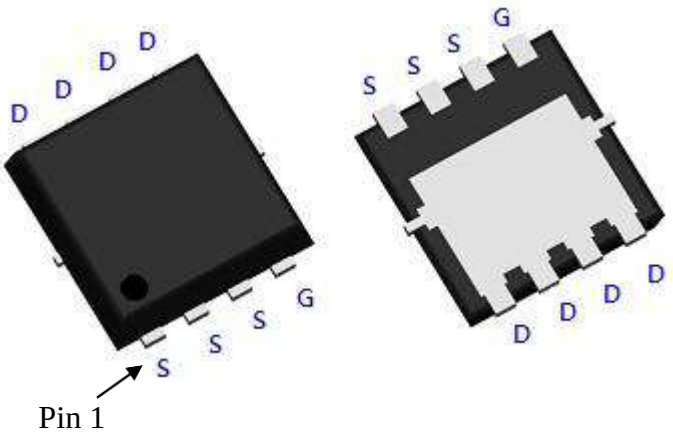
N-Channel Enhancement Mode Power MOSFET

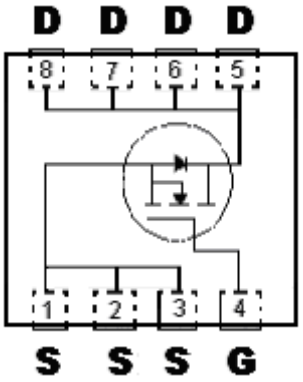
Features:

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free lead plating package

DFN3x3



BV_{DSS}	30V
I_D@T_C=25°C,V_{GS}=10V	55A(silicon limit)
I_D@T_C=25°C,V_{GS}=10V	25A(package limit)
I_D@T_A=25°C,V_{GS}=10V	14A
$R_{DS(ON)}$@V_{GS}=10V, I_D=20A	2.8 mΩ(typ.)
$R_{DS(ON)}$@V_{GS}=4.5V,I_D=20A	4.0 mΩ(typ.)



G：Gate S：Source D：Drain

Ordering Information

Device	Package	Shipping
KSPRB2D8N03R	DFN3x3 (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 @ T_C=25°C, V_{GS}=10V(silicon limit)		I_D	55	A
Continuous Drain Current @ T_C=100°C, V_{GS}=10V(silicon limit)			35	
Continuous Drain Current @ T_C=25°C, V_{GS}=10V(package limit)			25	
Continuous Drain Current @ T_A=25°C, V_{GS}=10V			14	
Continuous Drain Current @ T_A=70°C, V_{GS}=10V			11	
Pulsed Drain Current		I_{DM}	220*1	
Avalanche Current @ L=0.1mH		I_{AS}	22	
Avalanche Energy @ L=0.5mH		E_{AS}	42	mJ
Total Power Dissipation	T_C=25°C	P_D	25	W
	T_C=100°C		10	
	T_A=25°C		1.8*3	
	T_A=70°C		1.1*3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	5.2	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	71 *3	

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle≤1%
3. Surface mounted on 1 in² copper pad of FR-4 board, t≤10s ; 125°C/W when mounted on minimum copper pad.

Electrical Characteristics (T_J=25°C, unless otherwise specified)

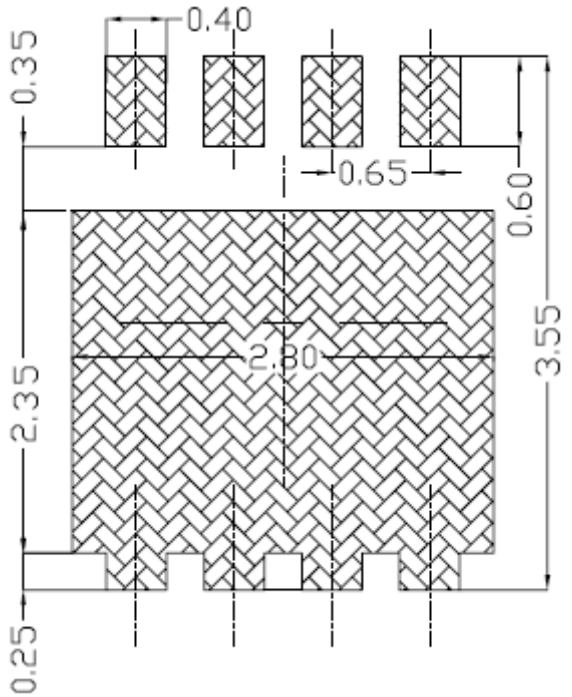
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1	-	2.5		V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0V
	-	-	5		V_{DS}=24V, V_{GS}=0V, T_J=55°C
$R_{DS(ON)}$*1	-	2.8	3.7	mΩ	V_{GS}=10V, I_D=20A
	-	4	5.7		V_{GS}=4.5V, I_D=20A
G_{FS} *1	-	28	-	S	V_{DS}=5V, I_D=10A

