

25V N-CHANNEL Enhancement Mode MOSFET

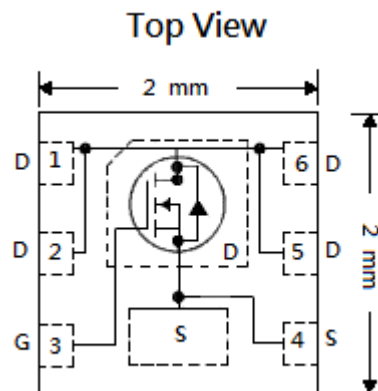
Equivalent Circuit

KWB010N02DFJ6

Features:

- Low on-resistance
- Excellent thermal and electrical capabilities
- Pb-free lead plating and halogen-free package

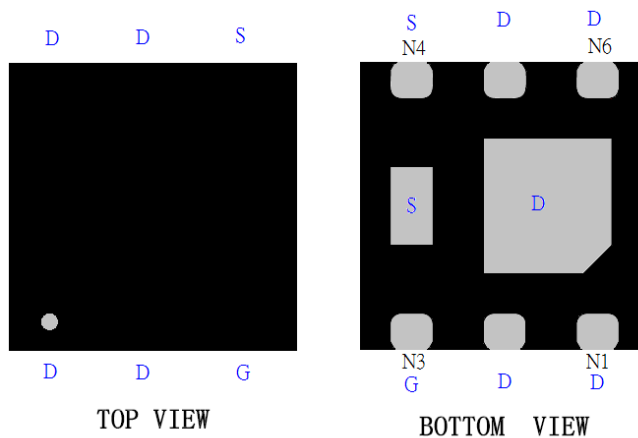
BV_{DSS}	25V	
$I_D@V_{GS}=10V, T_C=25^\circ C$	18.2A	
$I_D@V_{GS}=10V, T_A=25^\circ C$	8.8A	
$R_{DS(on)}@V_{GS}=10V, I_D=8.5A$	10.9m Ω (typ.)	
$R_{DS(on)}@V_{GS}=4.5V, I_D=6.8A$	15.3m Ω (typ.)	



G : Gate S : Source D : Drain

Outline

DFNWB2x2-6L-J



Ordering Information

Device	Package	Shipping
KWB010N02DFJ6	DFNWB2x2-6L-J (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}	25	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _A =25°C, V _{GS} =10V (Note 3)	I _{DSM}	8.8	A
Continuous Drain Current @ T _A =70°C, V _{GS} =10V (Note 3)		7.0	
Continuous Drain Current @ T _C =25°C, V _{GS} =10V	I _D	18.2	
Continuous Drain Current @ T _C =70°C, V _{GS} =10V		14.6	
Pulsed Drain Current (Note 1, 2)	I _{DM}	72	
Power Dissipation @ T _A =25°C (Note 3)	P _{DSM}	2.1	W
Power Dissipation @ T _A =70°C (Note 3)		1.3	
Power Dissipation @ T _C =25°C	P _D	8.9	
Power Dissipation @ T _C =70°C		5.7	
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	14	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	60 (Note 3)	

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle≤1%
3. Surface mounted on 1 in²copper pad of FR-4 board.

