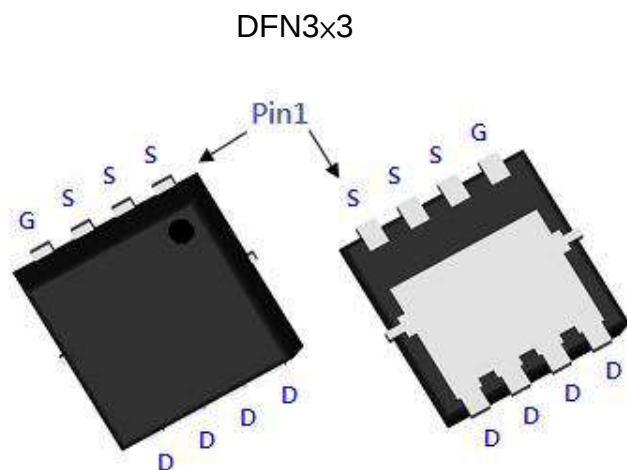


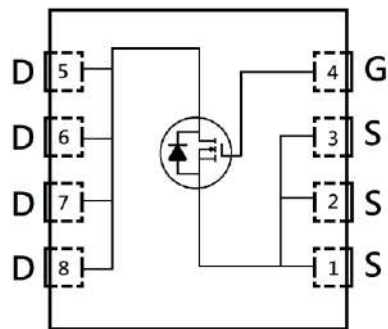
N-Channel Enhancement Mode Power MOSFET

Features:

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



BV_{DSS}		30V
$I_D @ V_{GS}=10V, T_A=25^\circ C$		13.9A
$I_D @ V_{GS}=10V, T_C=25^\circ C$		39A
$R_{DS(on)(TYP)}$	$V_{GS}=10V, I_D=12A$	6m Ω
	$V_{GS}=4.5V, I_D=9A$	9.7m Ω



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KSPRB5D8N03AR	DFN3x3 (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}	30	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current @ V _{GS} =10V, T _C =25°C		I _D	39	A
Continuous Drain Current @ V _{GS} =10V, T _C =70°C			31.2	
Continuous Drain Current @ V _{GS} =10V, T _A =25°C			13.6	
Continuous Drain Current @ V _{GS} =10V, T _A =70°C			10.9	
Pulsed Drain Current		I _{DM}	152 * ₁	
Avalanche Current @ L=0.1mH		I _{AS}	15	
Avalanche Energy @ L=0.5mH		E _{AS}	16	mJ
Total Power Dissipation	T _C =25°C	P _D	21	W
	T _C =100°C		8.4	
	T _A =25°C	P _{DSM}	2.5 * ₂	
	T _A =70°C		1.6 * ₂	
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 _{θJC}	6	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	50*2	

Note : 1. Pulse width limited by maximum junction temperature.

2. Surface mounted on a 1 in² pad of 2oz copper. In practice R_{θj-a} will be determined by customer's PCB characteristics.
125°C/W when mounted on a minimum pad of 2 oz. copper.

Characteristics (T_C=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} *1	-	15.4	-	S	V _{DS} =5V, I _D =7A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0V
	-	-	10		V _{DS} =24V, V _{GS} =0V, T _j =85°C
R _{DS(ON)} *1	-	6	8	mΩ	V _{GS} =10V, I _D =12A
	-	9.7	13.6		V _{GS} =4.5V, I _D =9A
Dynamic					
C _{iss}	-	774	-	pF	V _{DS} =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	518	-		
C _{rss}	-	62	-		
Q _g (V _{GS} =10V) *1, 2	-	14.2	-	nC	V _{DS} =15V, V _{GS} =10V, I _D =12A