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
Ciss	-	1569	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	1108	-		
Crss	-	125	-		
Qg *1, 2	-	28	-	nC	V_{DS}=15V, I_D=20A, V_{GS}=10V
Qgs*1, 2	-	5	-		
Qgd*1, 2	-	6	-		
$t_{d(ON)}$ *1, 2	-	14	-	ns	V_{DS}=15V, I_D=20A, V_{GS}=10V R_G=6Ω
tr *1, 2	-	15	-		
$t_{d(OFF)}$*1, 2	-	43	-		
t_f *1, 2	-	11	-		
Rg	-	0.9	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	20	A	
I_{SM}*3	-	-	80		
V_{SD}*1	-	0.83	1.2	V	I_S=10A, V_{GS}=0V
trr	-	29.4	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	15.8	-	nC	

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

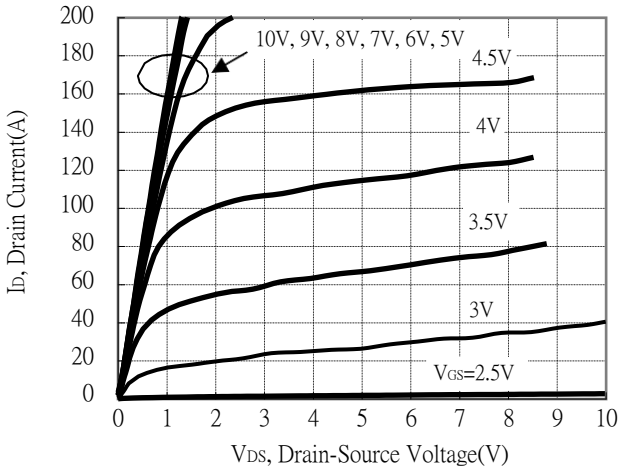
Recommended Soldering Footprint



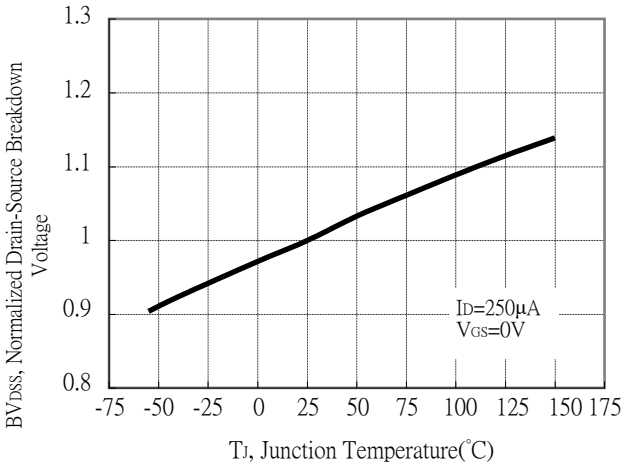
unit : mm

Typical Characteristics

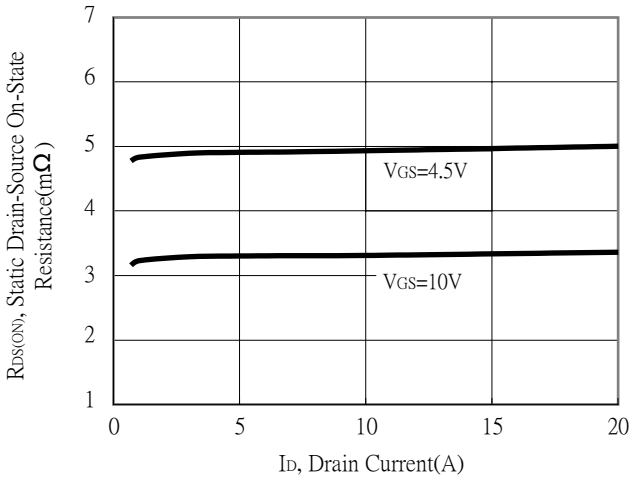
Typical Output Characteristics



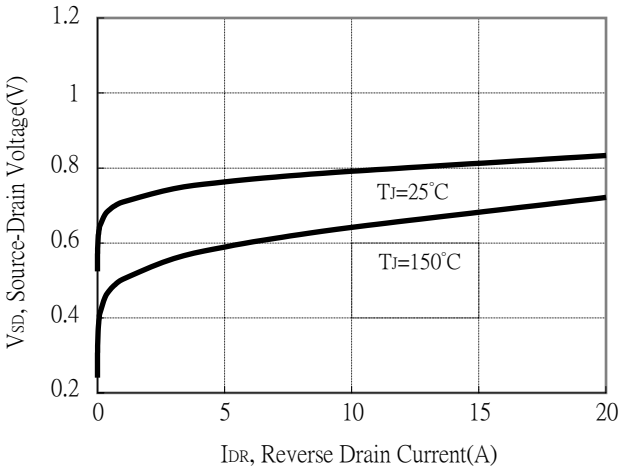
Brekdown Voltage vs Ambient Temperature



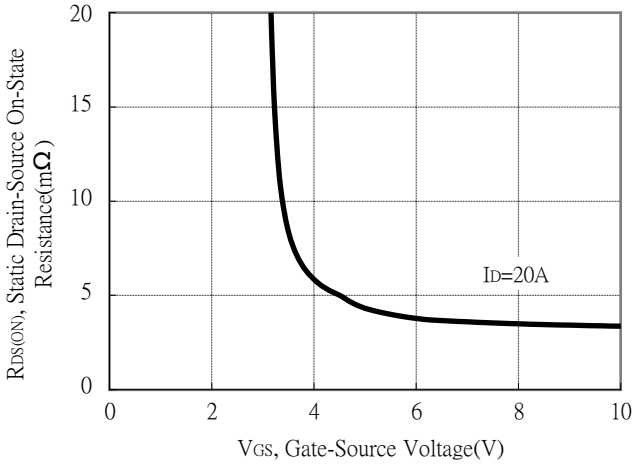
Static Drain-Source On-State resistance vs Drain Current



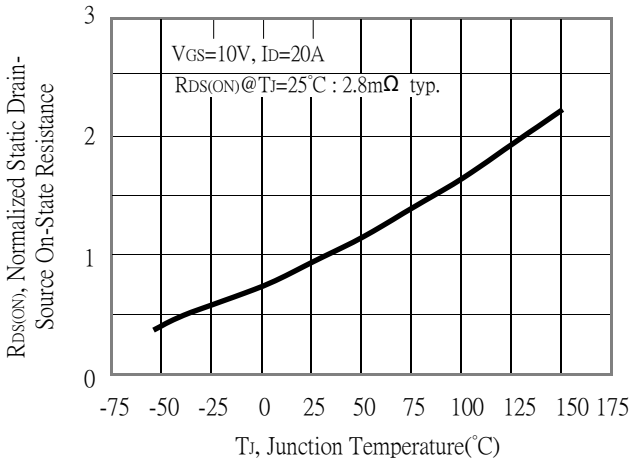
Reverse Drain Current vs Source-Drain Voltage