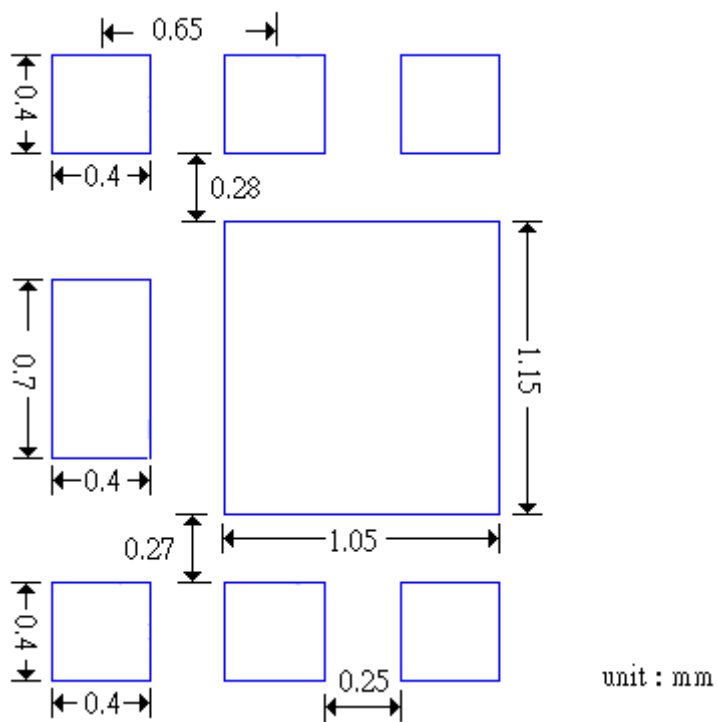
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	2.35	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =20V, V _{GS} =0V
	-	-	10	μA	V _{DS} =20V, V _{GS} =0V, T _j =55°C
*R _{DS(ON)}	-	10.9	14.2	mΩ	V _{GS} =10V, I _D =8.5A
	-	15.3	20		V _{GS} =4.5V, I _D =6.8A
*G _{FS}	-	7	-	S	V _{DS} =5V, I _D =8.5A
Dynamic					
C _{iss}	-	539	-	pF	V _{DS} =10V, V _{GS} =0, f=1MHz
C _{oss}	-	104	-		
C _{rss}	-	85	-		
t _{d(ON)}	-	10.2	-	ns	V _{DD} =13V, I _D =8.5A, V _{GS} =4.5V, R _G =1.8Ω
t _r	-	21	-		
t _{d(OFF)}	-	21.6	-		
t _f	-	11.2	-		

Qg(V _{GS} =10V)	-	13	-	nC	V _{DS} =13V, I _D =8.5A, V _{GS} =10V
Qg(V _{GS} =4.5V)	-	6.7	-		
Qgs	-	1.8	-		
Qgd	-	3.0	-		
Rg	-	4.7	-	Ω	f=1MHz
Source-Drain Diode					
*V _{SD}	-	0.87	1.0	V	V _{GS} =0V, I _S =8.5A
*t _{rr}	-	5.9	-	ns	I _F =8.5A, dI _F /dt=280A/μs
*Q _{rr}	-	3.9	-	nC	

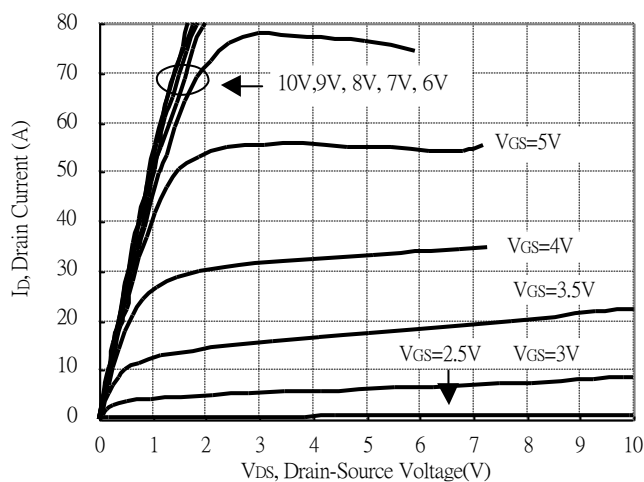
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