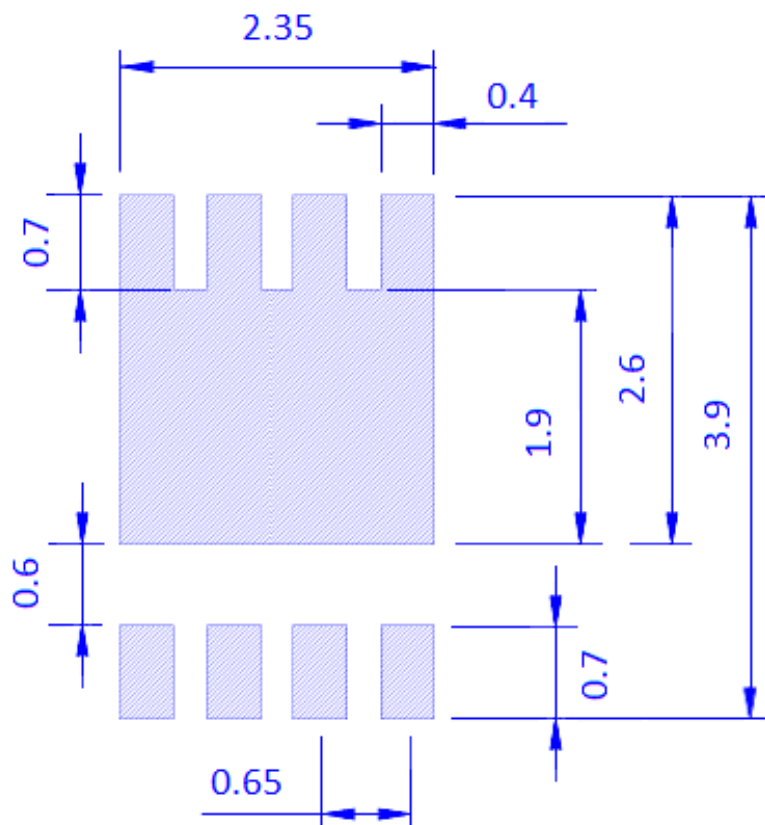
Qg(V _{GS} =4.5V) *1, 2	-	7.1	-		
Qgs *1, 2	-	2.9	-		
Qgd *1, 2	-	2.7	-		
t _{d(ON)} *1, 2	-	9	-	ns	V _{DS} =15V, I _D =12A, V _{GS} =10V, R _{GS} =6Ω
t _r *1, 2	-	13	-		
t _{d(OFF)} *1, 2	-	25.8	-		
t _f *1, 2	-	6.6	-		
R _g	-	0.8	-	Ω	f=1MHz
Source-Drain Diode					
I _S *1	-	-	16	A	
I _{SM} *3	-	-	64		
V _{SD} *1	-	0.85	1.2	V	I _S =10A, V _{GS} =0V
t _{rr}	-	17.8	-	ns	I _F =15A, dI _F /dt=100A/μs
Q _{rr}	-	6.6	-	nC	