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

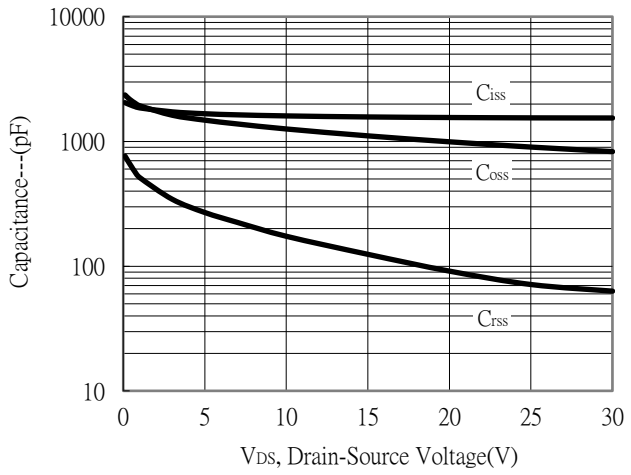


Drain-Source On-State Resistance vs Junction Tempearture

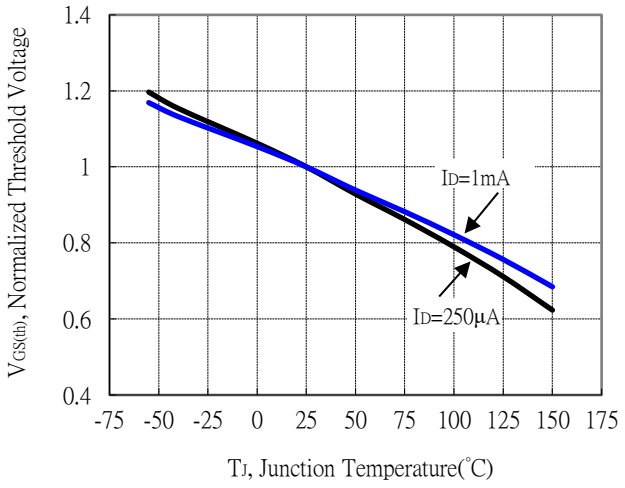


Typical Characteristics(Cont.)

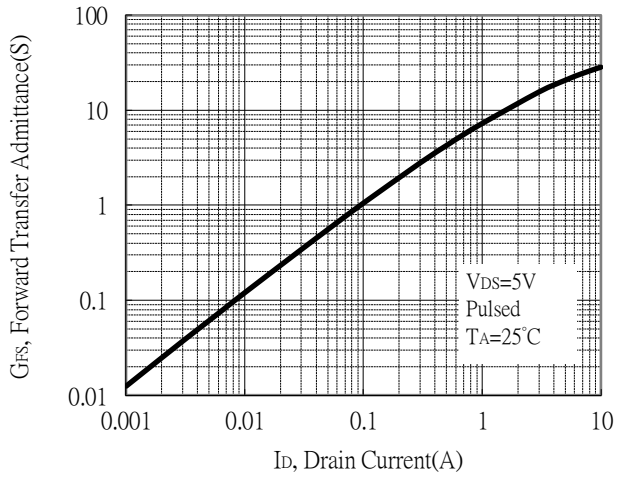
Capacitance vs Drain-to-Source Voltage



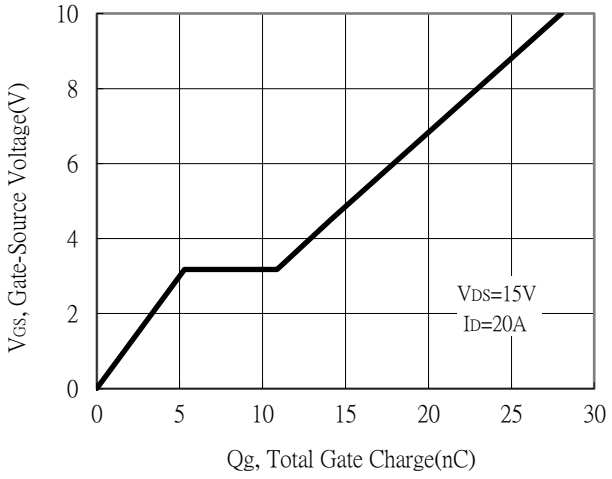
Threshold Voltage vs Junction Tempearture



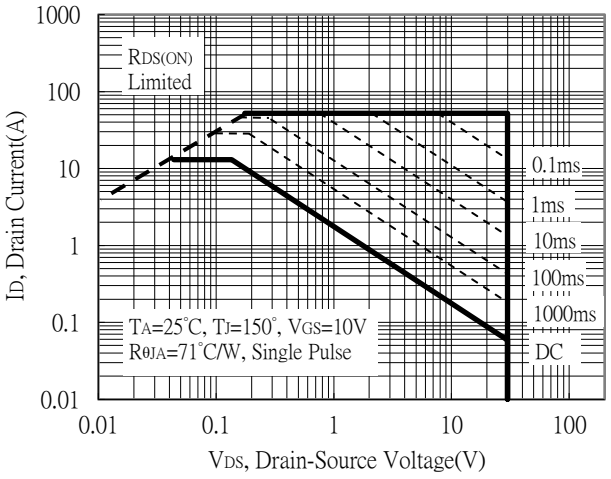
Forward Transfer Admittance vs Drain Current



