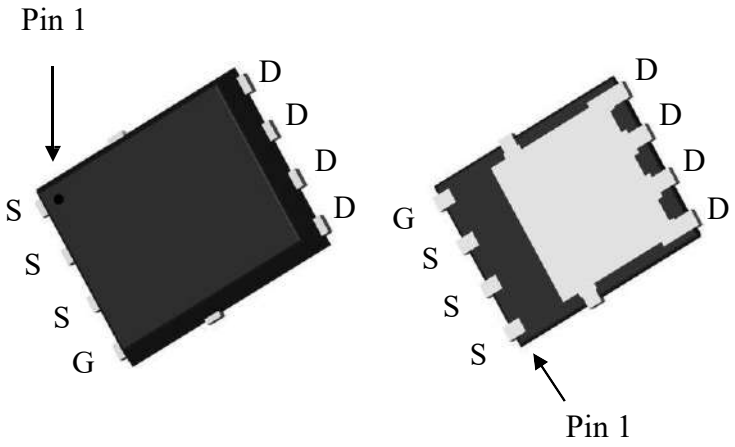
N-Channel Logic Level Enhancement Mode Power MOSFET

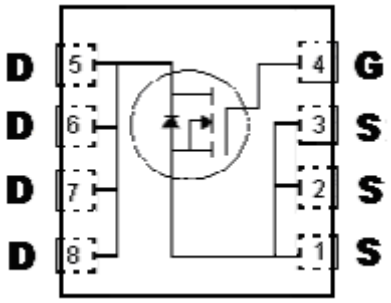
DFN5x6



Features:

- Single 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_C=25°C	**60A**
I_D@V_{GS}=10V, T_A=25°C	**19.2A**
$R_{DS(ON)}$@V_{GS}=10V, I_D=30A	**2.5 mΩ(typ)**
$R_{DS(ON)}$@V_{GS}=4.5V, I_D=24A	**3.5 mΩ(typ)**



G：Gate D：Drain S：Source

Ordering Information

Device	Package	Shipping
KWB3D0N03BH8	DFN 5 ×6 (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	86	A
Continuous Drain Current @ T_C=100°C, V_{GS}=10V(Silicon limit)			54	
Continuous Drain Current @ T_C=25°C, V_{GS}=10V(Package limit)			60	
Continuous Drain Current @ T_A=25°C, V_{GS}=10V		I_{DSM}	19.2 *3	
Continuous Drain Current @ T_A=70°C, V_{GS}=10V			15.4 *3	
Pulsed Drain Current		I_{DM}	200 *1	
Avalanche Current		I_{AS}	46	
Avalanche Energy @ L=0.1mH, I_D=46A, R_G=25Ω		E_{AS}	106	mJ
Total Power Dissipation	T_C=25℃	P_D	50	W
	T_C=100℃		20	
	T_A=25℃	P_{DSM}	2.5 *3	
	T_A=70℃		1.6 *3	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

100% UIS testing in condition of V_D=15V, L=0.1mH, V_G=10V, I_L=30A, Rated V_{DS}=30V N-CH

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	50 *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.

Characteristics (T_C=25°C, unless otherwise specified)

