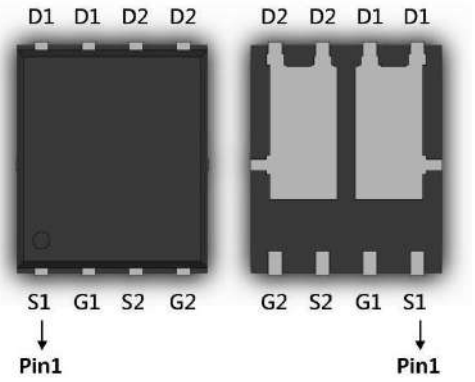
Dual N-Channel Enhancement Mode Power MOSFET

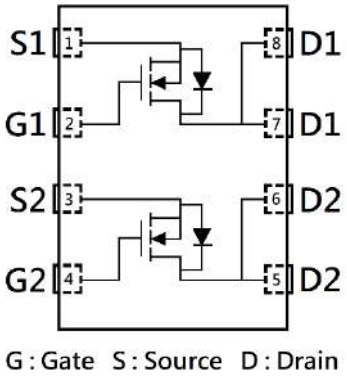
Features:

- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic

DFN5×6



BV_{DSS}	30V
I_D@V_{GS}=10V, T_C=25°C	27A
I_D@V_{GS}=10V, T_A=25°C	8.4A
$R_{DS(ON)typ.}$@V_{GS}=10V, I_D=8A	11mΩ
$R_{DS(ON)typ.}$@V_{GS}=4.5V, I_D=6A	16mΩ



Ordering Information

Device	Package	Shipping
KPRB012A03	DFN5×6 (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	*a	I_D	27	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		17	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		8.4	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		6.7	
Pulsed Drain Current	*c	I_{DM}	80	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	19	
Avalanche Current @ L=0.1mH		I_{AS}	15	
Avalanche Energy @ L=0.5mH		E_{AS}	16	mJ
Total Power Dissipation	T_C=25℃ *a	P_D	23	W
	T_C=100℃ *a		9.4	
	T_A=25°C *b		2.2	
	T_A=70°C *b		1.4	
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		$R_{\theta JC}$	5.3	°C/W
Thermal Resistance, Junction-to-ambient	*b	$R_{\theta JA}$	57	

Note:

*a. The power dissipation P_D is based on $T_{J(MAX)}$=150℃, 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 $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR -4 board with 2 oz. copper, in a still air environment with T_A=25℃. The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150℃. 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℃. Ratings are based on low frequency and low duty cycles to keep initial T_J=25℃.

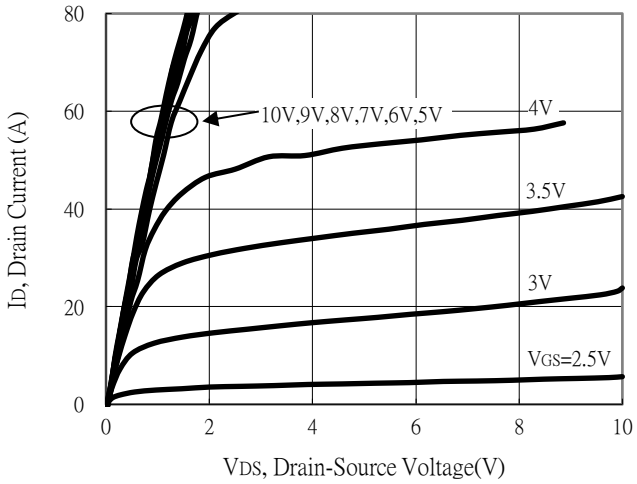
Electrical Characteristics (T_A=25°C, unless otherwise specified)