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

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

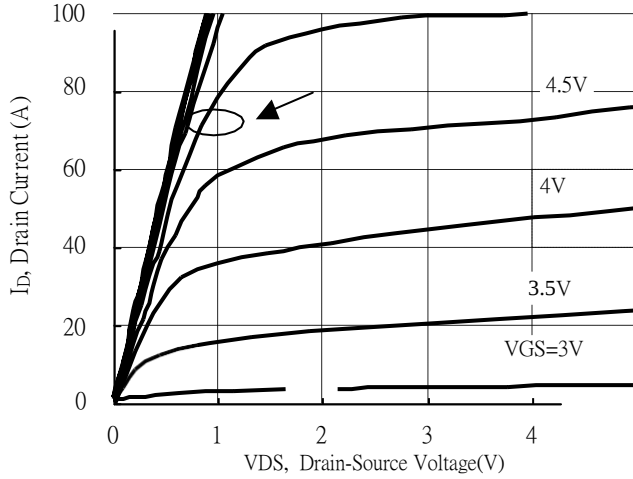
Recommended Soldering Footprint



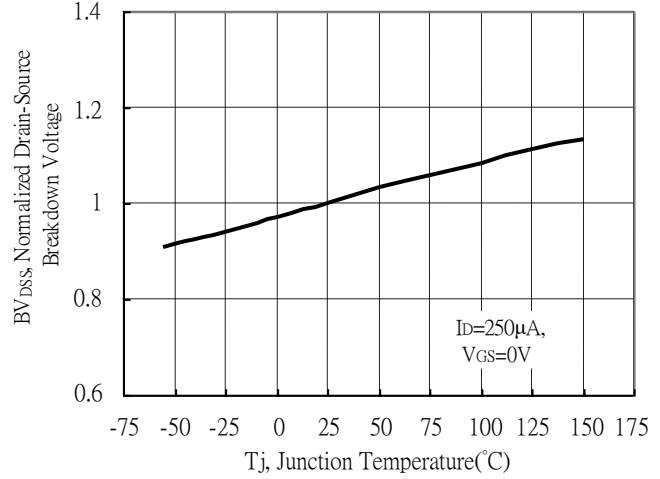
unit : mm

Typical Characteristics

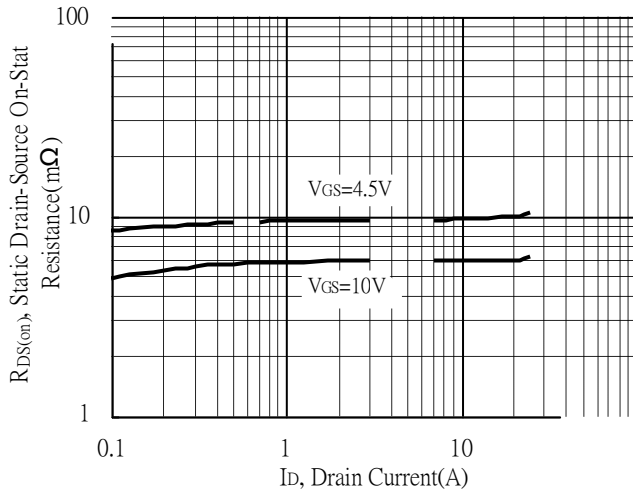
Typical Output Characteristics



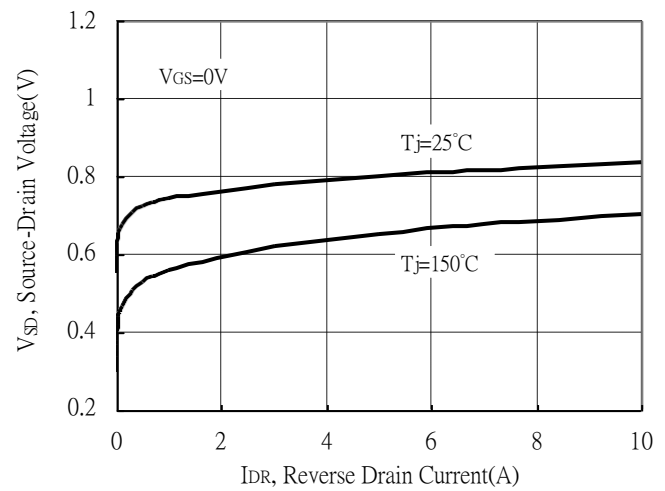
Brekdown Voltage vs Ambient Temperature



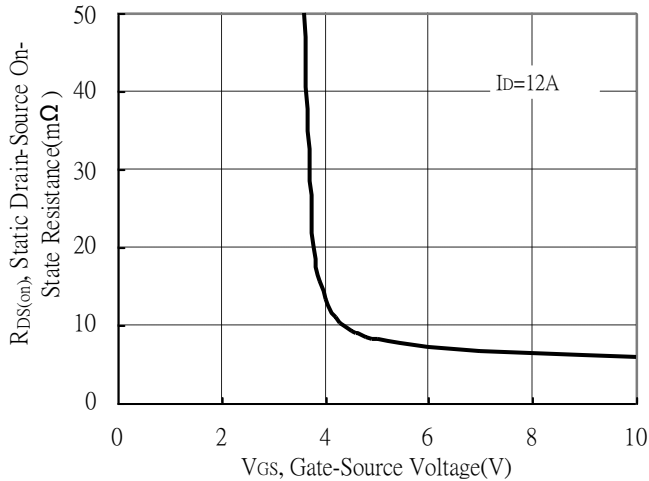
Static Drain-Source On-State resistance vs Drain Current



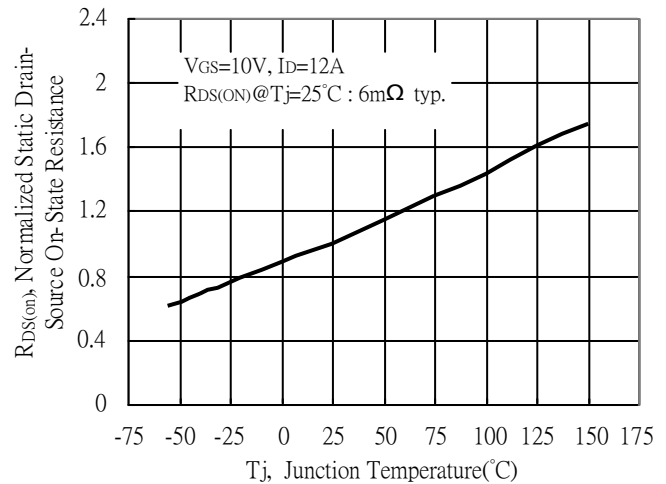
Reverse Drain Current vs Source-Drain Voltage



