

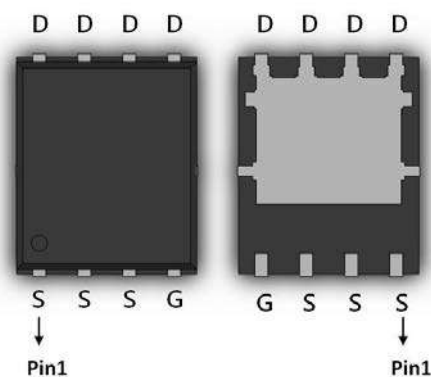
N-Channel Enhancement Mode Power MOSFET

Features

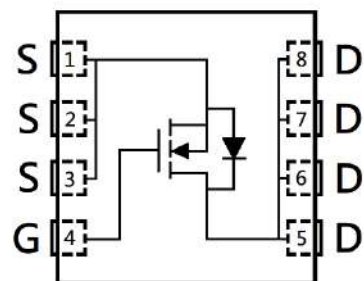
- Low Gate Charge
- Fast Switching Characteristic

BV_{DSS}	30V
$I_D @ V_{GS}=10V, T_C=25^\circ C$	26A
$I_D @ V_{GS}=10V, T_A=25^\circ C$	15A
$R_{DS(ON)} \text{ typ.} @ V_{GS}=10V, I_D=15A$	$4.2m\Omega$
$R_{DS(ON)} \text{ typ.} @ V_{GS}=4.5V, I_D=10A$	$6m\Omega$

DFN5x6



KPRB4D4N03R



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KPRB4D4N03R	DFN5x6 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

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 (silicon limit) *a	I _D	56	A
Continuous Drain Current @ V _{GS} =10V, T _C =25°C (package limit) *a		26	
Continuous Drain Current @ V _{GS} =10V, T _C =100°C *a		26	
Continuous Drain Current @ V _{GS} =10V, T _A =25°C *b		15	
Continuous Drain Current @ V _{GS} =10V, T _A =70°C *b		13	
Pulsed Drain Current *c	I _{DM}	104	
Continuous Body Diode Forward Current @ T _C =25°C *a	I _S	26	
Pulsed Body Diode Forward Current @ T _C =25°C *a	I _{SM}	104	
Avalanche Current @ L=0.1mH	I _{AS}	16	
Avalanche Energy @ L=0.5mH	E _{AS}	23	mJ
Total Power Dissipation	P _D	T _C =25°C *a	W
		T _C =100°C *a	
		T _A =25°C *b	
		T _A =70°C *b	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case	R _{θJC}	3.8	°C/W
Thermal Resistance, Junction-to-ambient *b	R _{θJA}	52	

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 limit for cases where additional heatsinking is used.
- *b. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} 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.

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise specified)