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}	-	6.3	-	S	V_{DS}=10V, I_D=3A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0V
$R_{DS(ON)}$	-	11	15	mΩ	V_{GS}=10V, I_D=8A
	-	16	23		V_{GS}=4.5V, I_D=6A
Dynamic					
Ciss	-	790	-	pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Coss	-	110	-		
Crss	-	85	-		
Rg	-	4	-	Ω	f=1MHz
Qg *1, 2	-	19	-	nC	V_{DS}=15V, I_D=8A, V_{GS}=10V
Qgs *1, 2	-	2.8	-		
Qgd *1, 2	-	4	-		
$t_{d(ON)}$ *1, 2	-	8	-	ns	V_{DS}=15V, I_D=8A, V_{GS}=10V, R_{GS}=1Ω
tr *1, 2	-	17	-		
$t_{d(OFF)}$ *1, 2	-	40	-		
t_f *1, 2	-	9	-		
Source-Drain Diode					
V_{SD} *1	-	0.84	1.2	V	I_S=8A, V_{GS}=0V
trr	-	9	-	ns	I_F=8A, dI_F/dt=100A/μs
Qrr	-	4	-	nC	

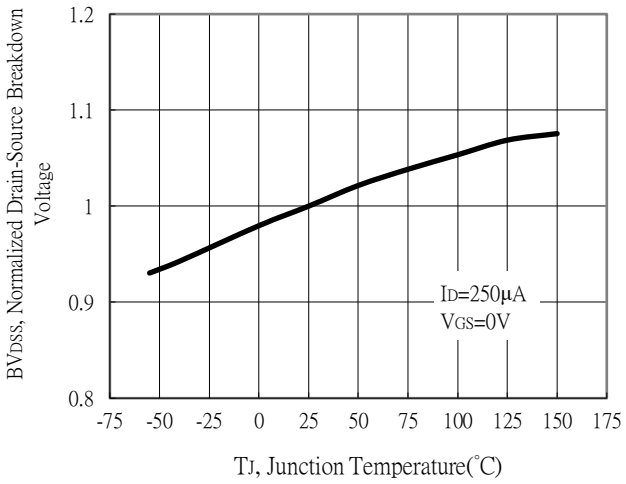
Note:
*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2. Independent of operating temperature

Typical Characteristics

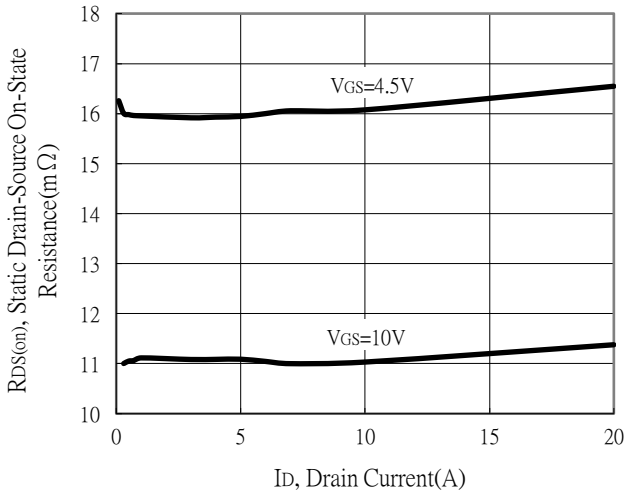
Typical Output Characteristics



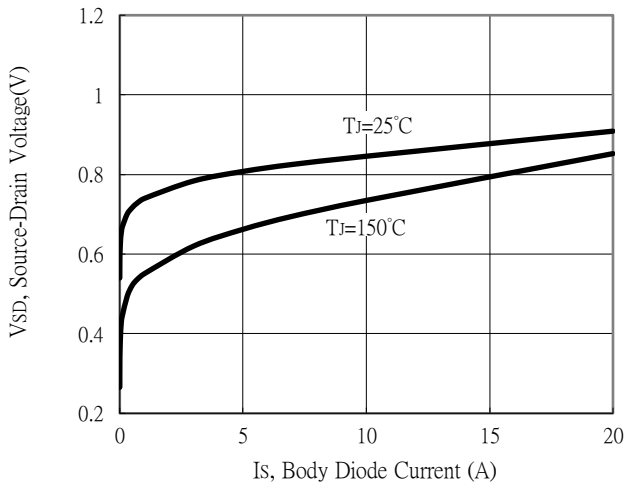
Breakdown Voltage vs Ambient Temperature