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

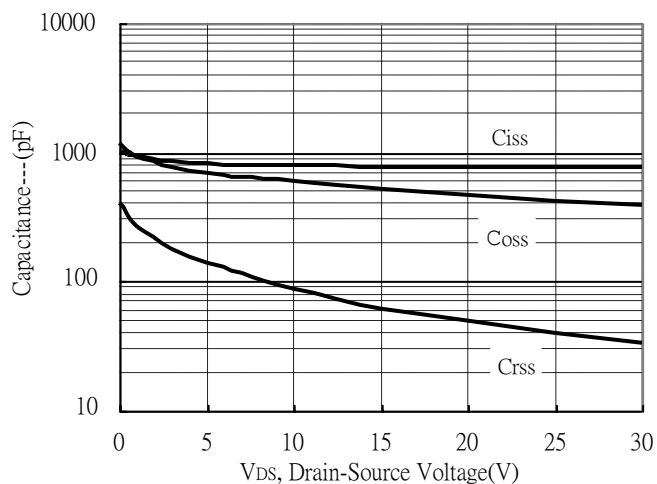


Drain-Source On-State Resistance vs Junction Temperature

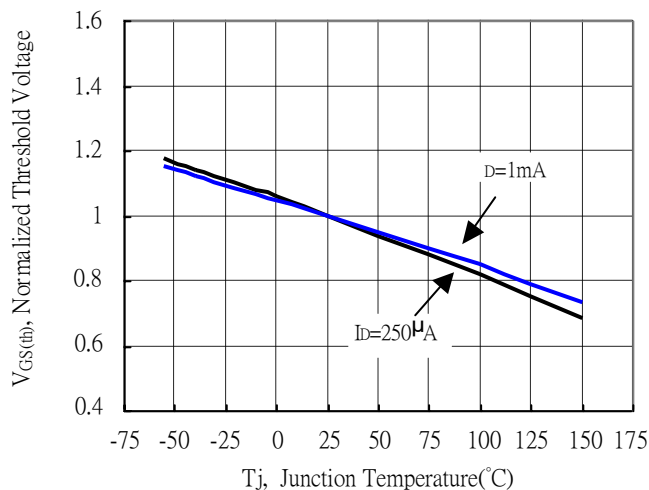


Typical Characteristics(Cont.)

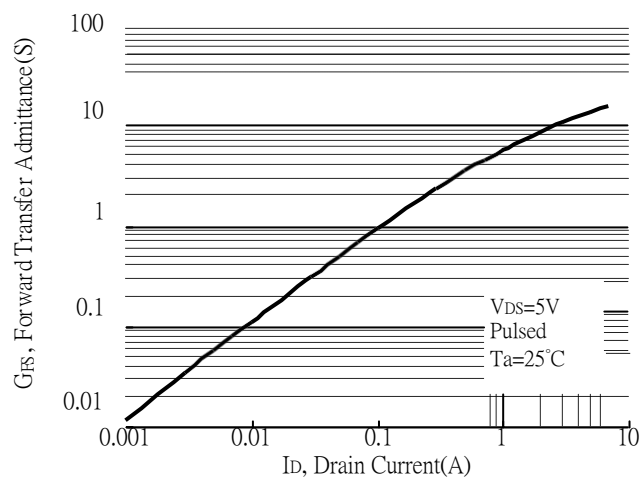
Capacitance vs Drain-to-Source Voltage



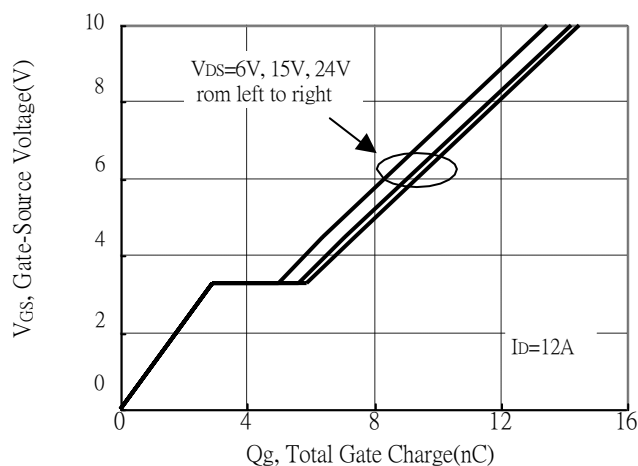
Threshold Voltage vs Junction Temperature



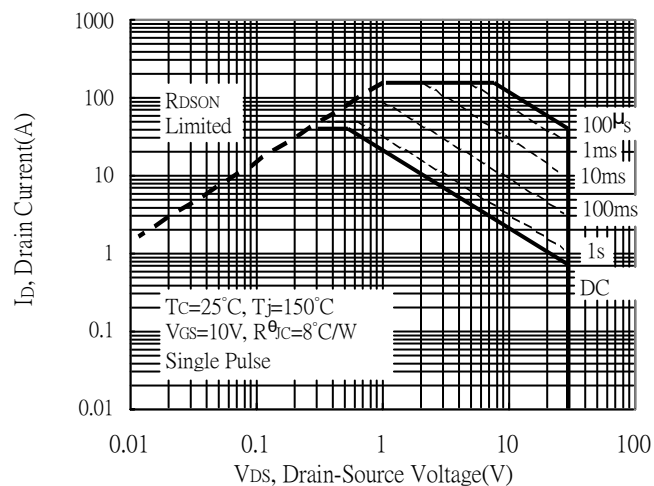
Forward Transfer Admittance vs Drain Current



