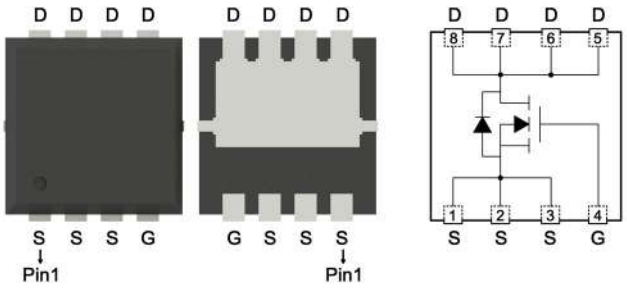
N-Channel Enhancement Mode Power MOSFET

Features

- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free

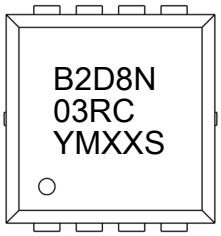
DFN3×3



Product Summary

BV_{DSS}	30	V
$R_{DS(ON)}$ typ. @ V_{GS}=10V, I_D=20A	2.3	mΩ
$R_{DS(ON)}$ typ. @ V_{GS}=4.5V, I_D=15A	3.5	
I_D @ V_{GS}=10V, T_C=25°C	87	A
I_D @ V_{GS}=10V, T_A=25°C	21	

Marking



← Device Code

← Date Code, Assembly site code

YMXXS: Date Code & Assembly site code Marking
Y: Year Code, the last digit of Christian year
M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99
S: Assembly site code, Site 1: T

Ordering Information

Device	Package	Shipping
KSPRB2D8N03RC	DFN3×3	3000pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	87	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		55	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		21	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		17	
Pulsed Drain Current	*c	I_{DM}	348	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	35	
Pulsed Body Diode Forward Current @ T_C=25°C	*a	I_{SM}	140	
Avalanche Current @ L=0.1mH		I_{AS}	22	
Avalanche Energy @ L=0.5mH		E_{AS}	42	mJ
Total Power Dissipation	T_C=25°C *a	P_D	42	W
	T_C=100°C *a		17	
	T_A=25°C *b		2.5	
	T_A=70°C *b		1.6	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C
Steady State Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	3	°C/W
Steady State Thermal Resistance, Junction-to-Ambient	*b	$R_{\theta JA}$	50	

Electrical Characteristics (T_A=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
G_{FS}	-	34	-	S	V_{DS}=5V, I_D=15A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0V
$R_{DS(ON)}$	-	2.3	3	mΩ	V_{GS}=10V, I_D=20A
	-	3.5	5		V_{GS}=4.5V, I_D=15A
Dynamic					
C_{iss}	-	1600	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
C_{oss}	-	1100	-		
C_{rss}	-	80	-		
R_g	-	1	-	Ω	f=1MHz
Q_g *d,e	-	14	-	nC	V_{DS}=15V, I_D=20A, V_{GS}=4.5V
Q_g *d,e	-	28	-		V_{DS}=15V, I_D=20A, V_{GS}=10V
Q_{gs} *d,e	-	5	-		
Q_{gd} *d,e	-	4.8	-		
$t_{d(ON)}$ *d,e	-	13	-	ns	V_{DS}=15V, I_D=20A, V_{GS}=10V, R_{GS}=1Ω
tr *d,e	-	13	-		
$t_{d(OFF)}$ *d,e	-	39	-		
t_f *d,e	-	7.4	-		
Source-Drain Diode					
V_{SD} *d	-	0.79	1.2	V	I_S=20A, V_{GS}=0V
t_{rr}	-	30	-	ns	I_F=20A, di/dt=100A/μs
Q_{rr}	-	14	-	nC	

Note:

*a. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.