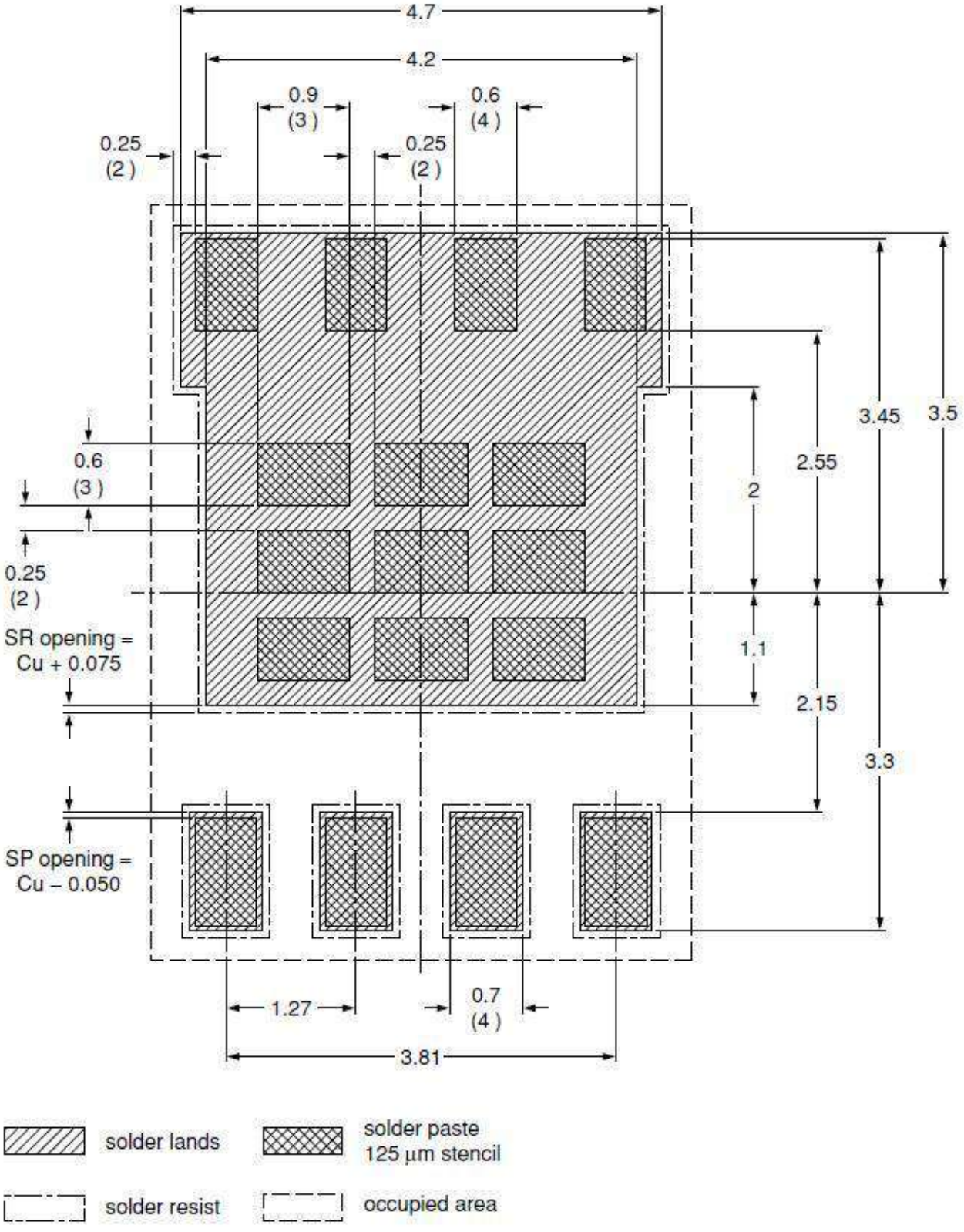
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1.0	-	2.5		V_{DS} = V_{GS}, I_D=250μA
G_{FS} *1	-	41	-	S	V_{DS} =5V, I_D=20A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =24V, V_{GS} =0V
	-	-	25		V_{DS} =20V, V_{GS} =0V, Tj=125°C
$R_{DS(ON)}$ *1	-	2.5	3.5	mΩ	V_{GS} =10V, I_D=30A
	-	3.5	5.0		V_{GS} =4.5V, I_D=24A
Dynamic					
Ciss	-	2355	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Coss	-	419	-		
Crss	-	232	-		

Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Qg (V_{GS}=10V) *1, 2	-	47.2	-	nC	V_{DS}=15V, V_{GS}=10V, I_D=30A
Qg (V_{GS}=4.5V) *1, 2	-	24	-		
Qgs *1, 2	-	8.3	-		
Qgd *1, 2	-	10.2	-		
$t_{d(ON)}$ *1, 2	-	16.4	-	ns	V_{DS}=15V, I_D=24A, V_{GS}=10V, R_{GS}=2.7Ω
tr *1, 2	-	19.2	-		
$t_{d(OFF)}$ *1, 2	-	53.4	-		
t_f *1, 2	-	12.2	-		
Rg	-	0.76	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	60	A	
I_{SM} *3	-	-	200		
V_{SD} *1	-	0.81	1.2	V	I_S=20A, V_{GS}=0V
trr	-	16.1	-	ns	I_F=24A, dI_F/dt=100A/μs
Qrr	-	8.4	-	nC	