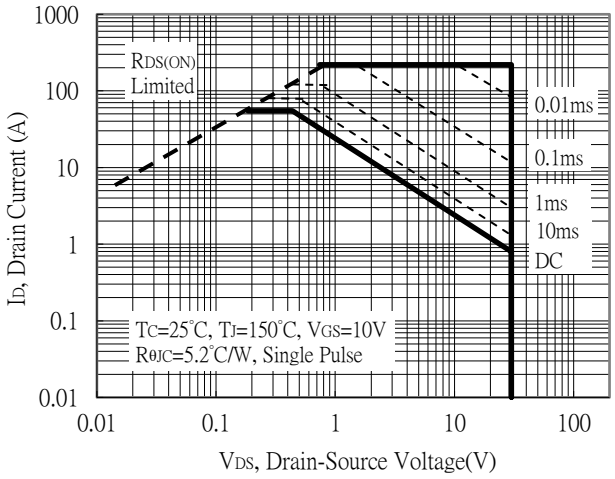
Gate Charge Characteristics



Maximum Safe Operating Area

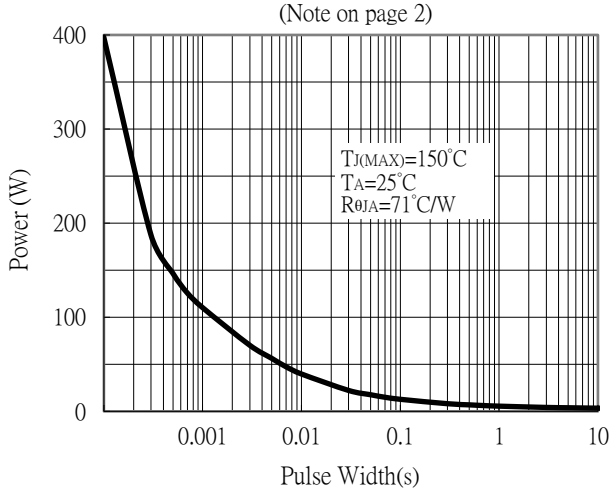


Maximum Safe Operating Area

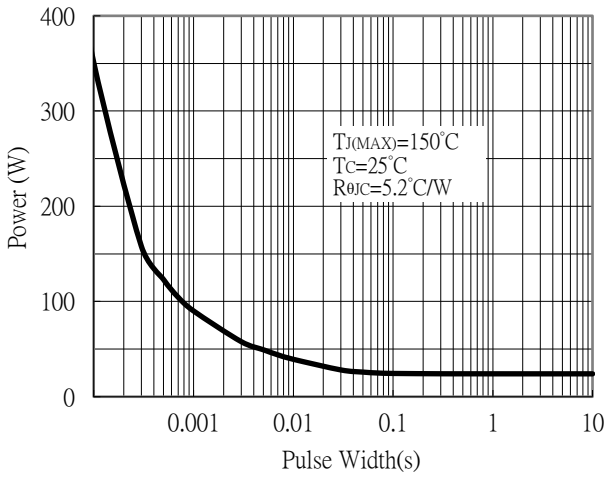


Typical Characteristics(Cont.)

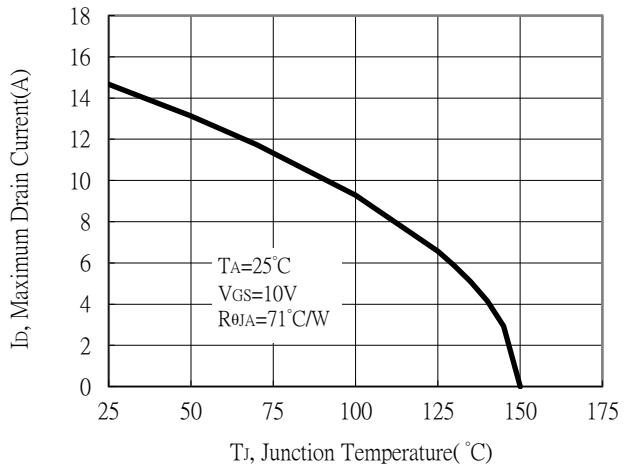
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