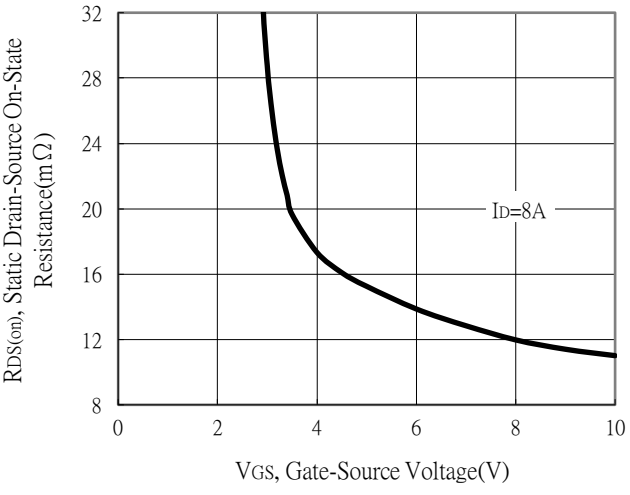
Static Drain-Source On-State resistance vs Drain Current



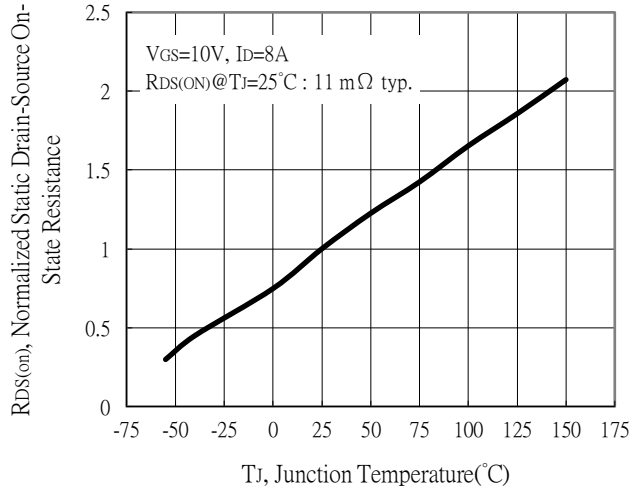
Body Diode Current vs Source-Drain Voltage



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

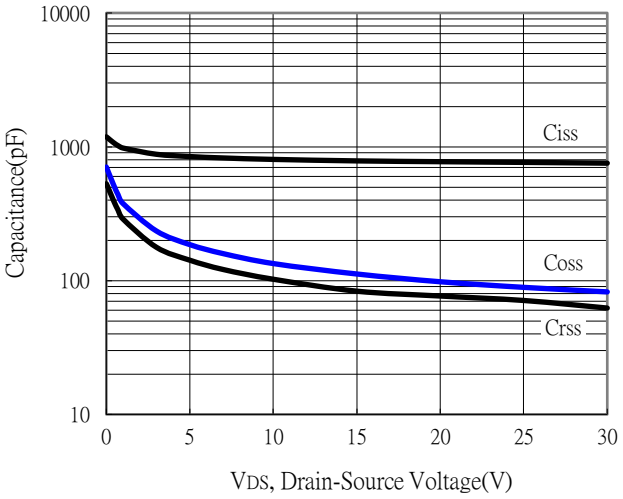


Drain-Source On-State Resistance vs Junction Temperature

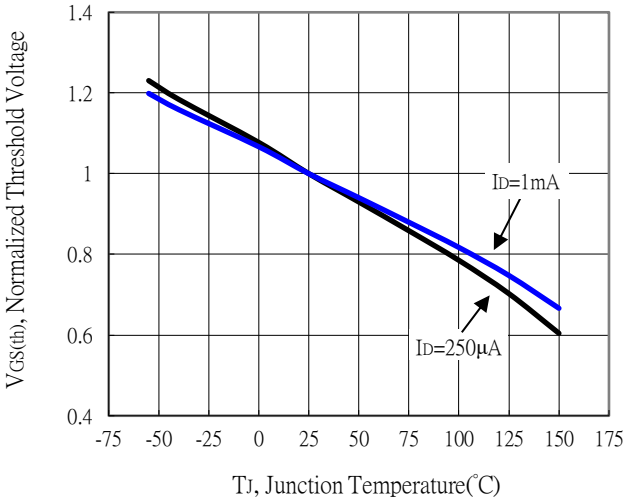


Typical Characteristics (Cont.)