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

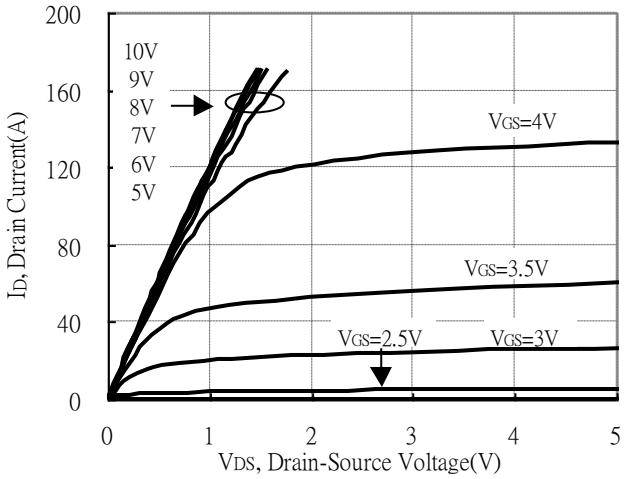
Recommended Soldering Footprint & Stencil Design



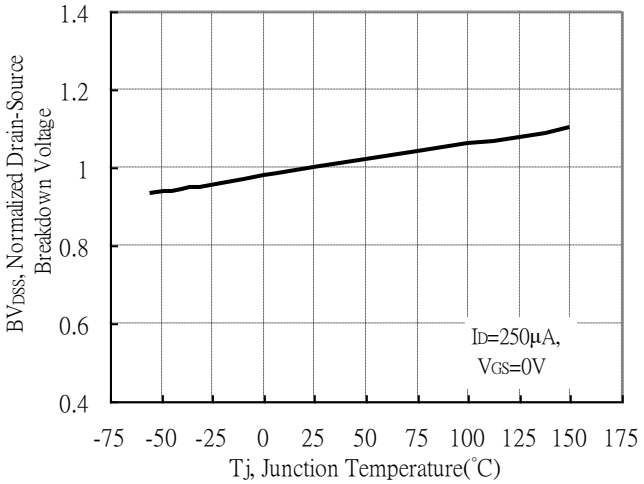
unit : mm

Typical Characteristics

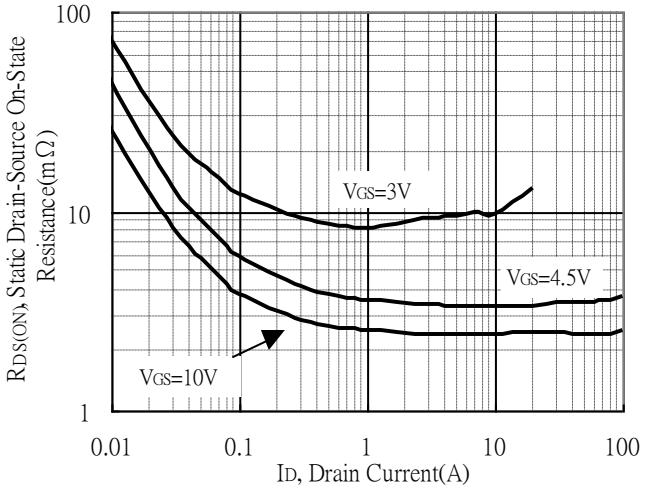
Typical Output Characteristics



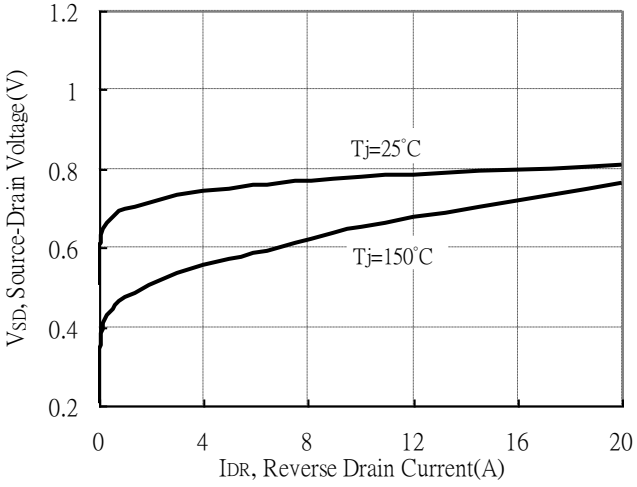
Brekdown Voltage vs Ambient Temperature



