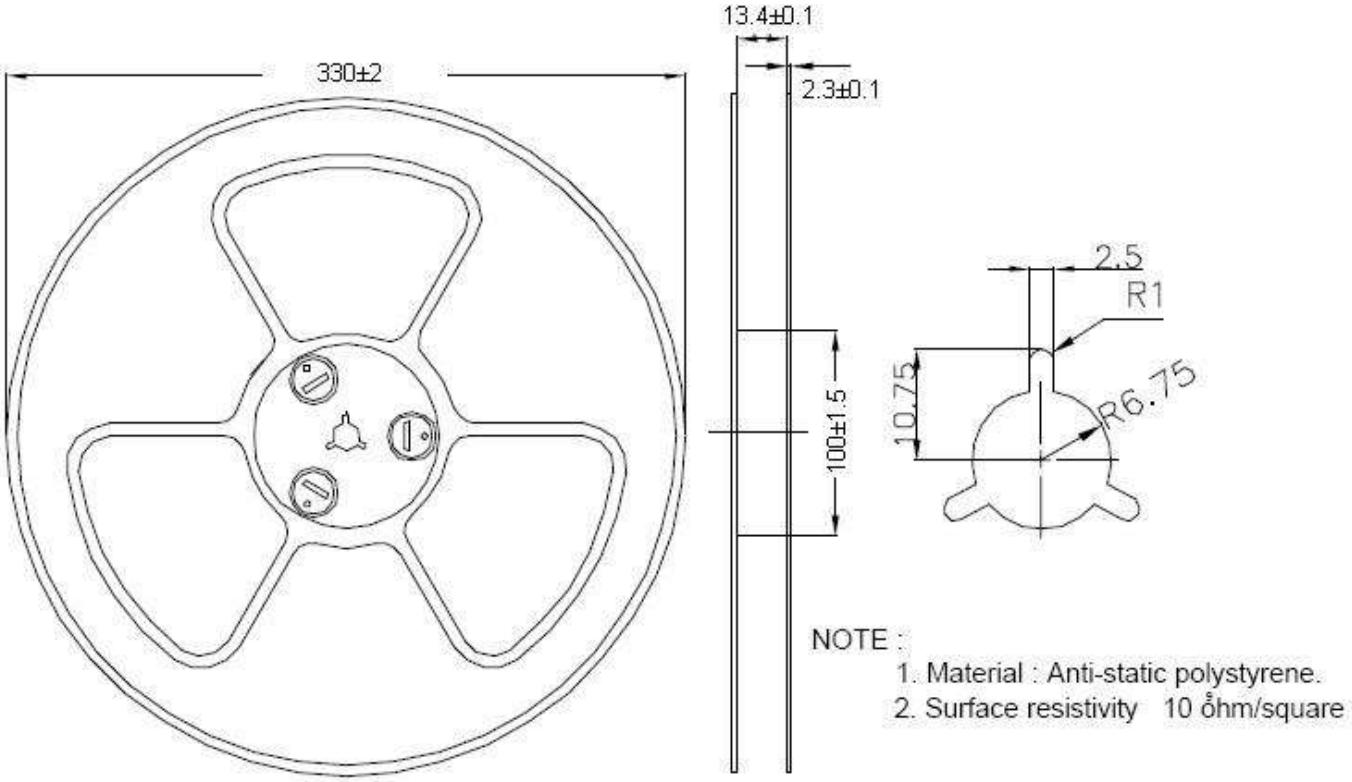
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