*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

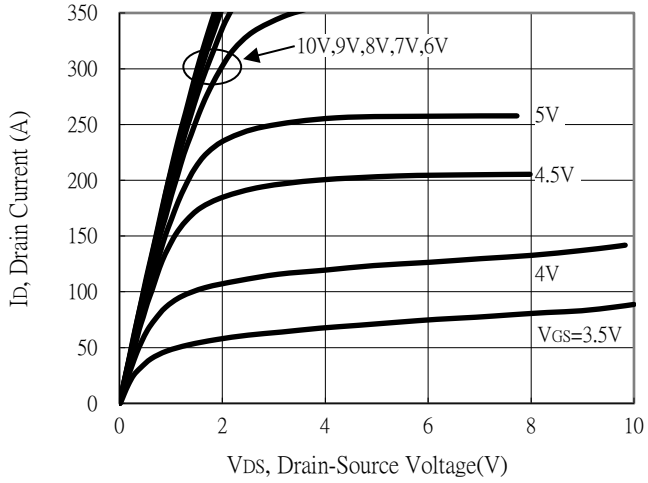
*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

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

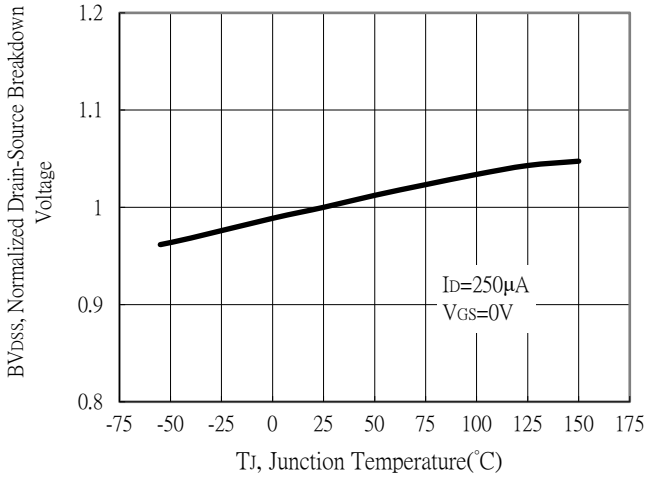
*e. Independent of operating temperature.

Typical Characteristics

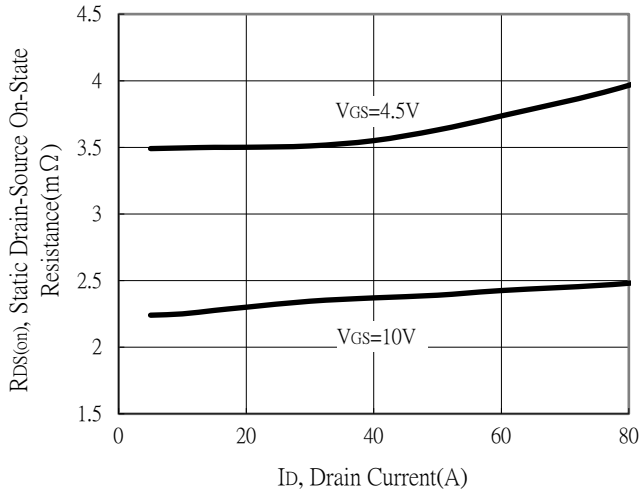
Typical Output Characteristics



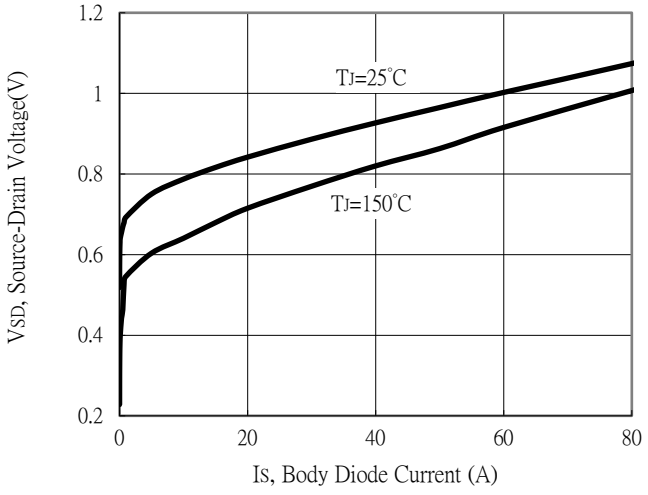
Breakdown Voltage vs Ambient Temperature