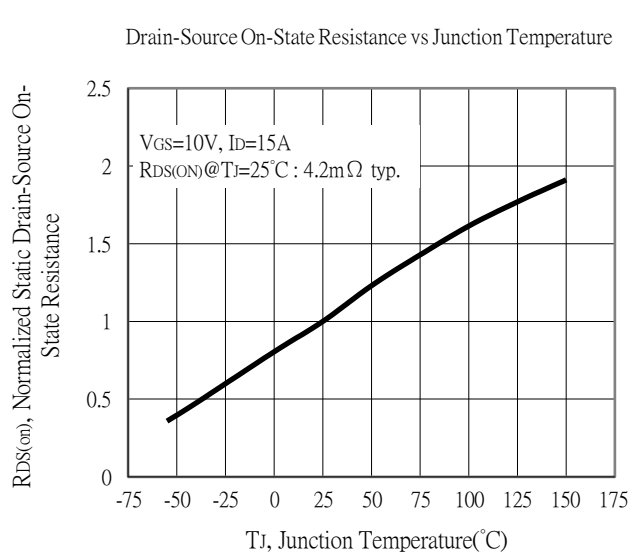
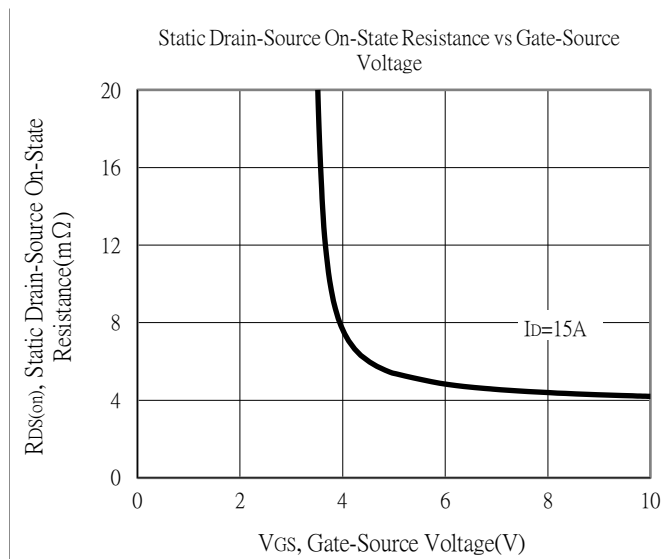
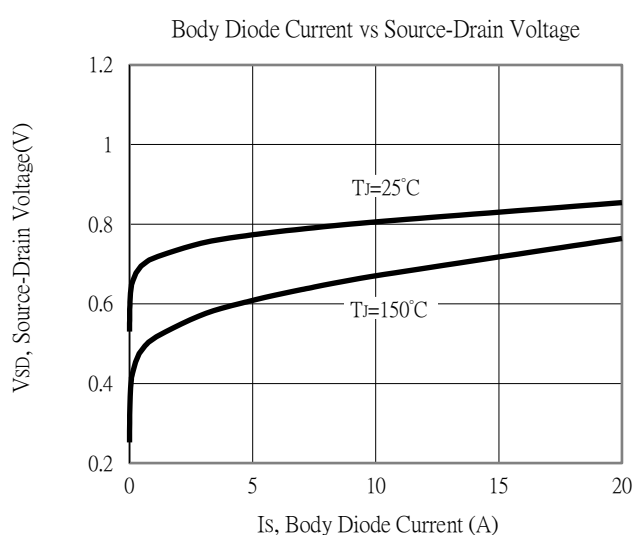
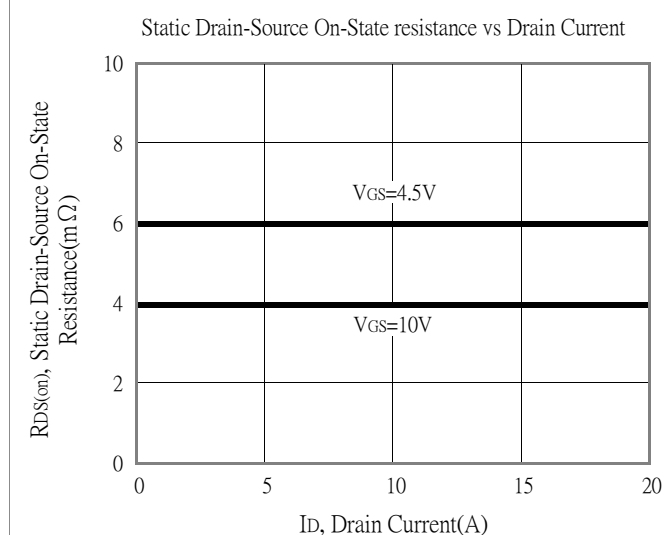
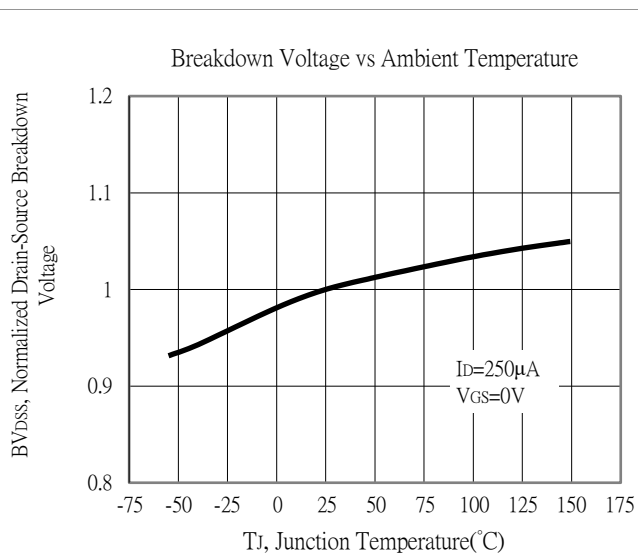
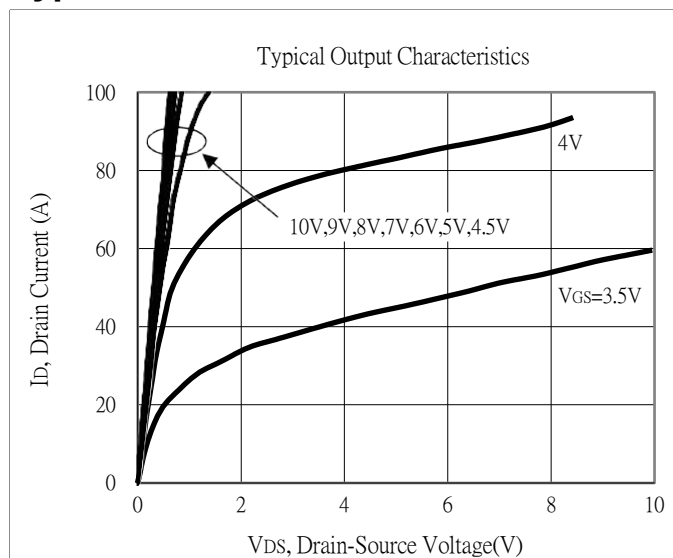
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	30	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	25	-	S	V _{DS} =5V, I _D =15A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0V
R _{DS(ON)}	-	4.2	5.5	mΩ	V _{GS} =10V, I _D =15A
	-	6	8.5		V _{GS} =4.5V, I _D =10A
Dynamic					
C _{iss}	-	1040	-	pF	V _{DS} =15V, V _{GS} =0V, f=1MHz
C _{oss}	-	820	-		
C _{rss}	-	67	-		
R _g	-	0.9	-	Ω	f=1MHz
Q _g *1, 2	-	9.3	-	nC	V _{DS} =15V, I _D =15A, V _{GS} =4.5V
Q _g *1, 2	-	19	-		V _{DS} =15V, I _D =15A, V _{GS} =10V
Q _{gs} *1, 2	-	3.6	-		
Q _{gd} *1, 2	-	3.7	-		
t _{d(ON)} *1, 2	-	11	-	ns	V _{DS} =15V, I _D =15A, V _{GS} =10V, R _{GS} =2.7Ω
t _r *1, 2	-	13	-		
t _{d(OFF)} *1, 2	-	29	-		
t _f *1, 2	-	6	-		
Source-Drain Diode					
V _{SD} *1	-	0.83	1.2	V	I _S =15A, V _{GS} =0V
t _{rr}	-	26	-	ns	I _F =15A, dI _F /dt=100A/μs
Q _{rr}	-	12	-	nC	