Transient Thermal Response Curves

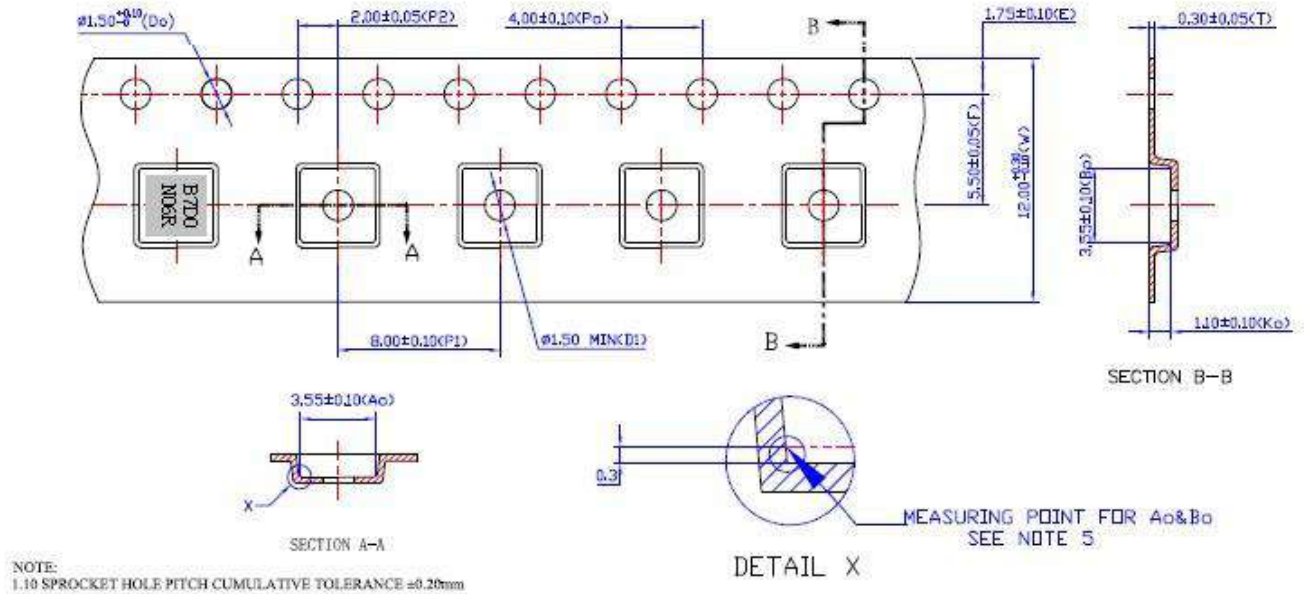


Reel Dimension



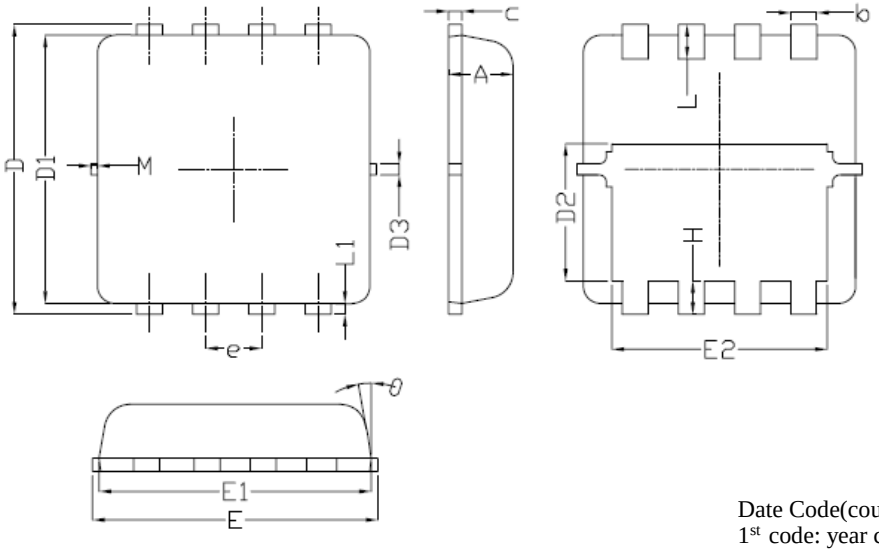
NOTE :
1. Material : Anti-static polystyrene.
2. Surface resistivity 10 ôhm/square

Carrier Tape Dimension

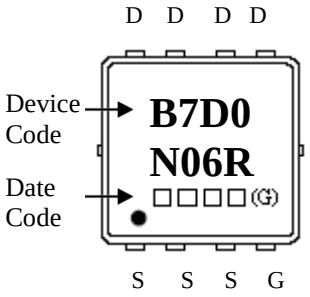


NOTE:
1.10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.20mm
2.CAMBER:REFERENCE TO CARRIER TAPE INSPECITON MANUAL
3.MATERIAL:BLACK CONDUCTIVE POLYSTYRENE
4.ALL DIMENSIONS ARE IN MILLIMETERS (UNLESS OTHERWISE SPECIFIED)
5.Ao AND Bo MEASURED ON A PLANE 0.30mm ABOVE THE BOTTOM OF THE POCKET
6.Ko MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
7.POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET,NOT POCKET HOLE
8.SURFACE RESISTIVITY:
1X10E4~1X10E11 OHMS/SQ

DFN3×3 Dimension



Marking:



8-Lead DFN3×3 Plastic Package

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

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.70	0.80	0.028	0.031	E1	3.00	3.20	0.118	0.126
b	0.25	0.35	0.010	0.014	E2	2.39	2.59	0.094	0.102
c	0.10	0.25	0.004	0.010	e	0.65 BSC		0.026 BSC	
D	3.25	3.45	0.128	0.136	H	0.30	0.50	0.012	0.020
D1	3.00	3.20	0.118	0.126	L	0.30	0.50	0.012	0.020
D2	1.48	1.68	0.058	0.066	L1	0.13 TYP		0.005 TYP	
D3	0.13 TYP		0.005 TYP		θ	8°	12°	8°	12°
E	3.20	3.40	0.126	0.134	M	-	0.15	-	0.006