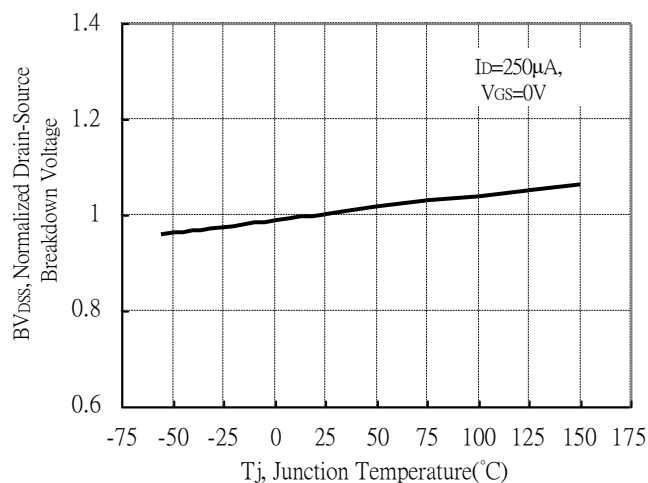


Typical Characteristics

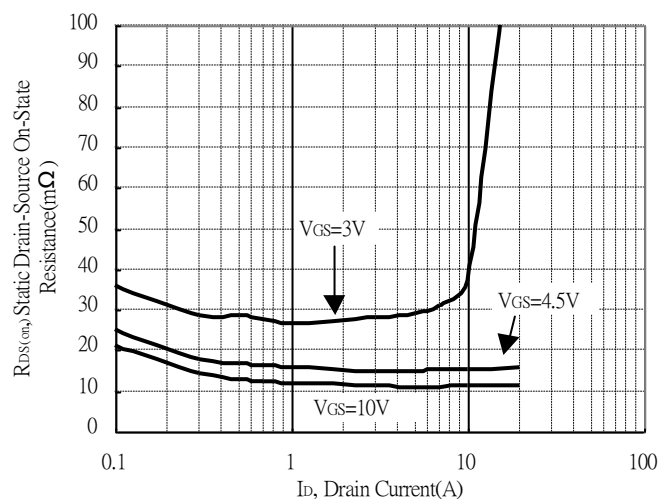
Typical Output Characteristics



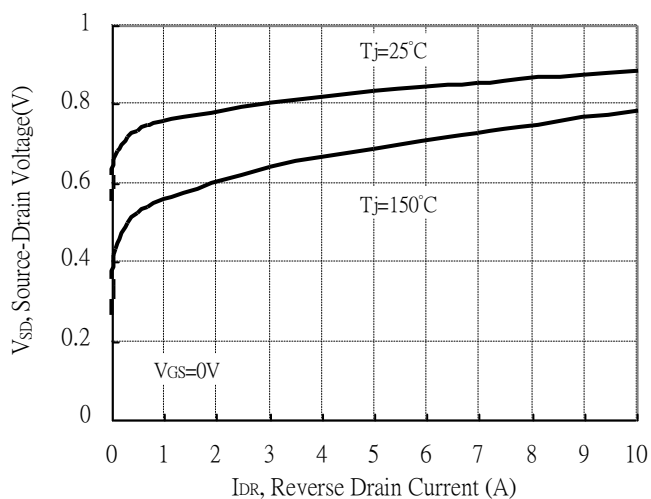
Breakdown Voltage vs Ambient Temperature



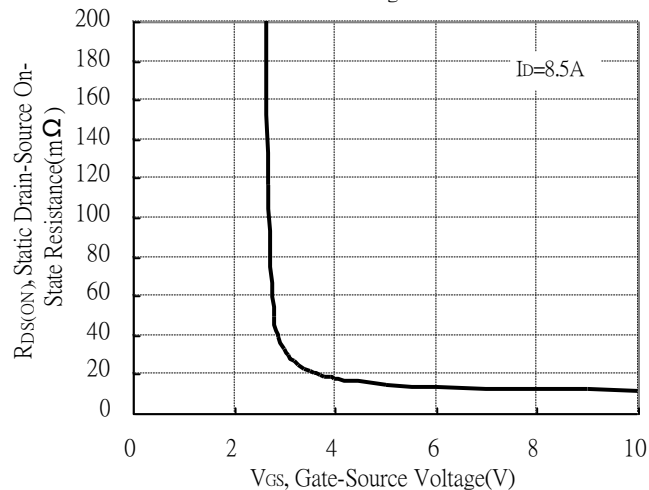
Static Drain-Source On-State resistance vs Drain Current