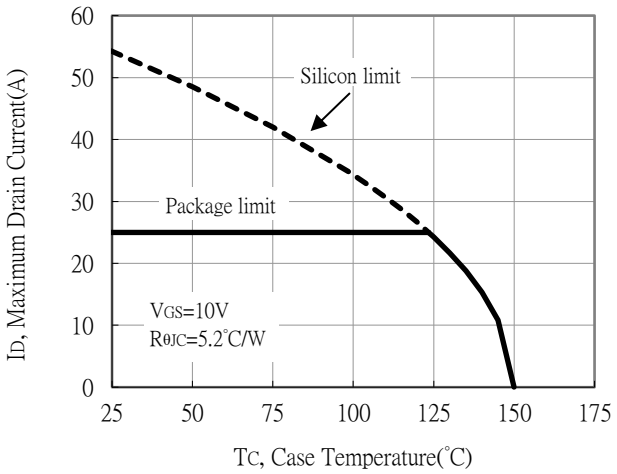
Single Pulse Maximum Power Dissipation



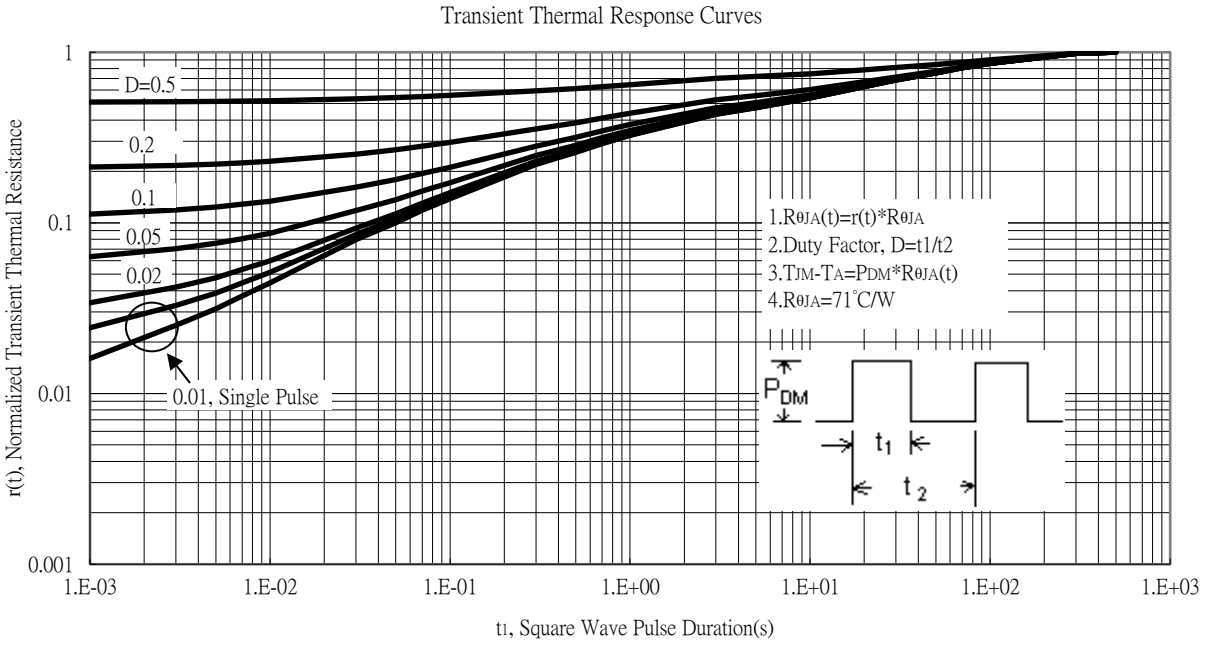
Maximum Drain Current vs Junction Temperature