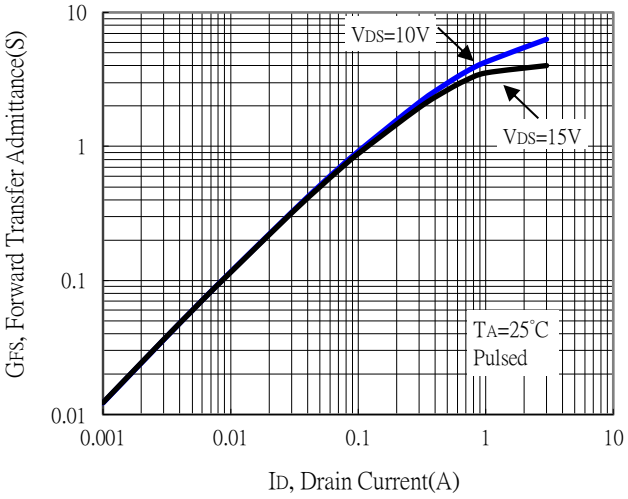
Capacitance vs Drain-to-Source Voltage



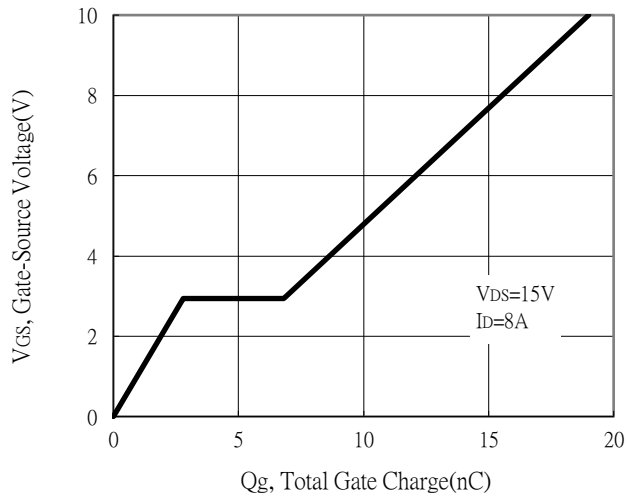
Threshold Voltage vs Junction Temperature



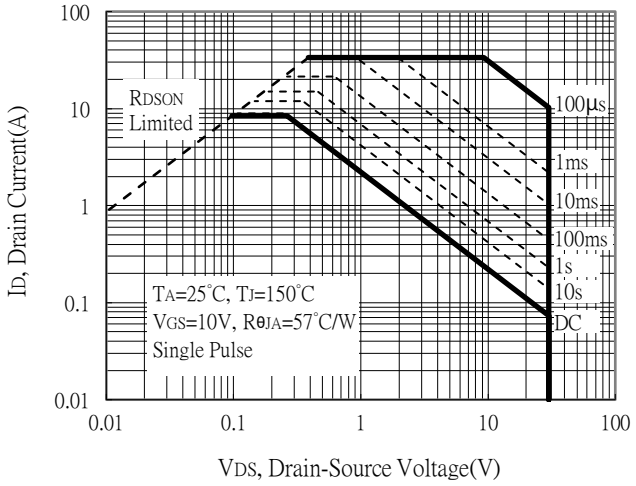
Forward Transfer Admittance vs Drain Current