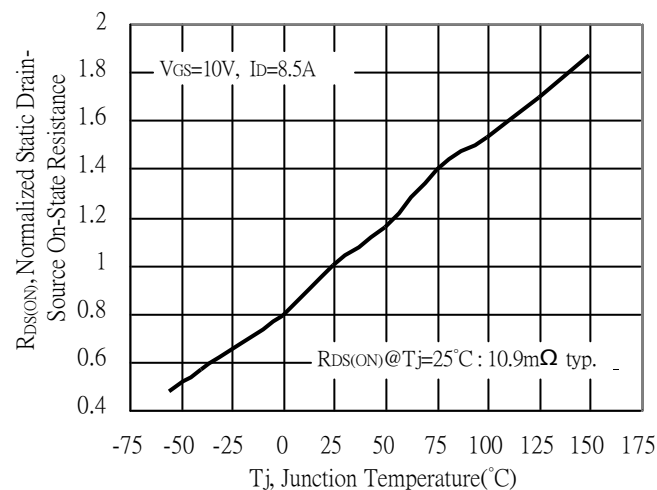
Reverse Drain Current vs Source-Drain Voltage



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

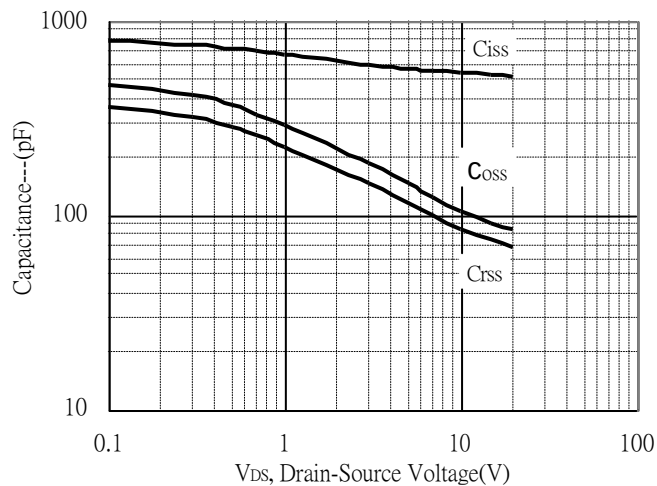


Drain-Source On-State Resistance vs Junction Temperature

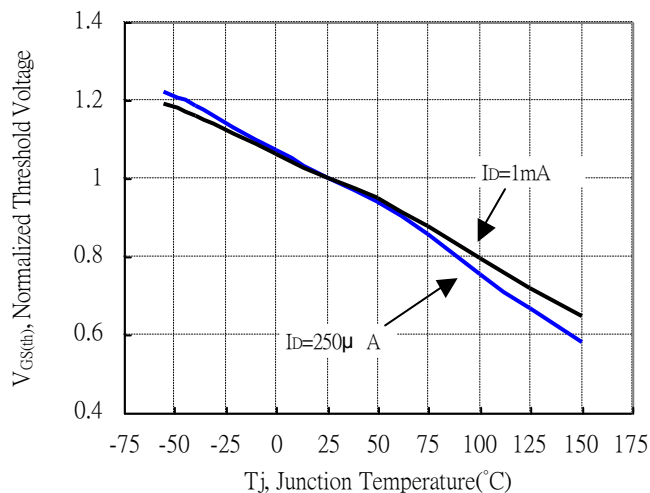


Typical Characteristics(Cont.)