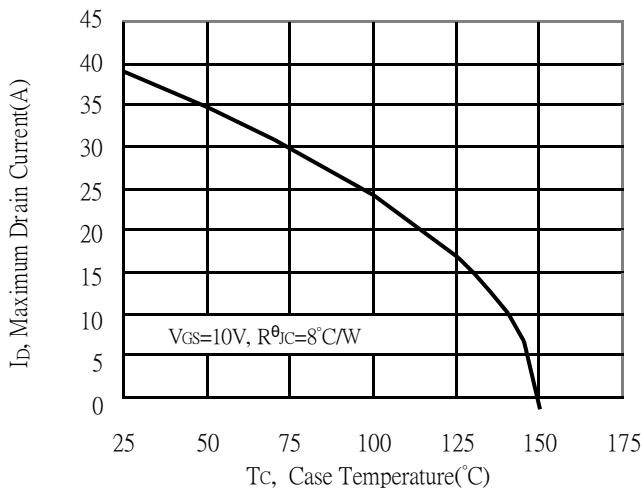
Gate Charge Characteristics



Maximum Safe Operating Area

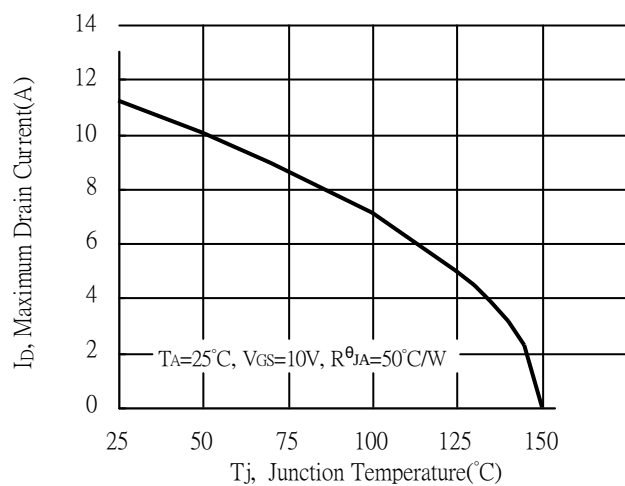


Maximum Drain Current vs Case Temperature

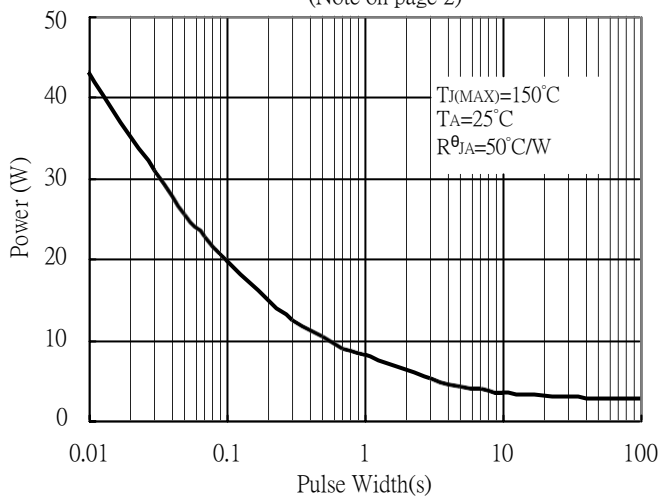


Typical Characteristics(Cont.)

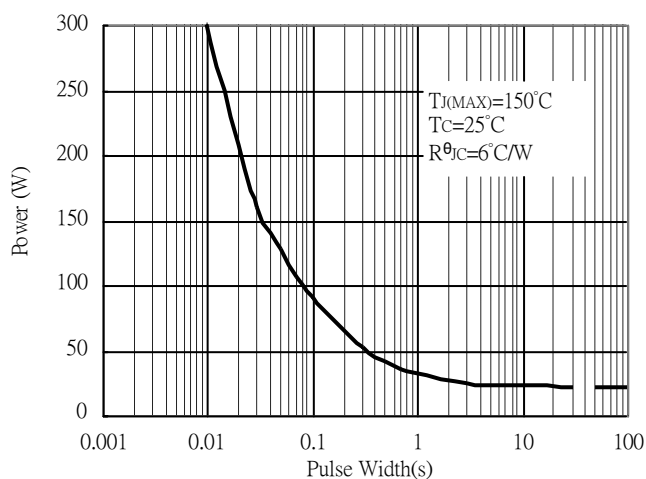
Maximum Drain Current vs Junction Temperature