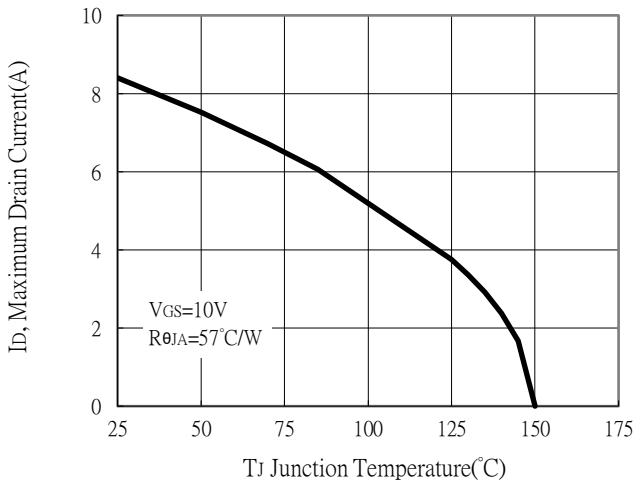
Gate Charge Characteristics



Maximum Safe Operating Area

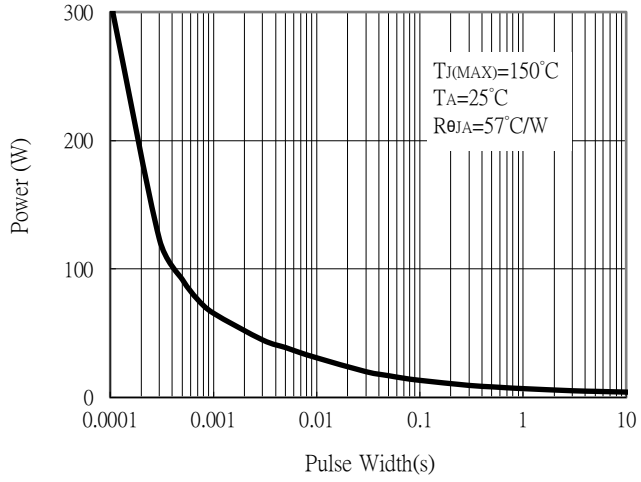


Maximum Drain Current vs Junction Temperature

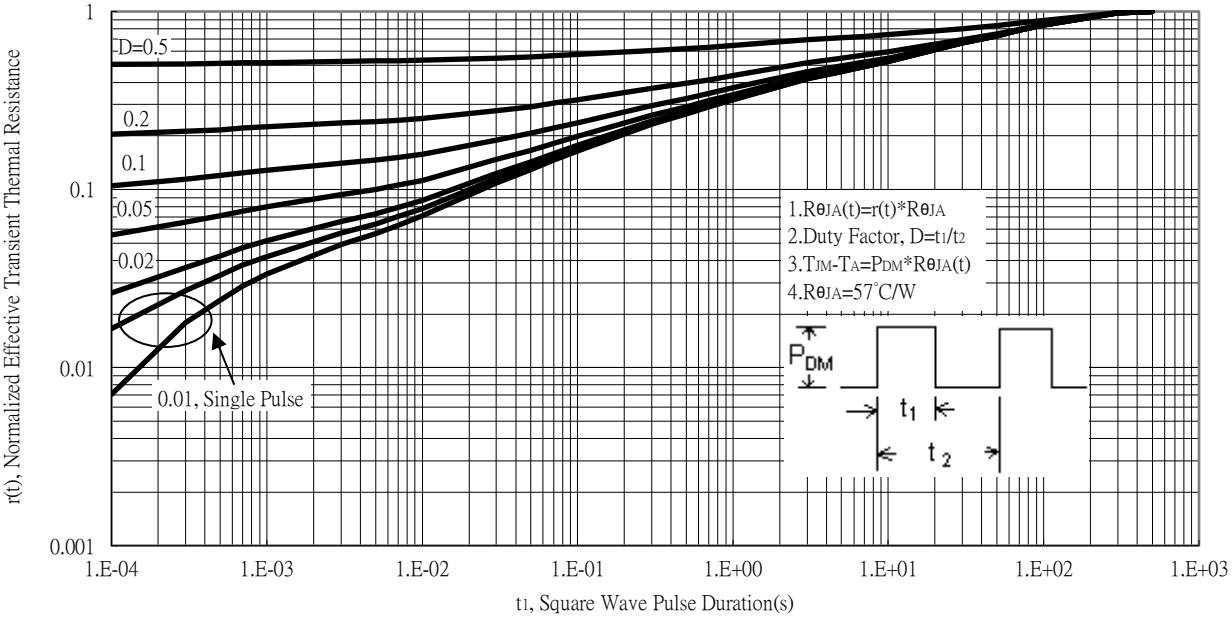


Typical Characteristics (Cont.)