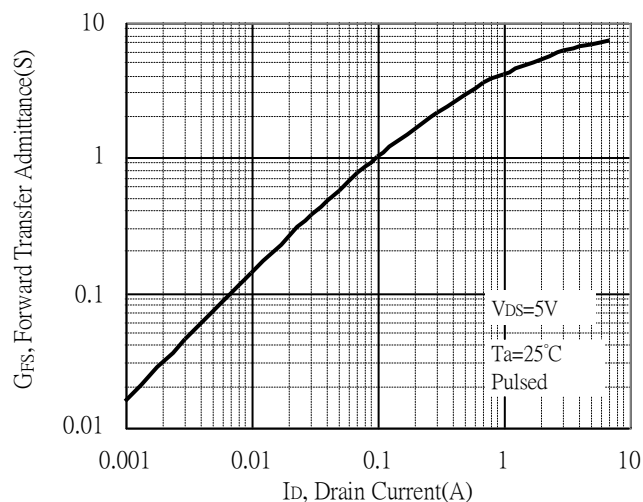
Capacitance vs Drain-to-Source Voltage



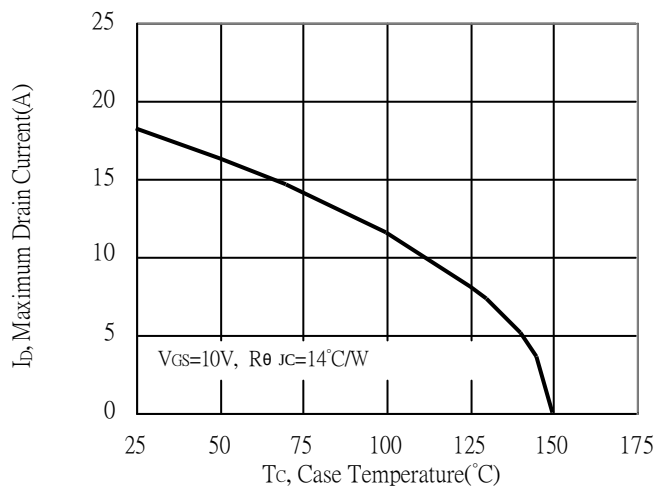
Threshold Voltage vs Junction Temperature



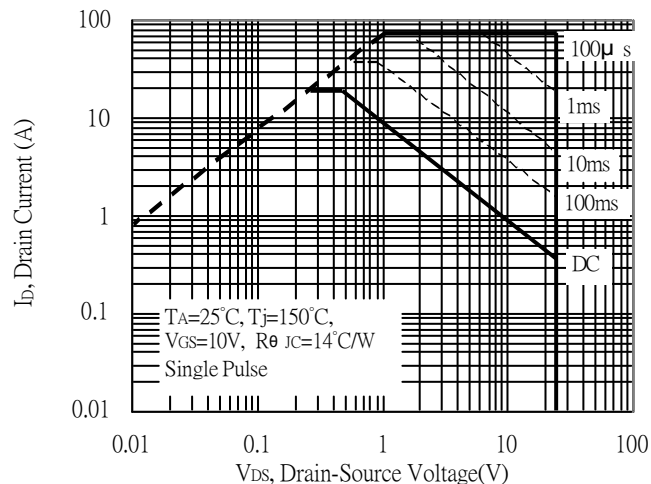
Forward Transfer Admittance vs Drain Current



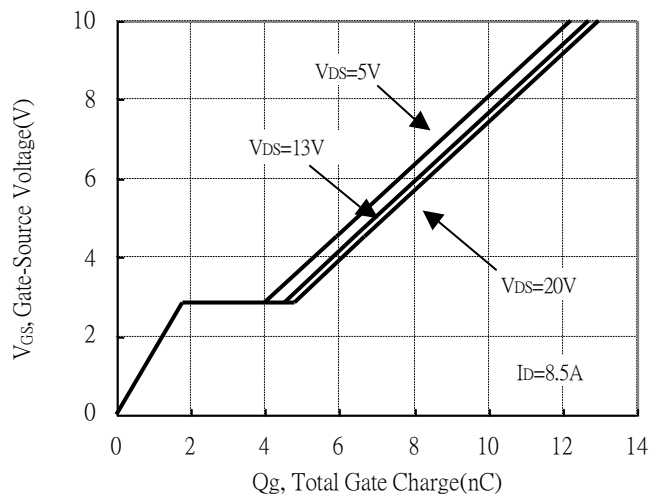
Maximum Drain Current vs Case Temperature