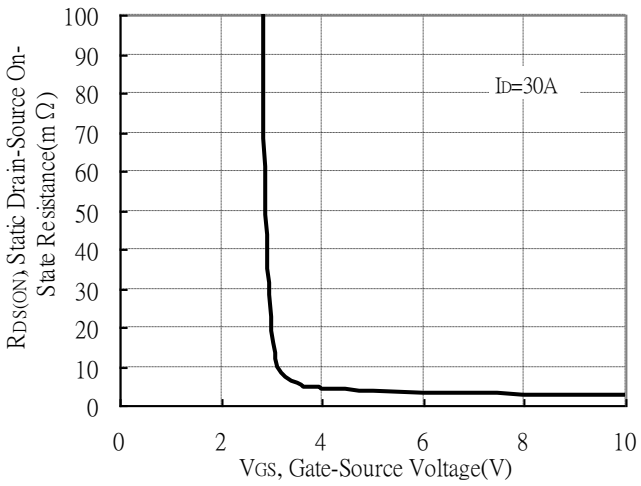
Static Drain-Source On-State resistance vs Drain Current



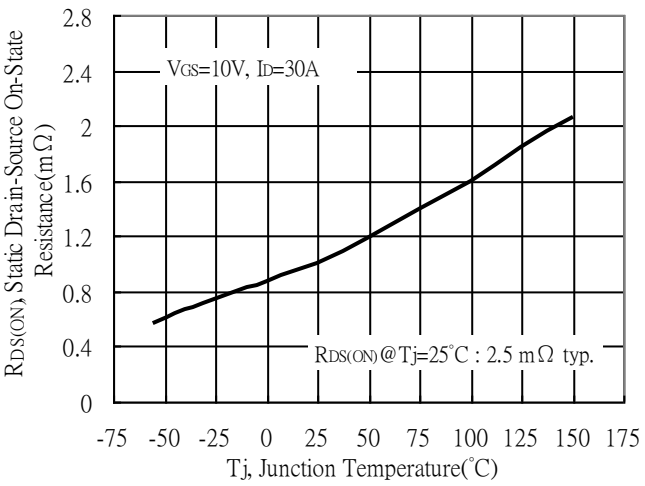
Reverse Drain Current vs Source-Drain Voltage



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

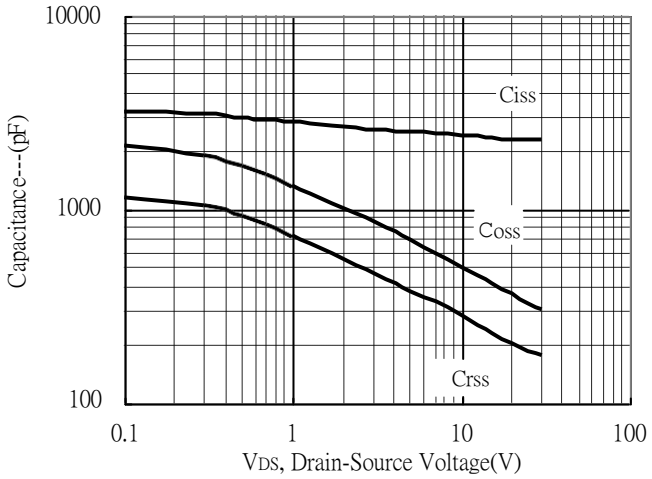


Drain-Source On-State Resistance vs Junction Tempearture

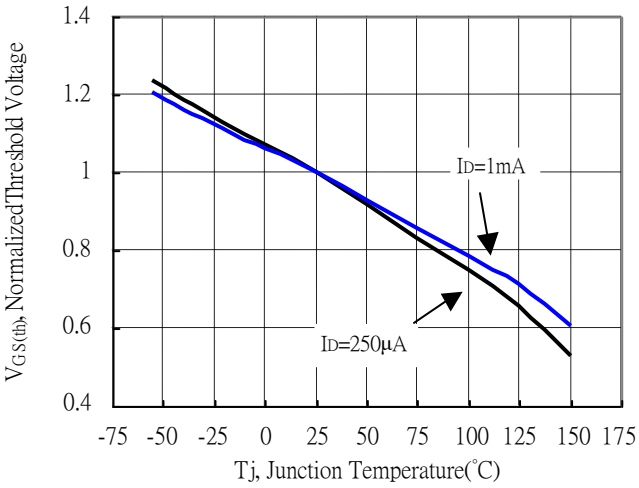


Typical Characteristics(Cont.)