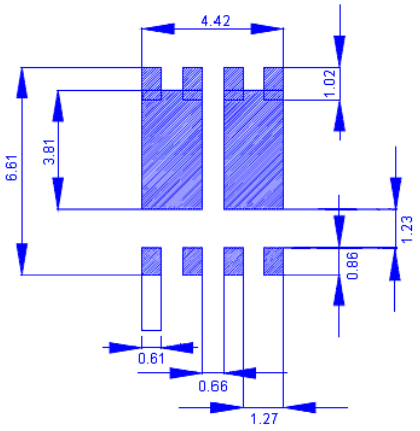
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

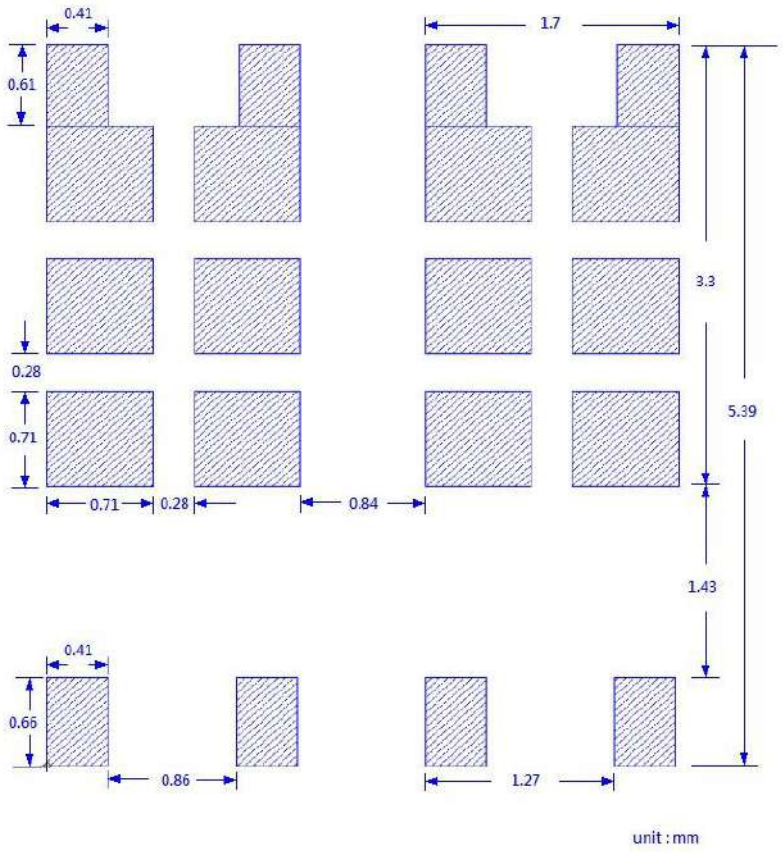


Recommended Soldering Footprint