Note:

*1. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

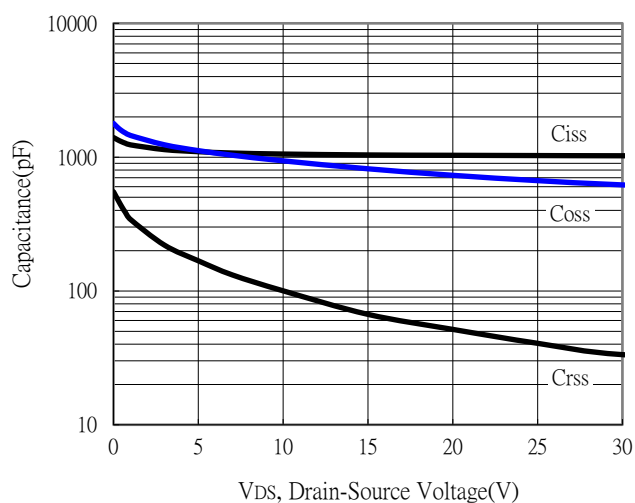
*2. Independent of operating temperature

Typical Characteristics

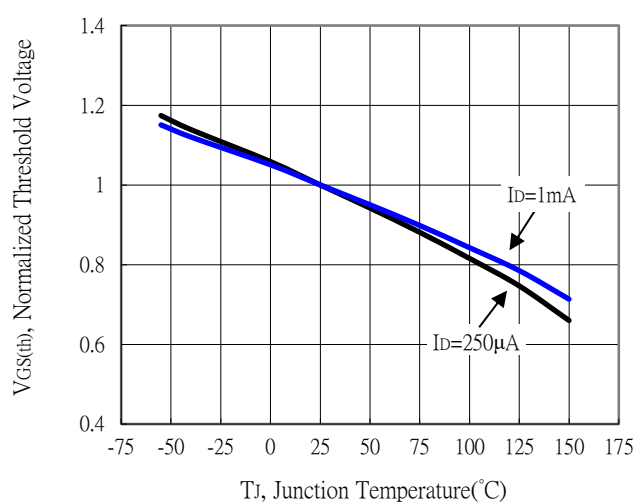


Typical Characteristics (Cont.)