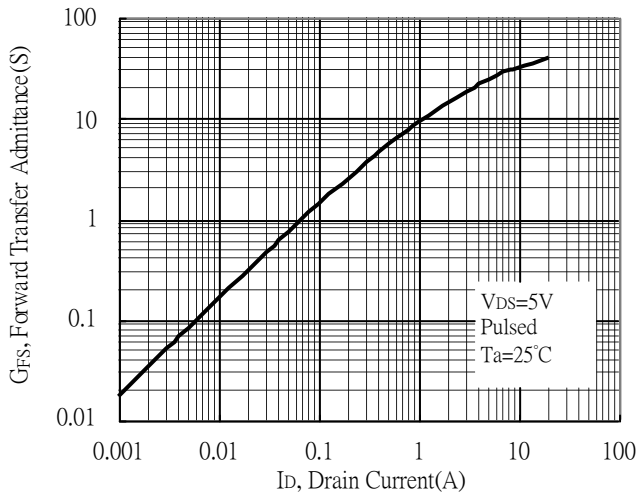
Capacitance vs Drain-to-Source Voltage



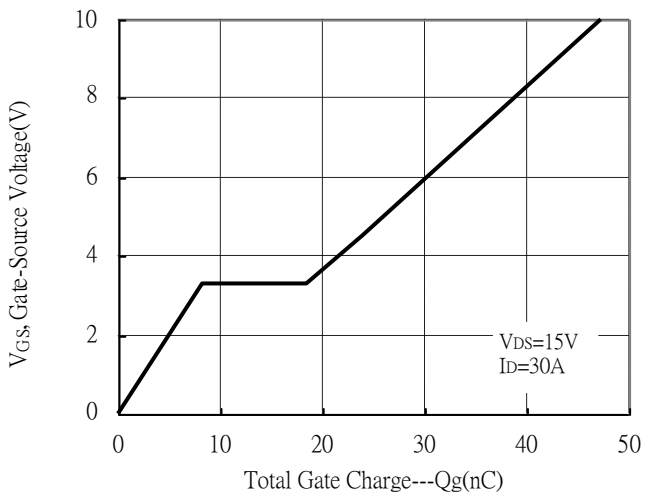
Threshold Voltage vs Junction Tempearture



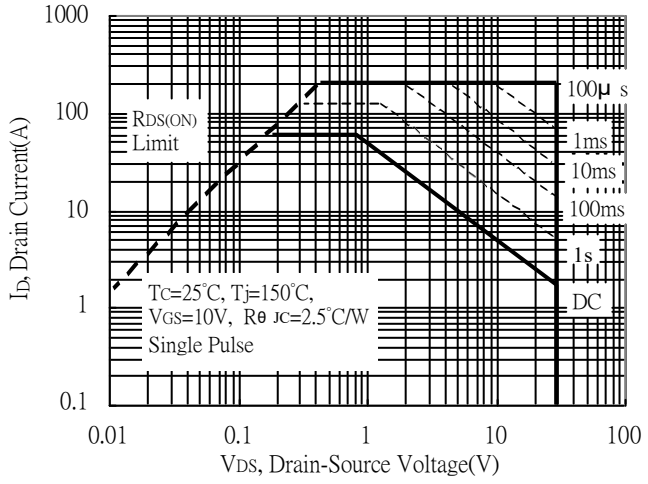
Forward Transfer Admittance vs Drain Current