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

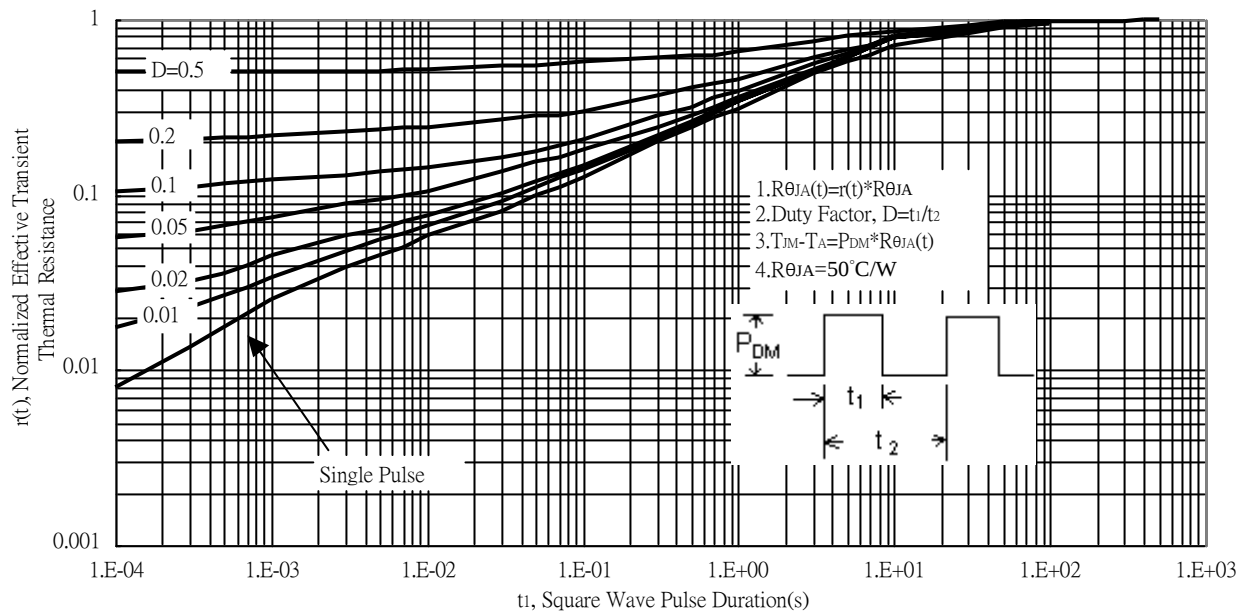


Single Pulse Power Rating, Junction to Case

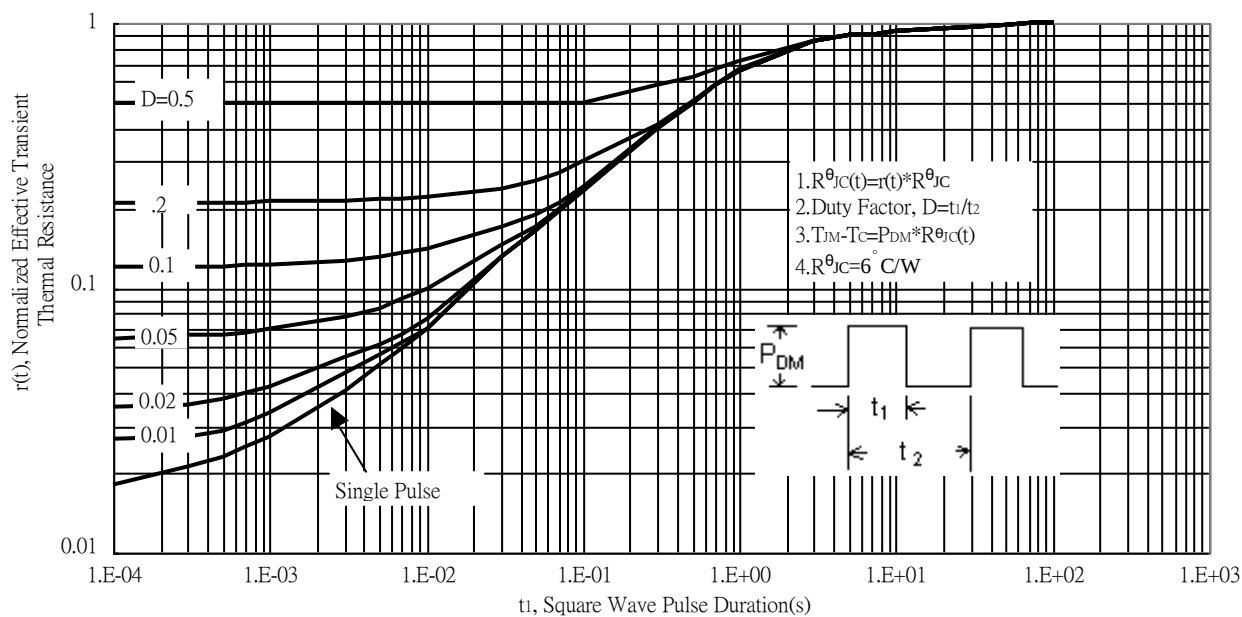


Typical Characteristics(Cont.)