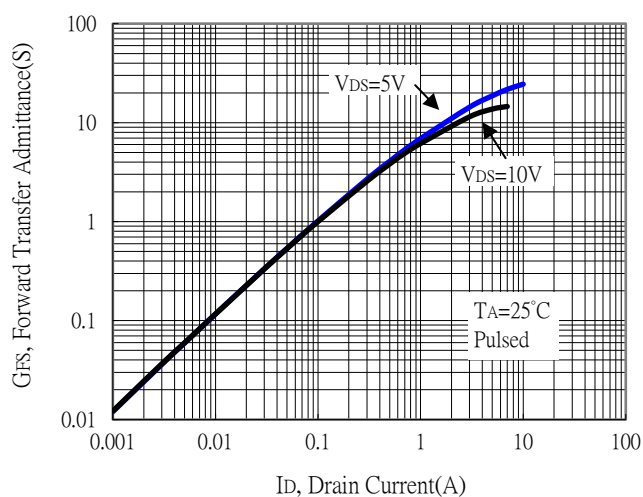
Capacitance vs Drain-to-Source Voltage



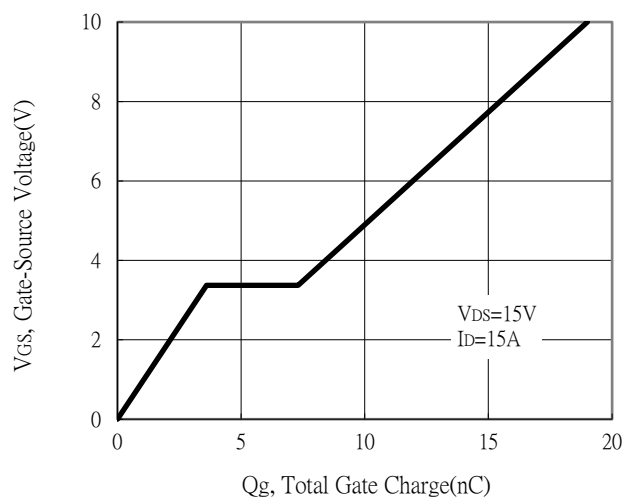
Threshold Voltage vs Junction Temperature



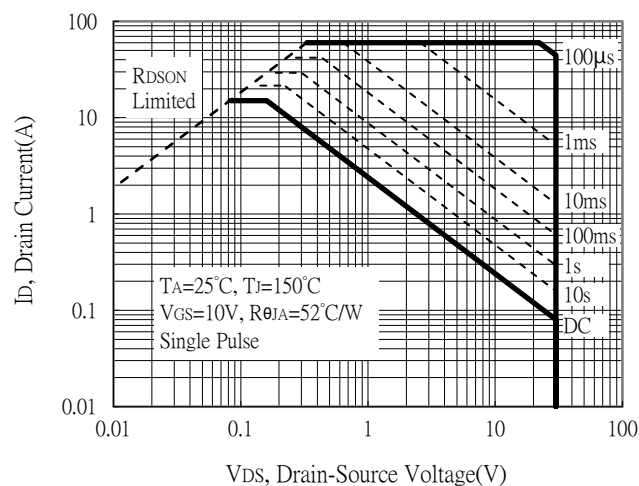
Forward Transfer Admittance vs Drain Current