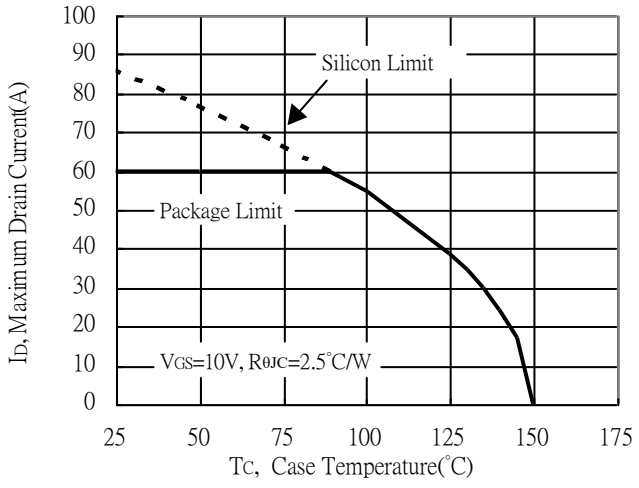
Gate Charge Characteristics



Maximum Safe Operating Area

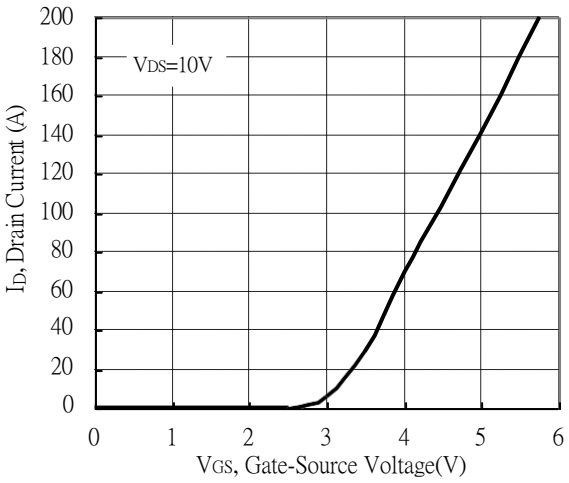


Maximum Drain Current vs Case Temperature

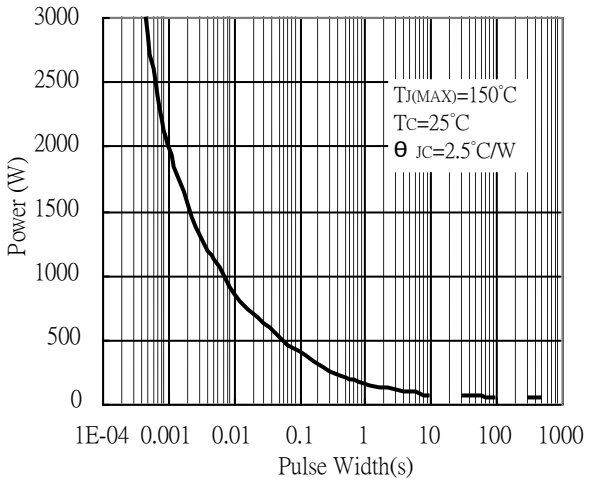


Typical Characteristics(Cont.)