Maximum Safe Operating Area

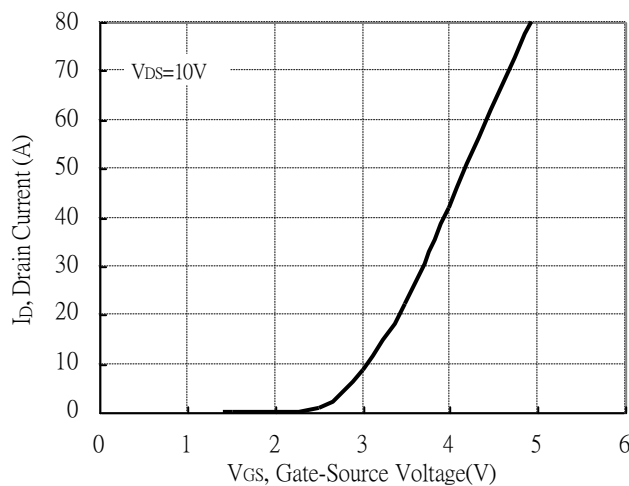


Gate Charge Characteristics

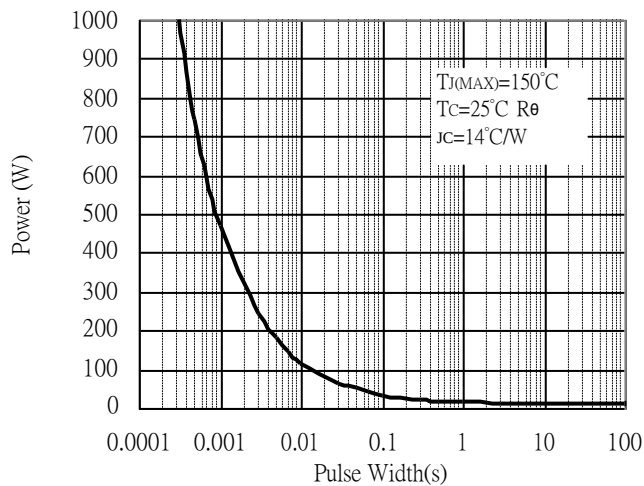


Typical Characteristics(Cont.)