Unit : mm

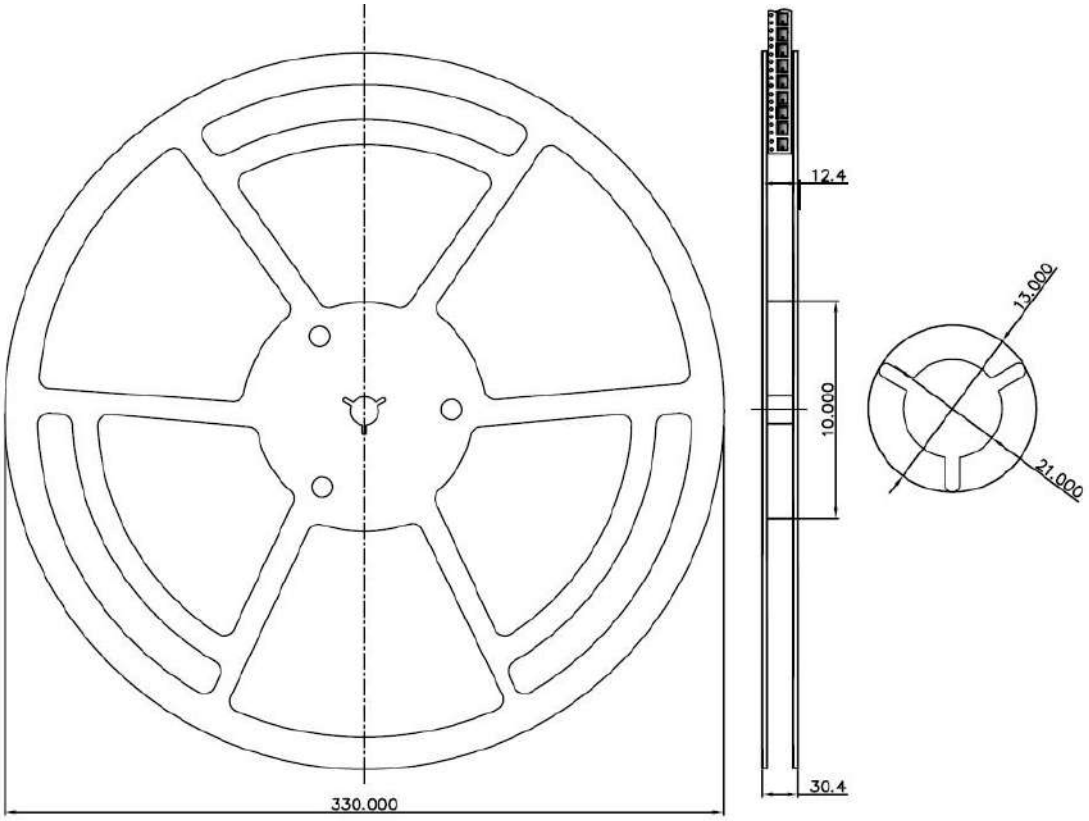
Recommended Stencil Design



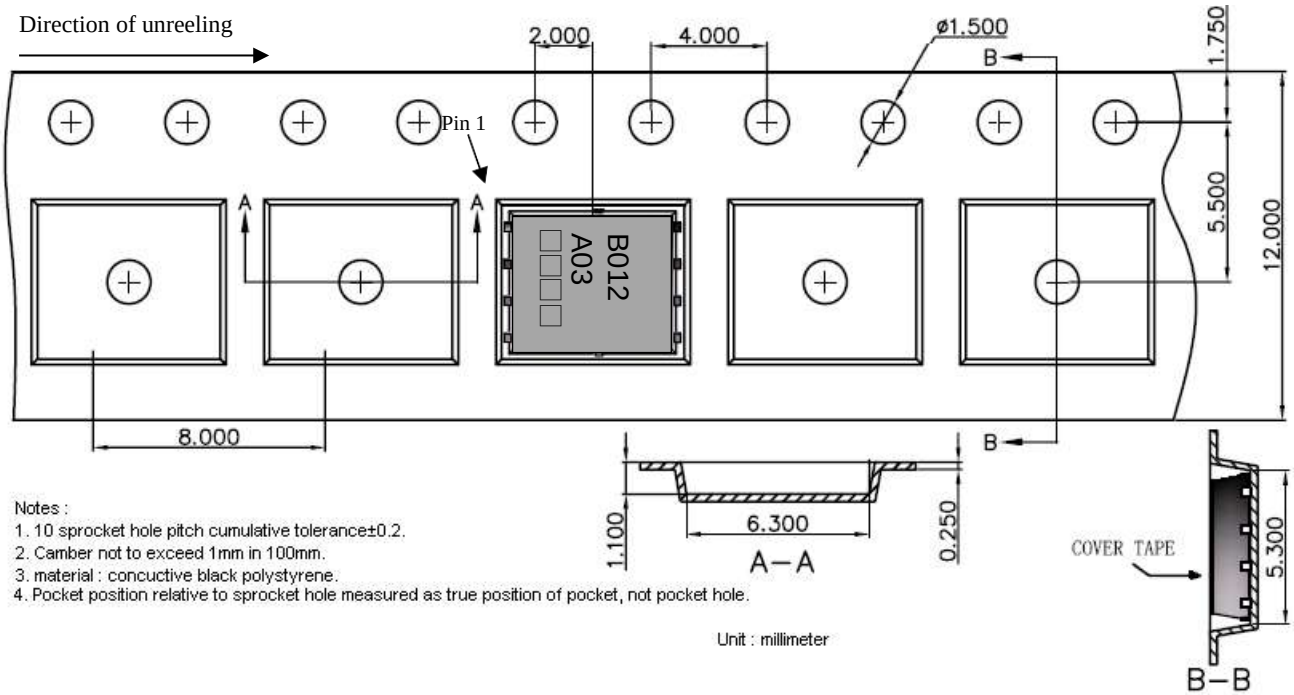
Note : 1. Stencil thickness 5 mil (0.127mm)