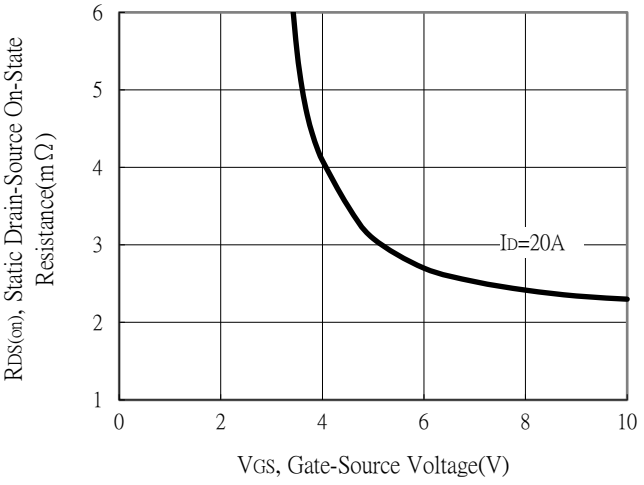
Static Drain-Source On-State resistance vs Drain Current



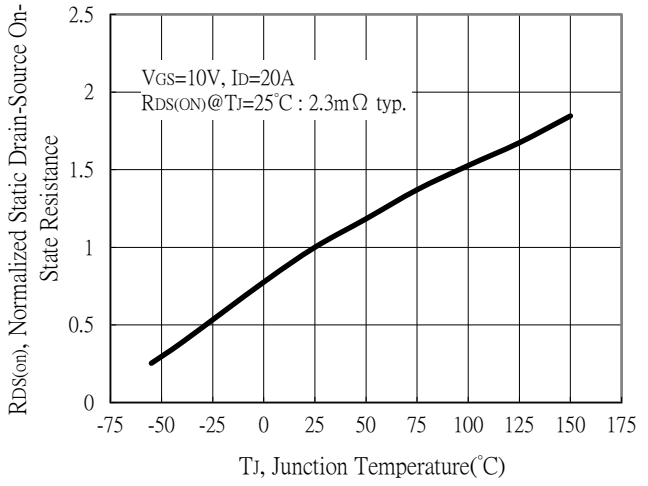
Body Diode Current vs Source-Drain Voltage