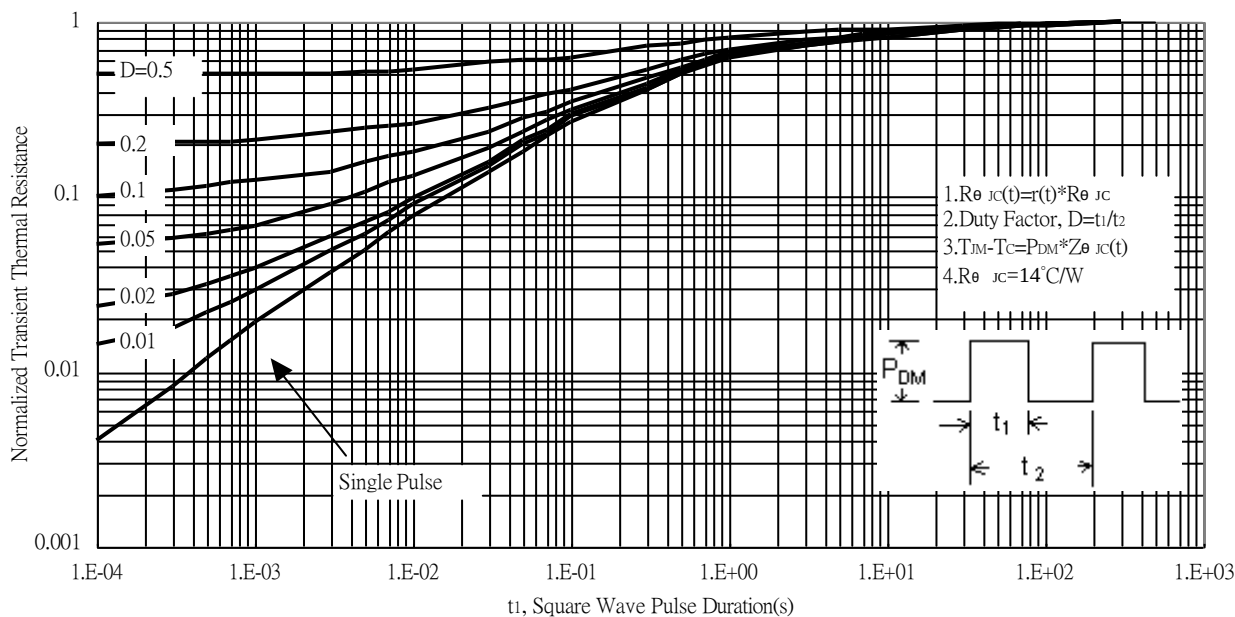
Typical Transfer Characteristics



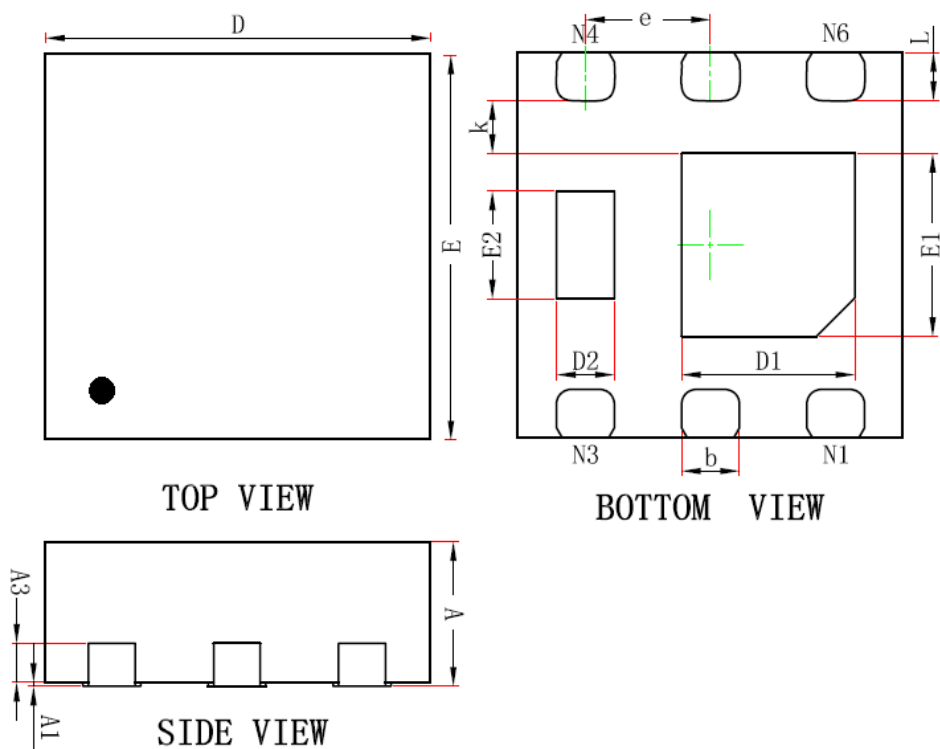
Single Pulse Power Rating, Junction to Case



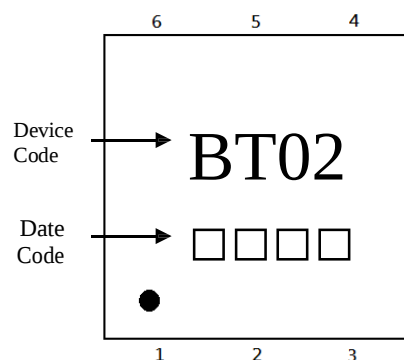
Transient Thermal Response Curves



DFNWB2×2-6L-J Dimension



Marking:



Style: Pin 1.Drain 2.Drain 3.Gate
 4.Source 5.Drain 6.Drain

6-Lead DFNWB2×2-6L-J
 Plastic Surface Mounted
 Package Code: DFJ6

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031	D2	0.200	0.400	0.008	0.016
A1	0.000	0.050	0.000	0.002	E2	0.460	0.660	0.018	0.026
A3	0.203	REF	0.008	REF	k	0.200	-	0.008	-
D	1.924	2.076	0.076	0.082	b	0.250	0.350	0.010	0.014
E	1.924	2.076	0.076	0.082	e	0.650	TYP	0.026	TYP
D1	0.800	1.000	0.031	0.039	L	0.174	0.326	0.007	0.013
E1	0.850	1.050	0.033	0.041					