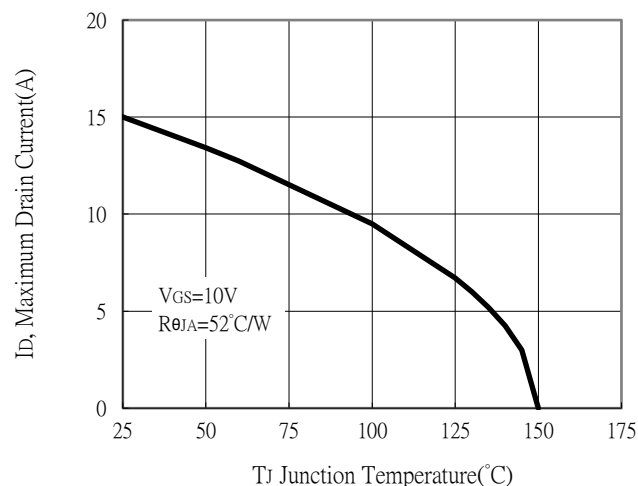
Gate Charge Characteristics



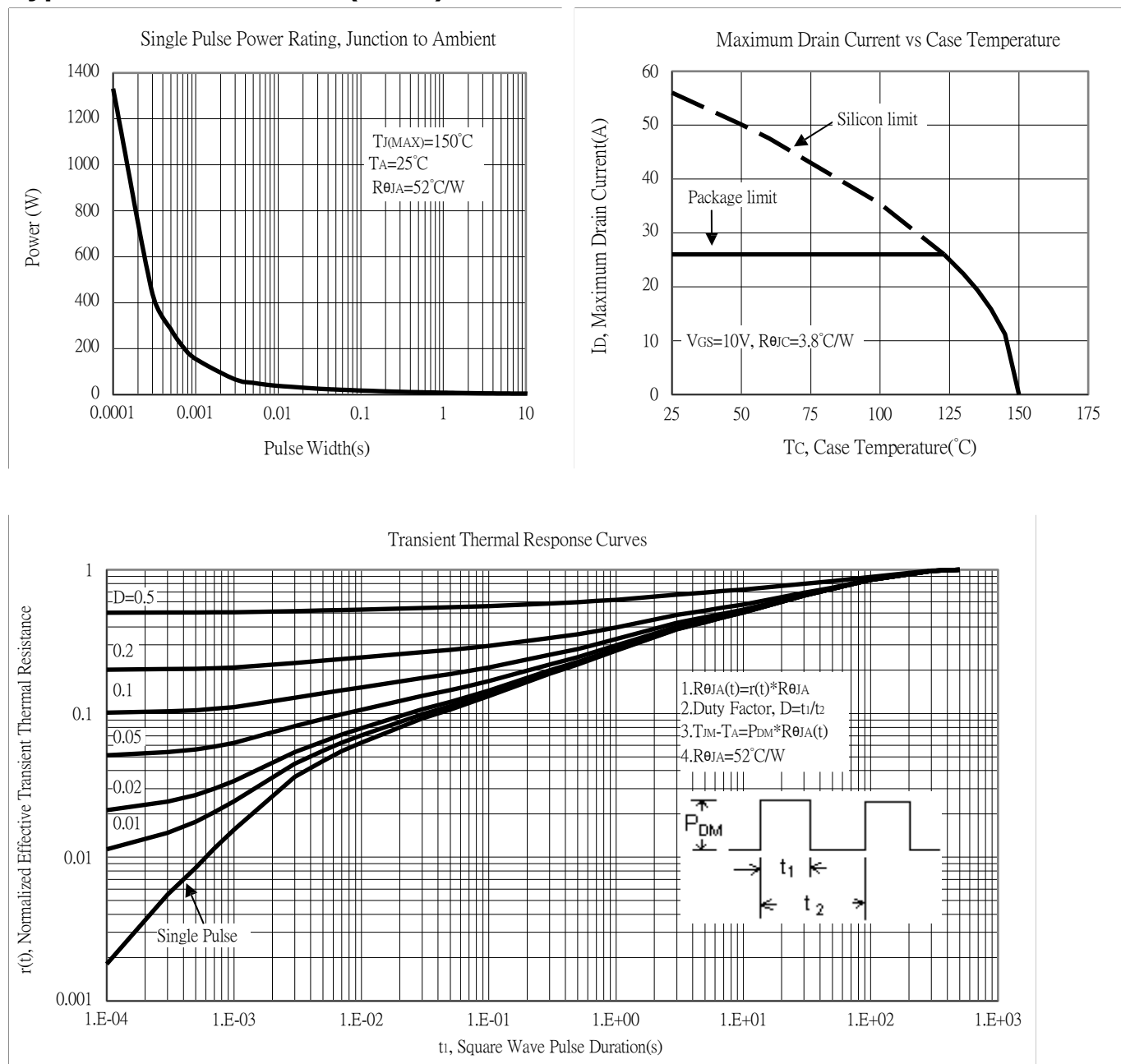
Maximum Safe Operating Area



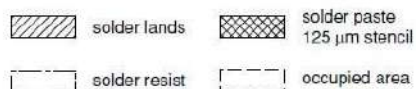
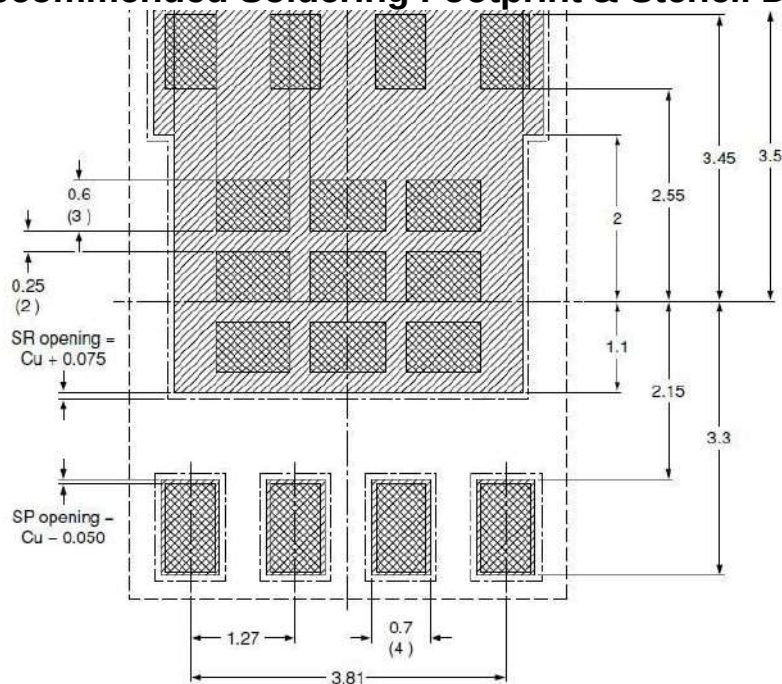
Maximum Drain Current vs Junction Temperature



Typical Characteristics (Cont.)