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

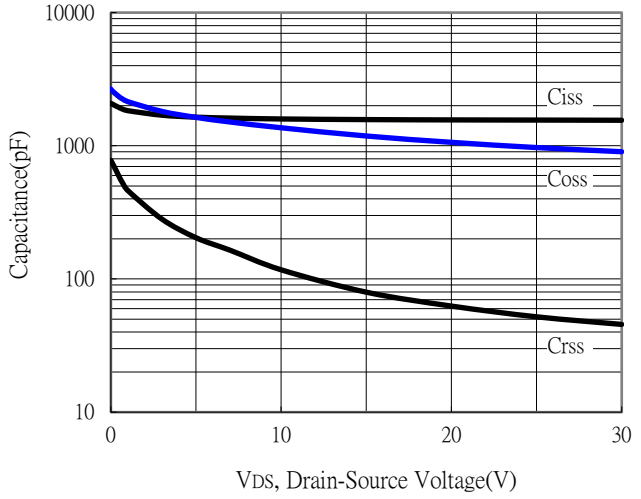


Drain-Source On-State Resistance vs Junction Temperature

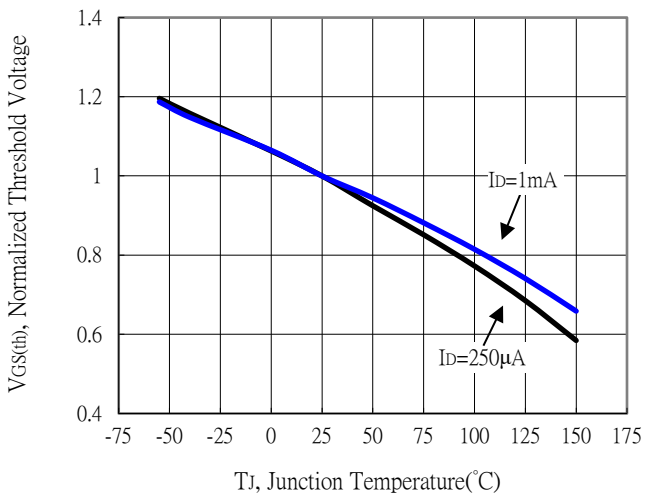


Typical Characteristics

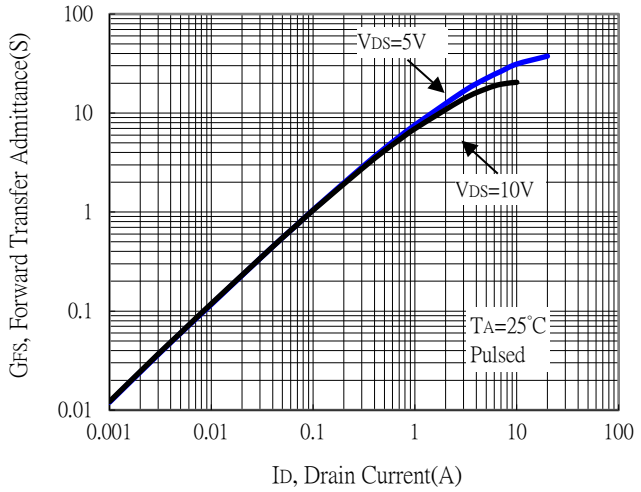
Capacitance vs Drain-to-Source Voltage



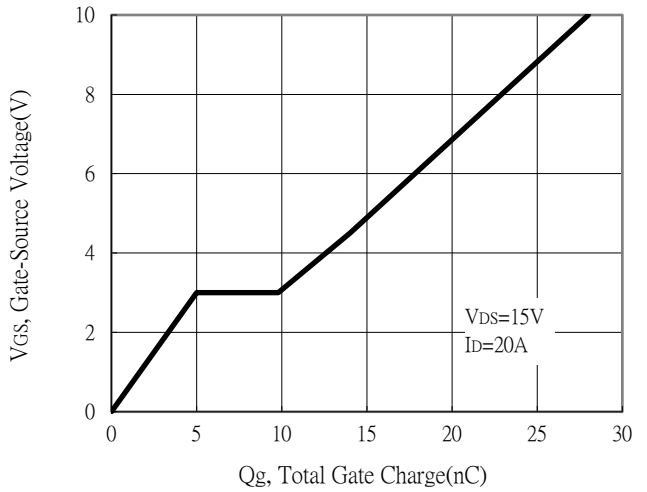
Threshold Voltage vs Junction Temperature



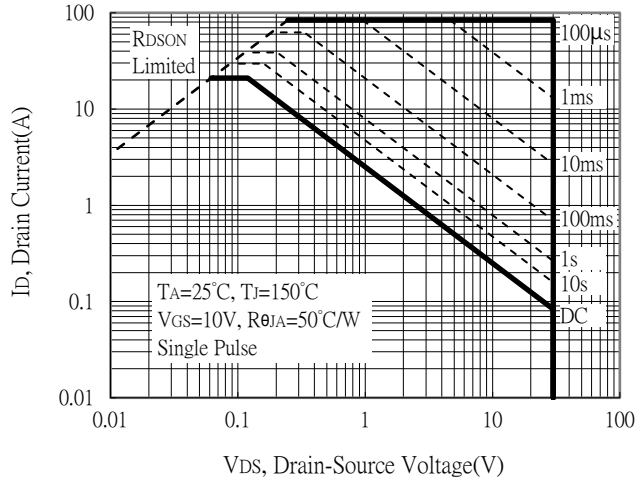
Forward Transfer Admittance vs Drain Current