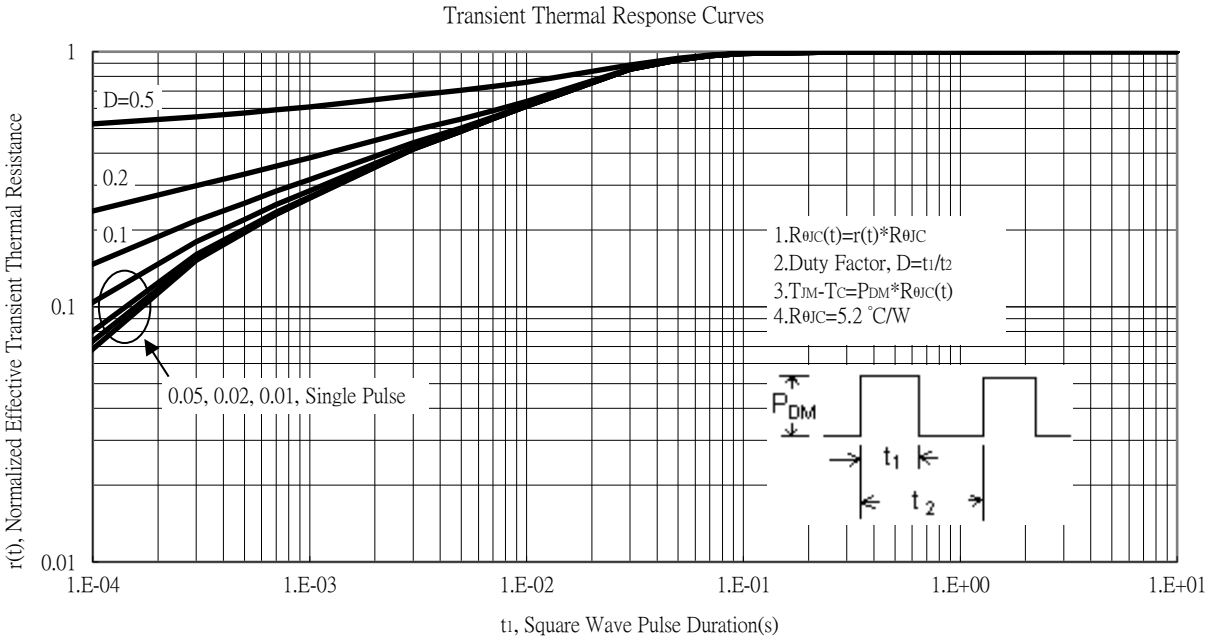


Maximum Drain Current vs Case Temperature

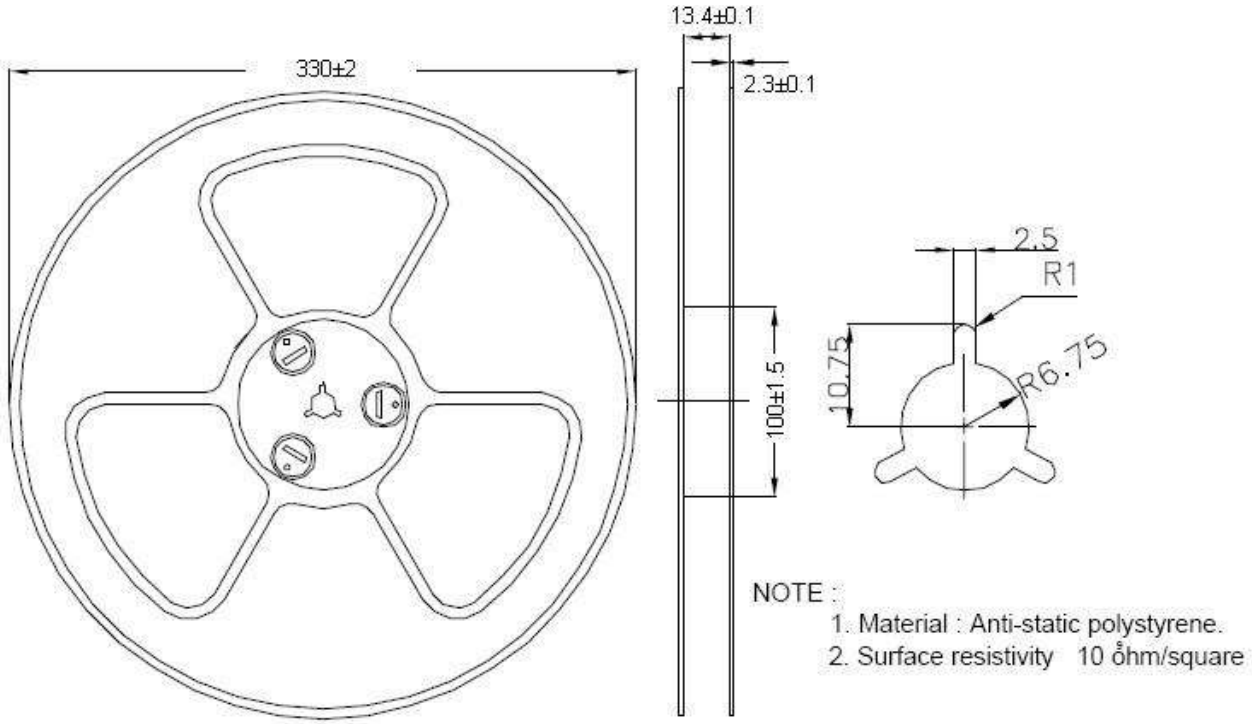


Typical Characteristics(Cont.)