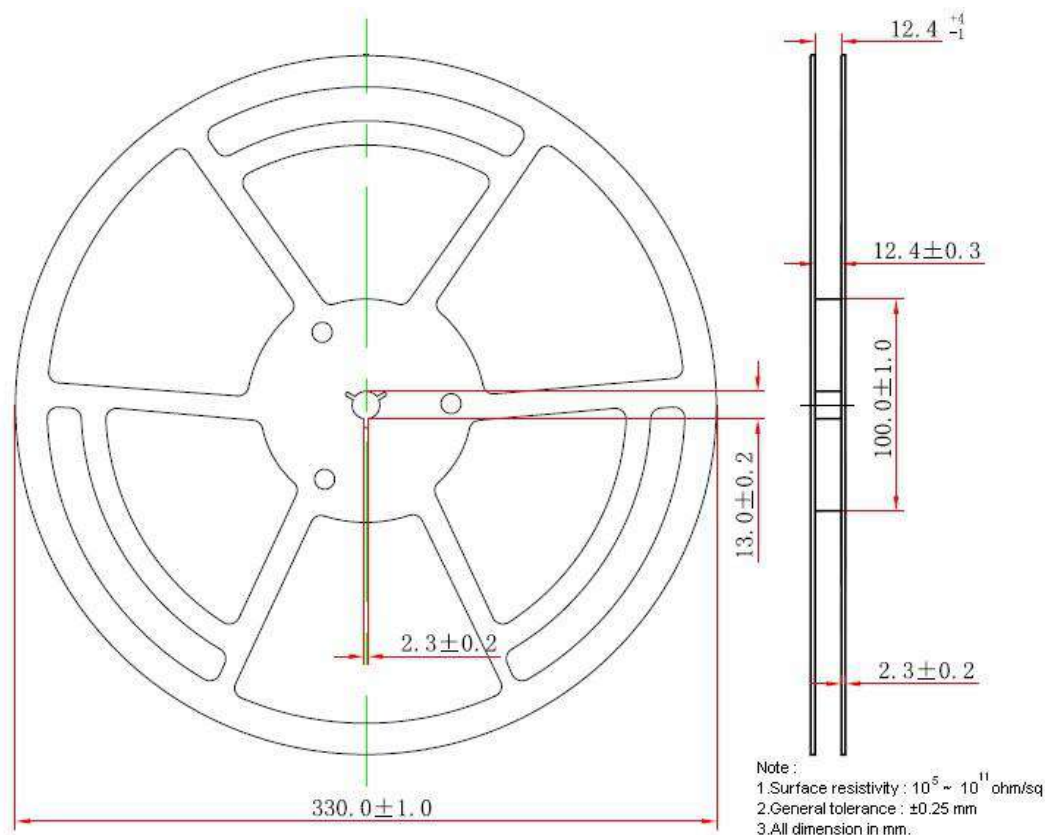
Transient Thermal Response Curves



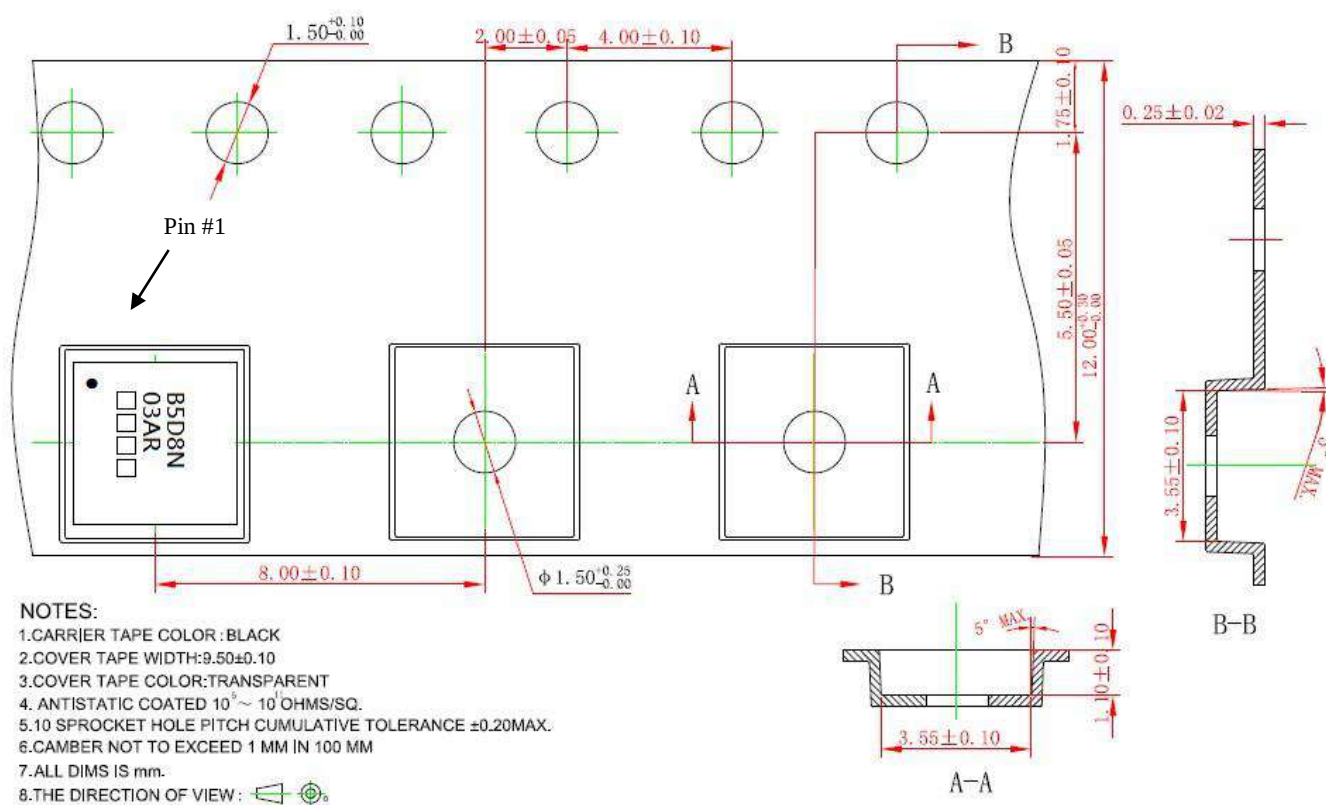
Transient Thermal Response Curves

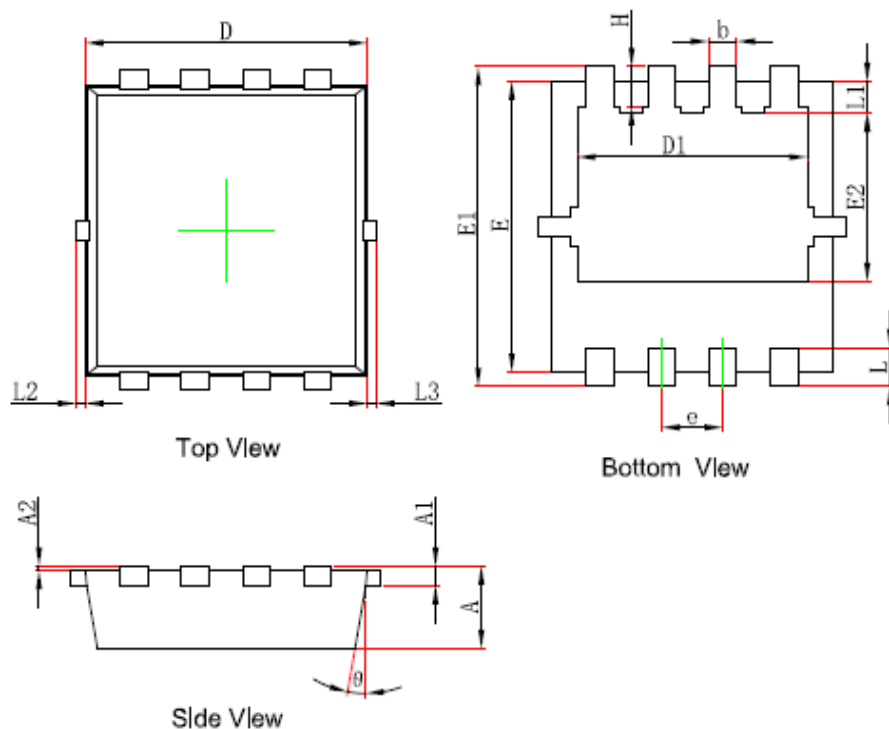


Reel Dimension

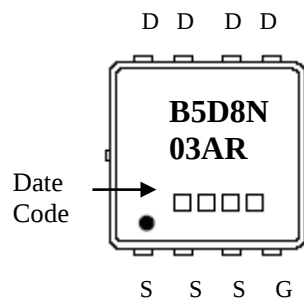


Carrier Tape Dimension





Marking:



8-Lead DFN3x3 Plastic Package

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.605	0.850	0.026	0.033	b	0.200	0.400	0.008	0.016
A1	0.152	REF	0.006	REF	e	0.550	0.750	0.022	0.030
A2	0.000	0.050	0.000	0.002	L	0.300	0.500	0.012	0.020
D	2.900	3.100	0.114	0.122	L1	0.180	0.480	0.007	0.019
D1	2.300	2.600	0.091	0.102	L2	0.000	0.100	0.000	0.004
E	2.900	3.100	0.114	0.122	L3	0.000	0.100	0.000	0.004
E1	3.150	3.450	0.124	0.136	H	0.315	0.515	0.012	0.020
E2	1.535	1.935	0.060	0.076	θ	9°	13°	9°	13°