2. May need to be adjusted to specific requirements.

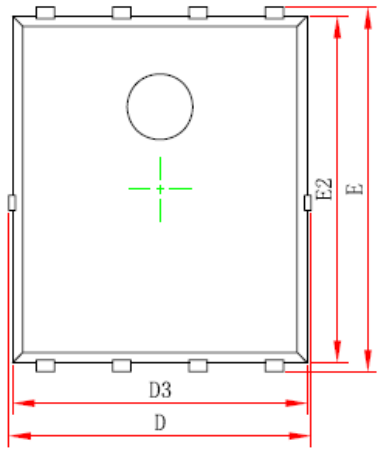
Reel Dimension



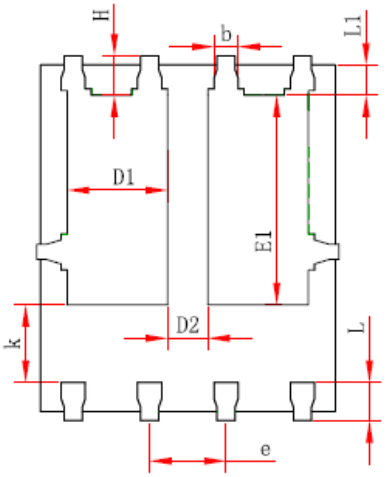
Carrier Tape Dimension



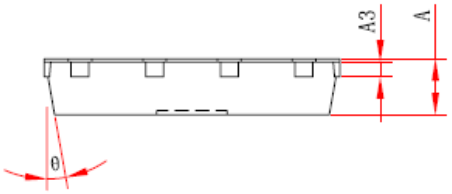
DFN5x6 Dimension



Top View

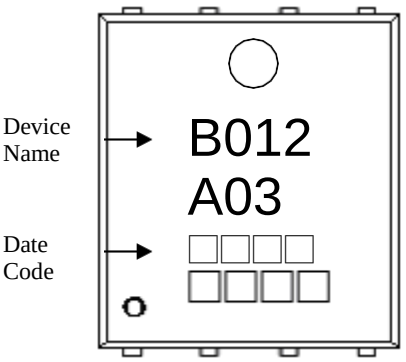


Bottom View



Side View

Marking:



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

8-Lead power pak Plastic Package

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039	E2	5.674	5.826	0.223	0.229
A3	0.254	REF	0.010	REF	k	1.190	1.390	0.047	0.055
D	4.944	5.096	0.195	0.201	b	0.350	0.450	0.014	0.018
E	5.974	6.126	0.235	0.241	e	1.270	TYP	0.050	TYP
D1	1.470	1.870	0.058	0.074	L	0.559	0.711	0.022	0.028
D2	0.470	0.870	0.019	0.034	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
D3	4.824	4.976	0.190	0.196	θ	10°	12°	10°	12°