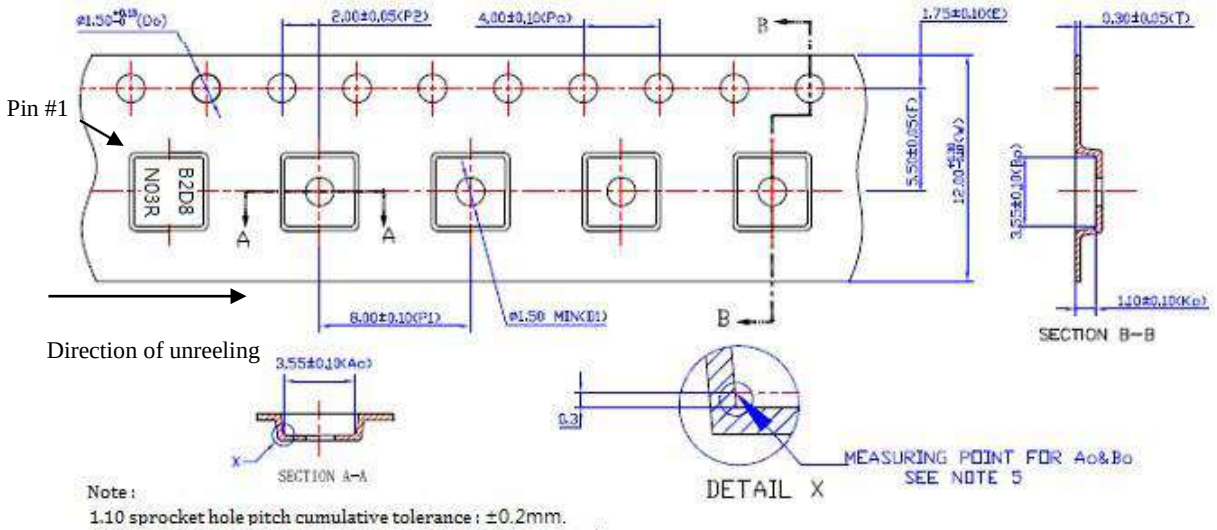


Reel Dimension



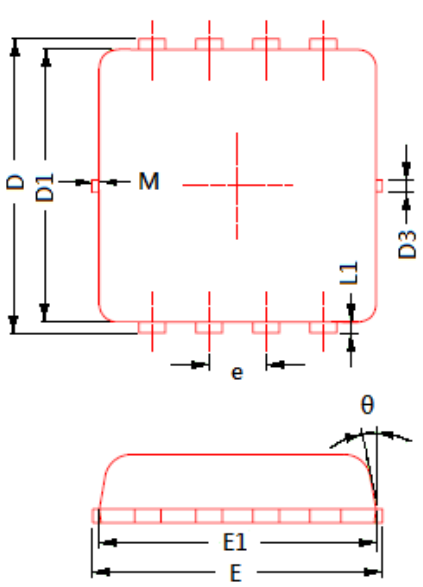
NOTE :
1. Material : Anti-static polystyrene.
2. Surface resistivity 10 ôhm/square

Carrier Tape Dimension



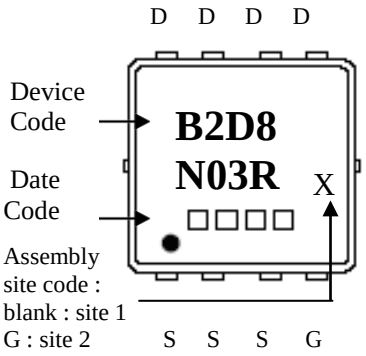
Note :
1.10 sprocket hole pitch cumulative tolerance : ±0.2mm.
2.Camber : Reference to carrier tape inspection manual.
3.Material : black conductive polystyrene.
4.All dimensions are in millimeters(unless otherwise specified).
5.Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
6.Ko 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 the pocket, not pocket hole.
8.Surface resistivity : 1×10E4~1×10E11 ohms/sq

DFN3x3 Dimension



8-Lead DFN3x3 Plastic Package

Marking:



Date code : (From left to right)
First code : Year code, the last digit of Christine year.
For example, 2017→7, 2018→8, 2019→9, …, etc.
Second 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
Third and fourth 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	1.78	1.98	0.070	0.078	L1	0.13 TYP		0.005 TYP	
D3	0.13 TYP		0.005 TYP		θ	-	12°	-	12°
E	3.20	3.40	0.126	0.134	M	-	0.15	-	0.006