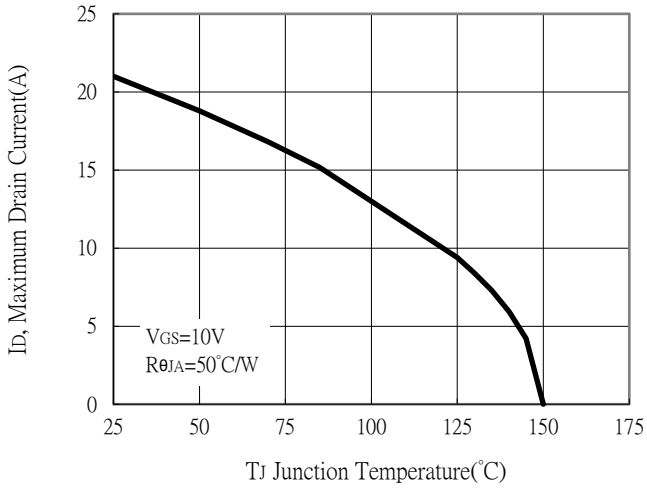
Gate Charge Characteristics



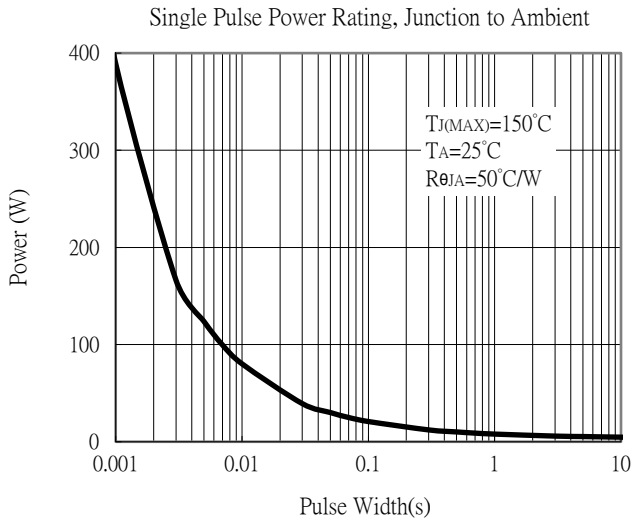
Maximum Safe Operating Area

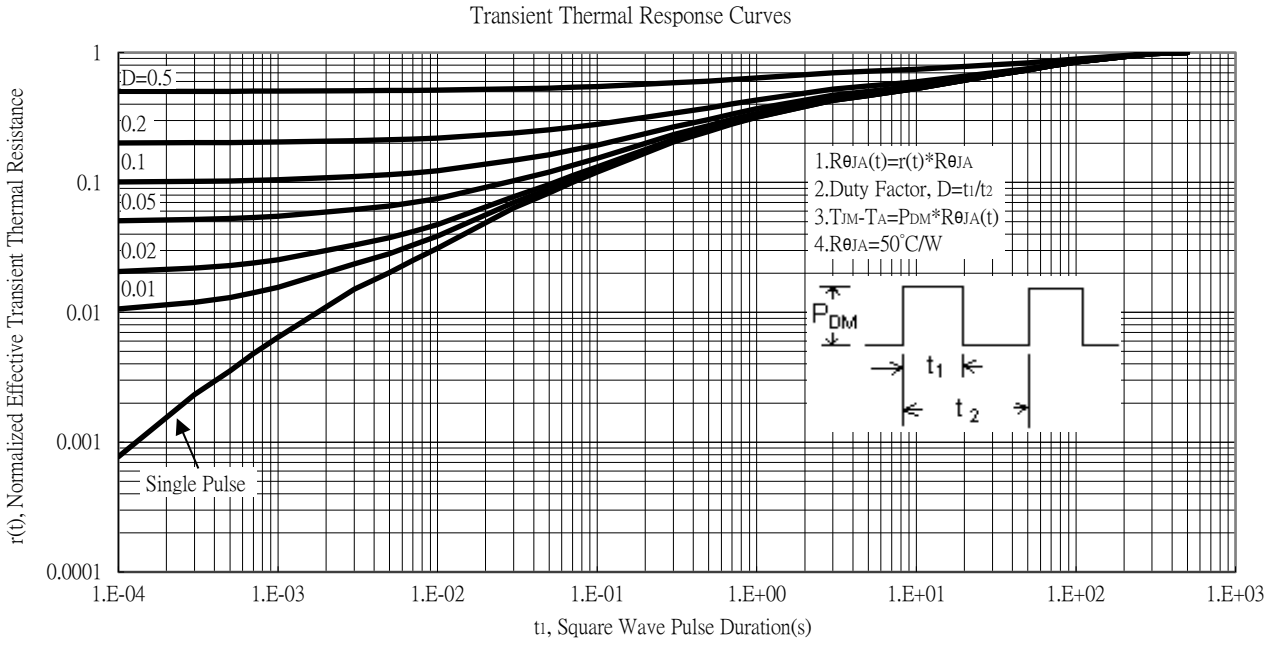


Maximum Drain Current vs Junction Temperature

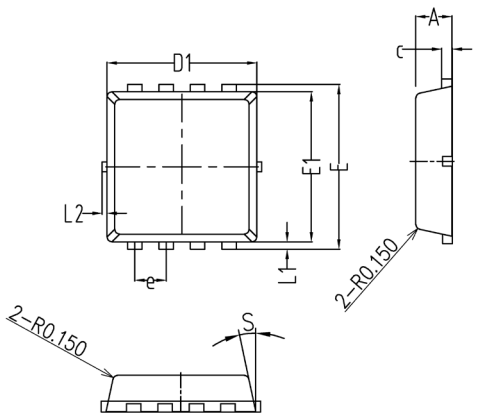


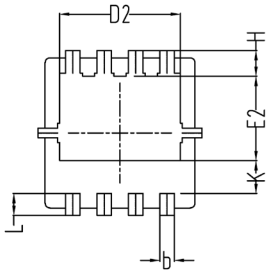
Typical Characteristics



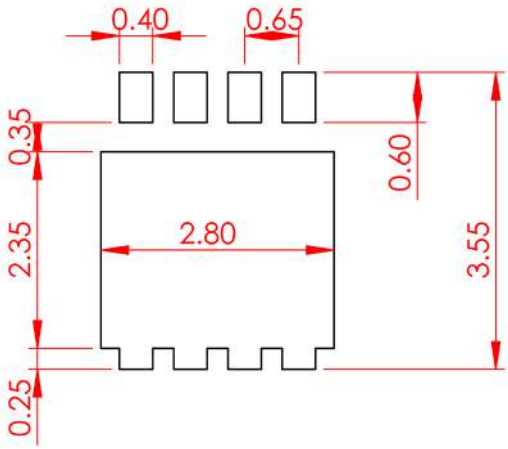


DFN3×3 Dimension





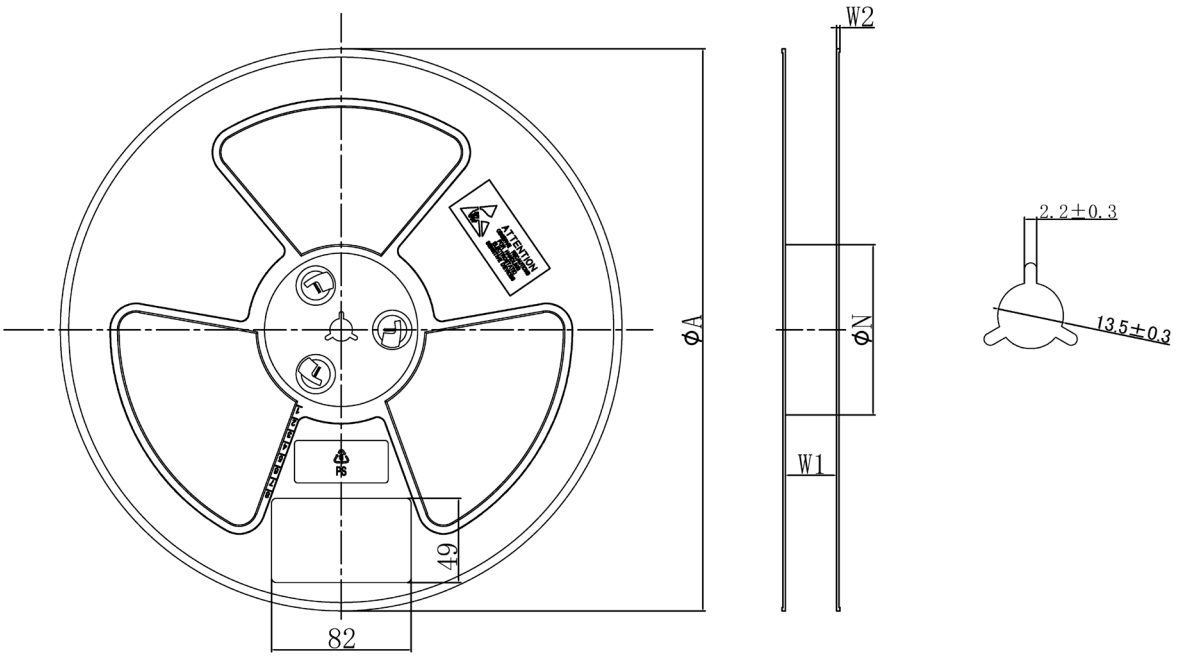