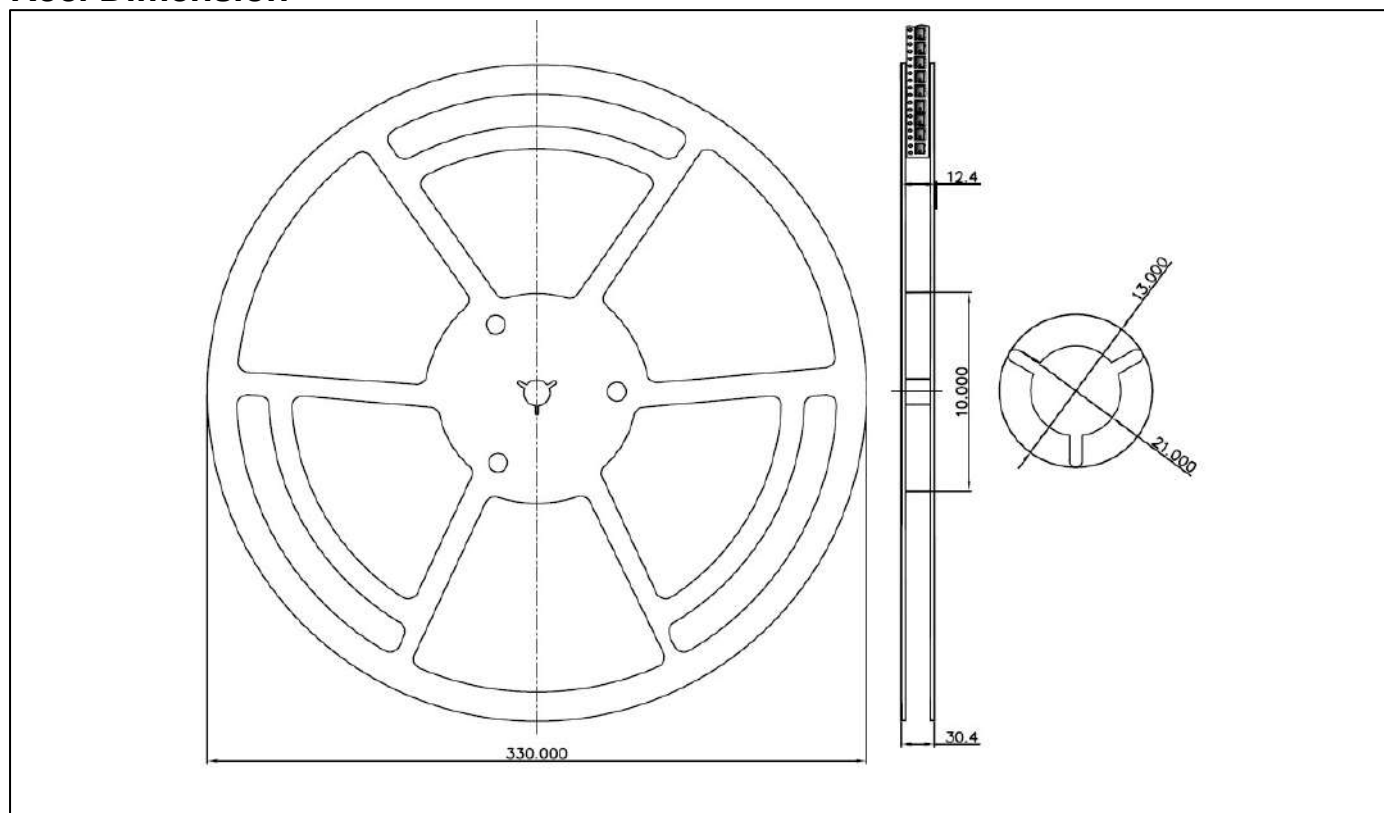


Recommended Soldering Footprint & Stencil Design

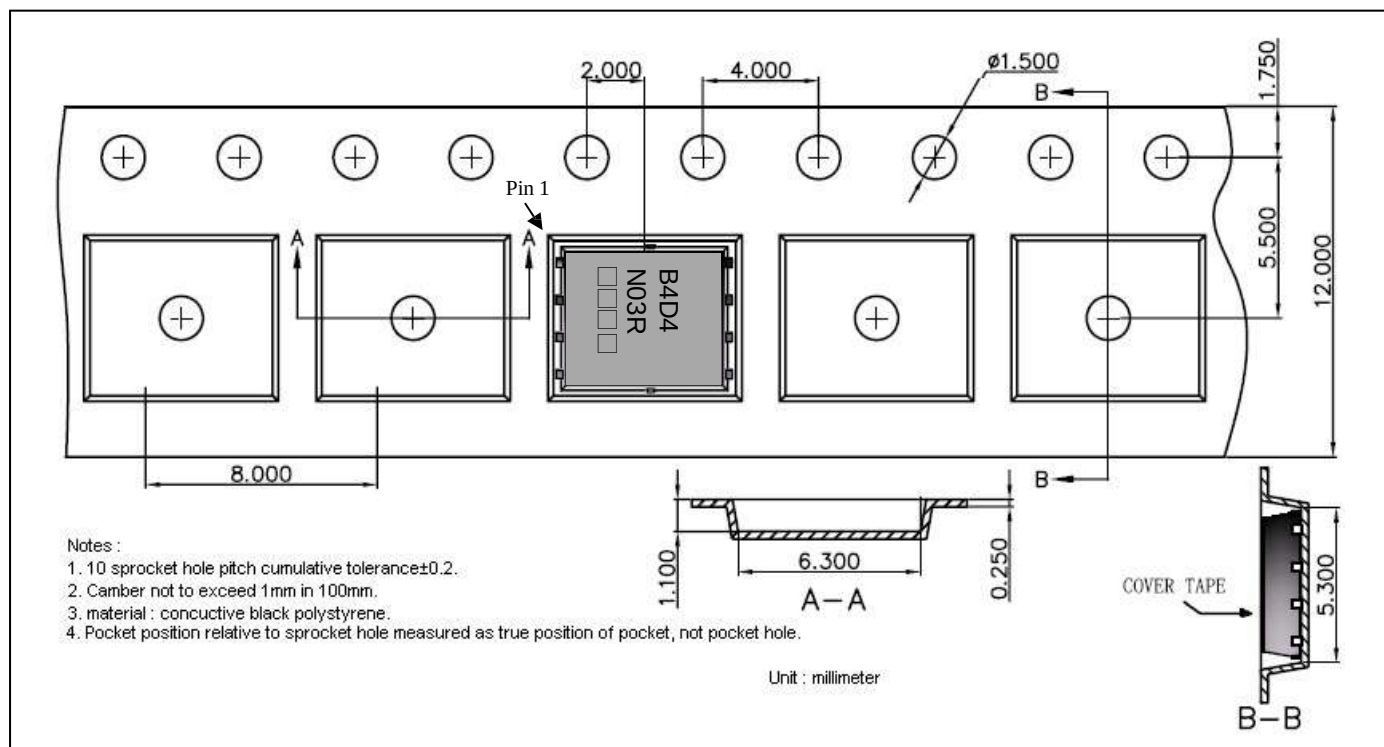


unit : mm

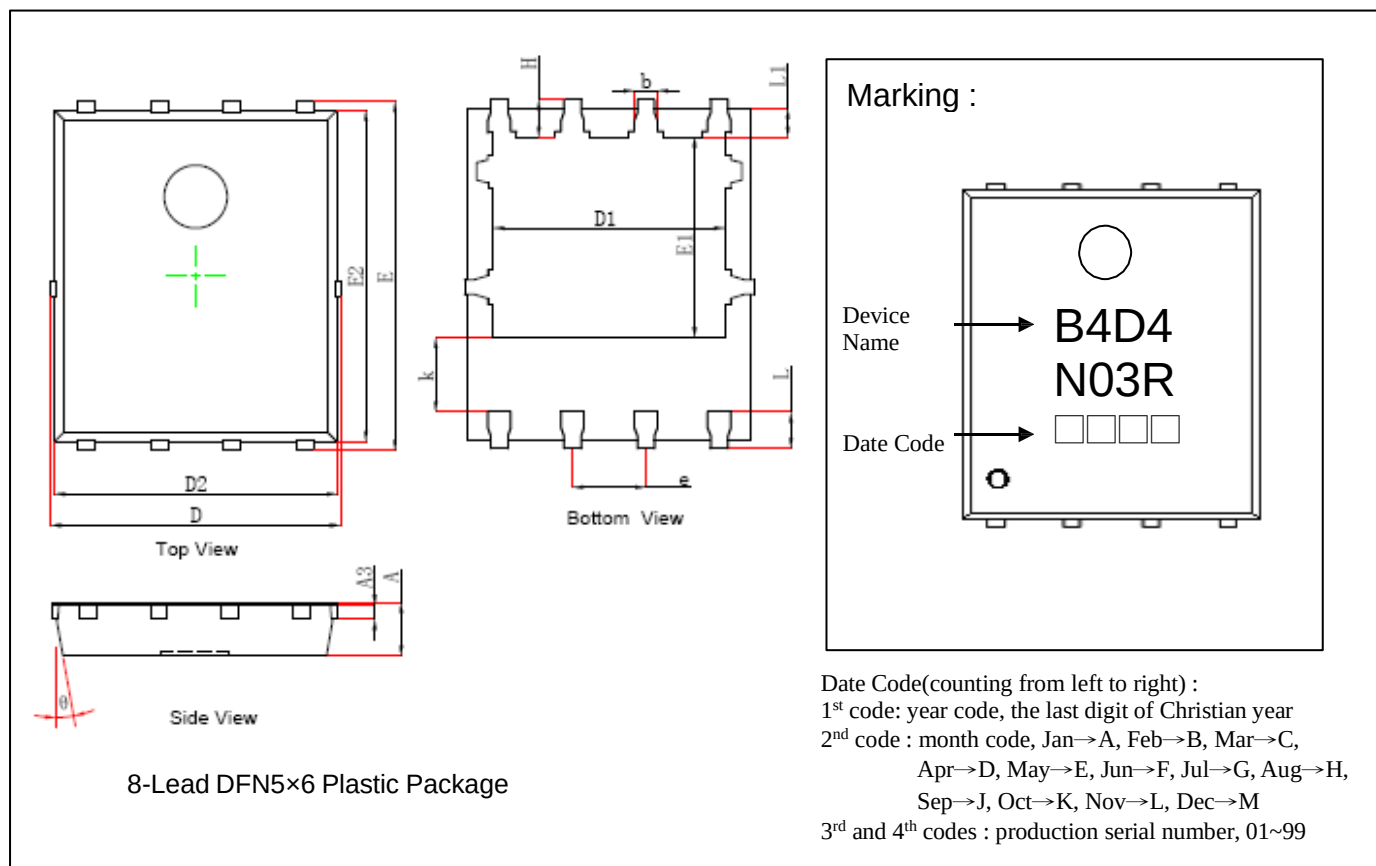
Reel Dimension



Carrier Tape Dime



DFN5x6 Dimension



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039	k	1.190	1.390	0.047	0.055
A3	0.254 REF		0.010 REF		b	0.350	0.450	0.014	0.018
D	4.944	5.096	0.195	0.201	e	1.270	TYP.	0.050	TYP.
E	5.974	6.126	0.235	0.241	L	0.559	0.711	0.020	0.028
D1	3.910	4.110	0.154	0.162	L1	0.424	0.576	0.017	0.023
E1	3.375	3.575	0.133	0.141	H	0.574	0.726	0.023	0.029
D2	4.824	4.976	0.190	0.196	θ	8°	12°	8°	12°
E2	5.674	5.826	0.223	0.229					