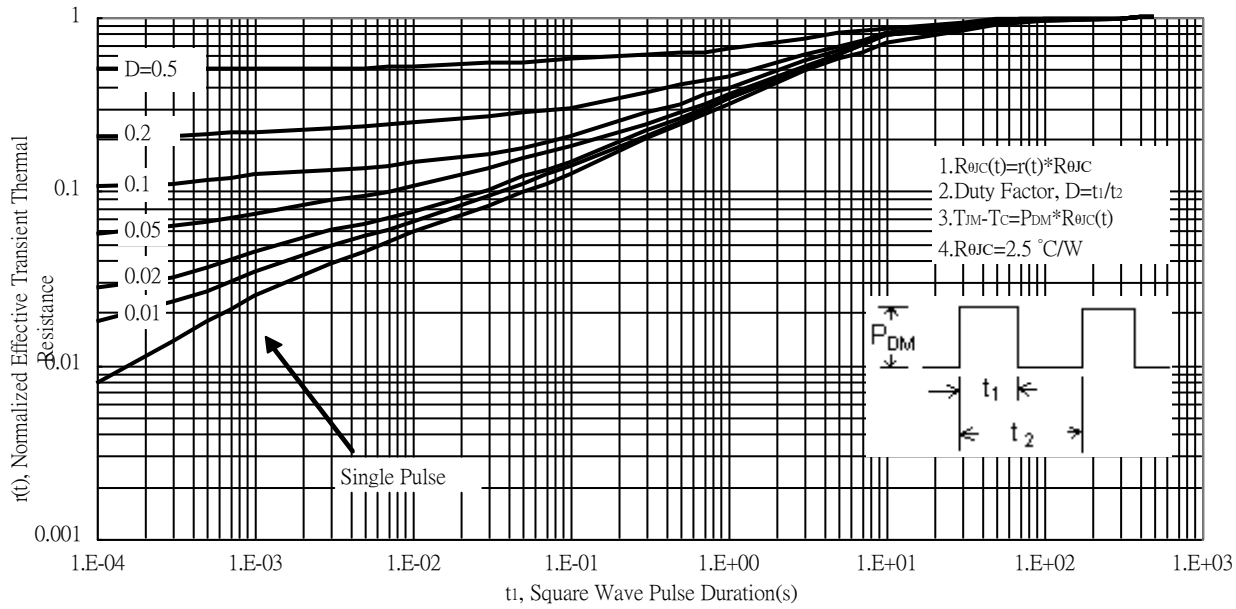
Typical Transfer Characteristics



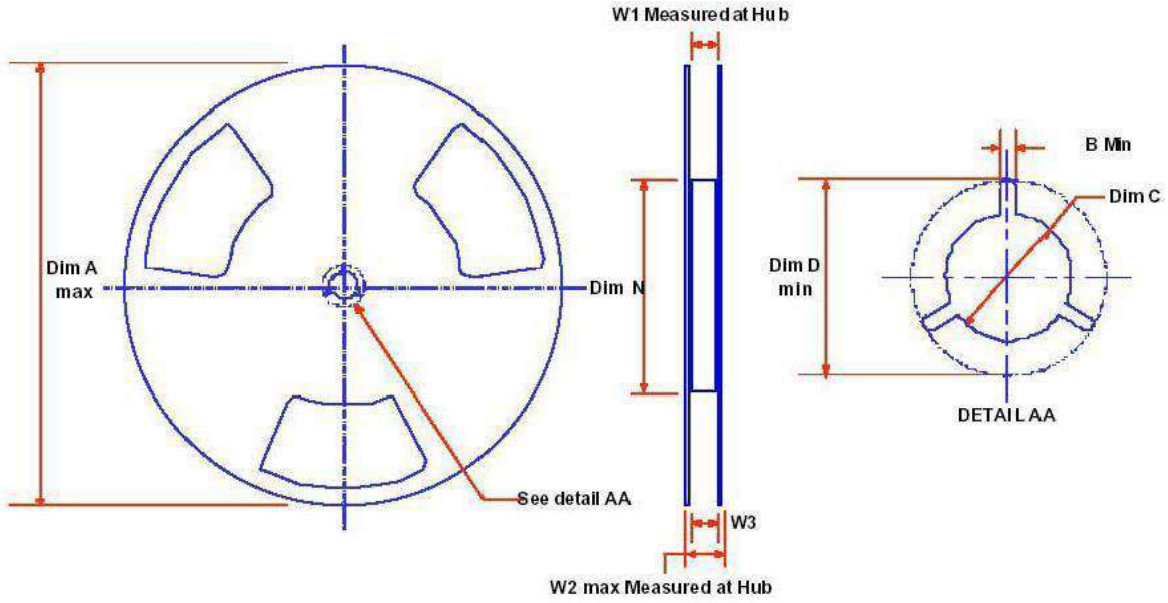
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves



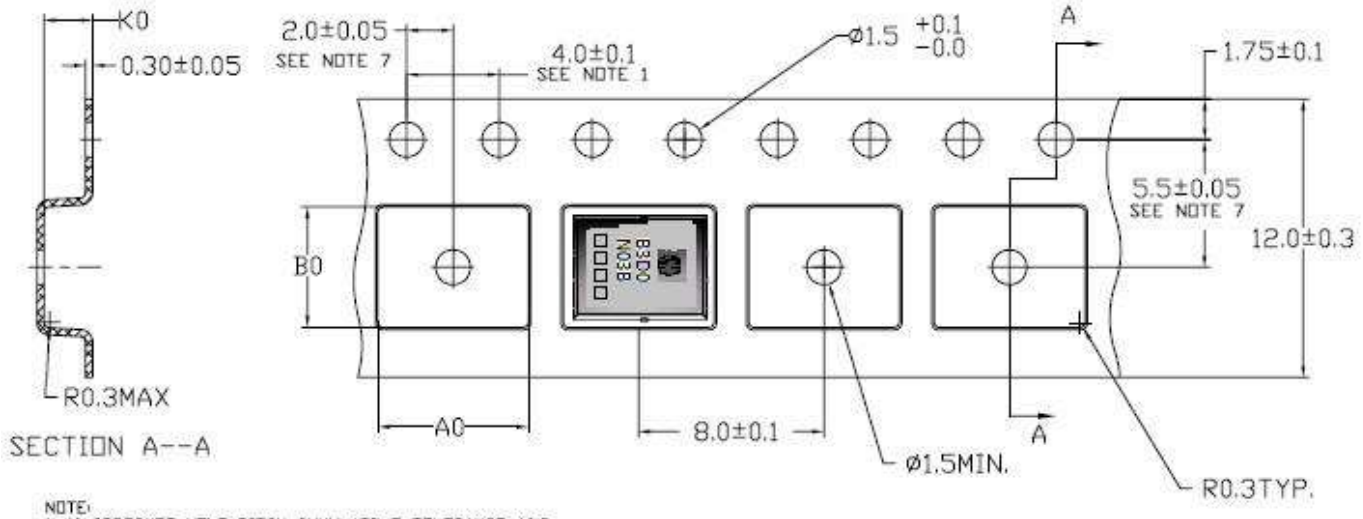
Reel Dimension



Dimensions are in inches and millimeters

Tape Size	Reel Option	Dim A	Dim B	Dim C	Dim D	Dim N	Dim W1	Dim W2	Dim W3 (LSL-USL)
12mm	13" Dia (STD/L99Z)	13.00 330+/-1	0.059 1.5 Min.	0.512 13.0 Min.	0.795 20.2(ref.)	7.00 178+0/-2	0.488 +0.078/-0.000 12.4 +2/0	0.724 18.4(ref.)	0.469 – 0.606 11.9 – 15.4

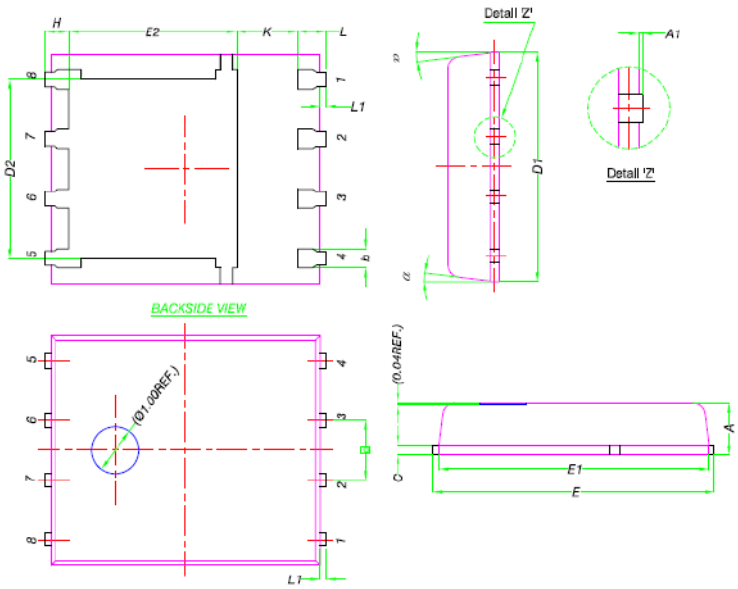
Carrier Tape Dimension



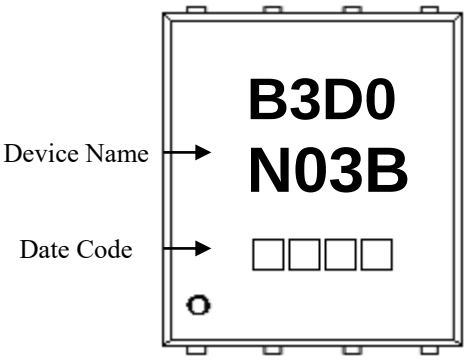
NOTE:
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.2
2. CAMBER NOT TO EXCEED 1mm IN 100mm, NONCUMULATIVE OVER 250mm.
3. MATERIAL: BLACK STATIC DISSIPATIVE PS.(POLYSTYRENE)
4. ALL DIMENSIONS ARE IN MILLIMETERS (UNLESS OTHERWISE SPECIFIED)
5. A0 AND B0 MEASURED ON A PLANE 0.3mm ABOVE THE BOTTOM OF THE POCKET
6. K0 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 POCKET, NOT POCKET HOLE
8. SURFACE RESISTIVITY
   1X10E4~1X10E11 OHMS/SQ.

A0=6.5±0.1
B0=5.3±0.1
K0=1.4±0.1

DFN5x6 Dimension



Marking:



Date Code :
1st digit : year code, last digit of Christian year
2nd digit : 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 digits : serial number of production lot

8-Lead DFN5x6 Plastic Package
Package Code : H8

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043	E2	3.38	3.78	0.133	0.149
A1	0.00	0.05	0.000	0.002	e	1.27 BSC		0.050 BSC	
b	0.33	0.51	0.013	0.020	H	0.41	0.61	0.016	0.024
C	0.20	0.30	0.008	0.012	K	1.10	-	0.043	-
D1	4.80	5.00	0.189	0.197	L	0.51	0.71	0.020	0.028
D2	3.61	3.96	0.142	0.156	L1	0.06	0.20	0.002	0.008
E	5.90	6.10	0.232	0.240	θ	8°	12°	8°	12°
E1	5.70	5.80	0.224	0.228					