8-Lead DFN3×3 Plastic Package



Recommended Soldering Footprint

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.75	0.85	0.030	0.033	E1	3.00	3.20	0.118	0.126
b	0.25	0.35	0.010	0.014	E2	1.64	1.84	0.065	0.072
c	0.15	0.25	0.006	0.010	H	0.38	0.58	0.015	0.023
D	3.05	3.45	0.120	0.136	K	0.60	0.80	0.024	0.031
D1	3.05	3.25	0.120	0.128	L	0.30	0.50	0.012	0.020
D2	2.35	2.55	0.093	0.100	L1	0.06	0.20	0.002	0.008
e	0.55	0.75	0.022	0.030	L2	0.00	0.15	0.000	0.006
E	3.15	3.45	0.124	0.136	S	10˚	14˚	10˚	14˚

Reel Dimension

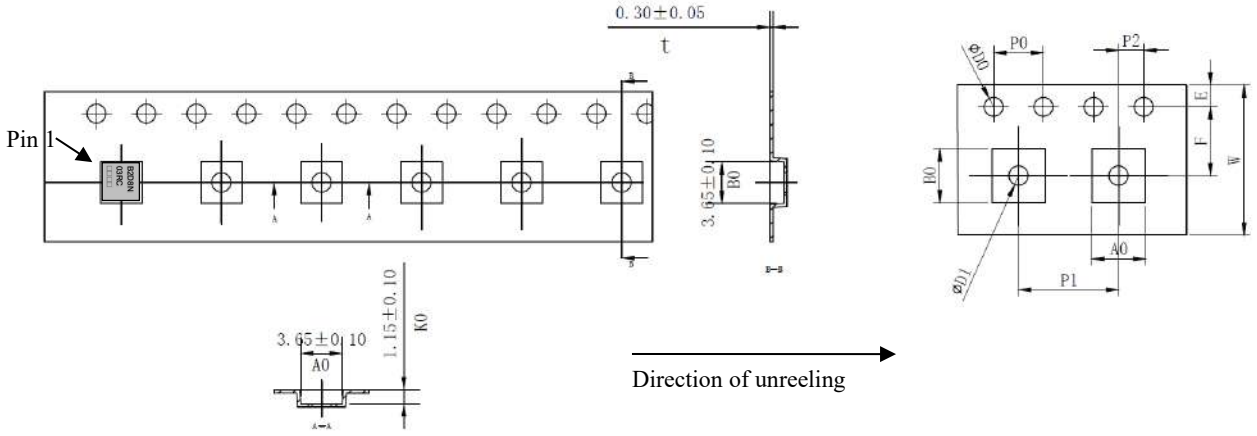


名称	ϕA	ϕN	W1	W2
13*12	330±2	100±2	12.4^{+2}_{-0}	1.8±0.3

Unit : mm

Carrier Tape Dimension

规 格	W	E	F	D0	D1	P0	P2	10P0	P1	A0	A1	B0	B1	K0	K1	t
尺 寸	12.00 ±0.30	1.75 ±0.10	5.50 ±0.05	1.50 +0.10	1.50 +0.10	4.00 ±0.10	2.00 ±0.05	40.00 ±0.20	8.00 ±0.10	3.65 ±0.10		3.65 ±0.10		1.15 ±0.10		0.30 ±0.05



Unit：mm