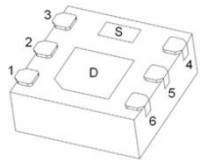
20V N-Channel Trench Power MOSFET

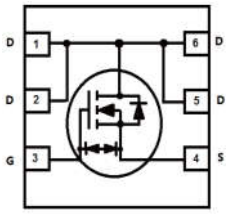
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	13mΩ@4.5V	8A
	18mΩ@2.5V	

DFNWB2×2-6L



Schematic diagram



Marking

3416K
YYWW

3416K : Device Code
YY : Year Code
WW : Week Code

Features

- Very Low On-resistance $R_{DS(ON)}$
- LowCrss
- Fast switching
- Improved dv/dt capability

Applications

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Units
Drain - Source Voltage		V_{DS}	20	V
Gate - Source Voltage		V_{GS}	±10	V
Continuous Drain Current [1,5]	TA = 25℃	I_D	8	A
Pulsed Drain Current [2]		I_{DM}	26	A
Power Dissipation [4,5]		P_D	1.5	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	83	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

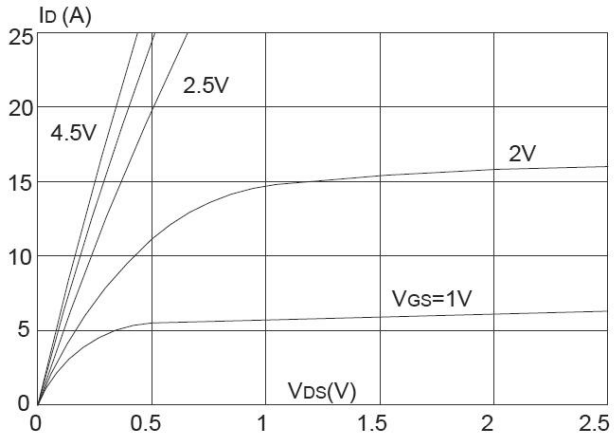
Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D= 250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 20V, V_{GS}= 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}= 0V			±10	μA
Gate Threshold Voltage [3]	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	0.4	0.7	1	V
Drain-source On-resistance [3]	$R_{DS(on)}$	V_{GS}= 4.5V, I_D= 5A		13	20	mΩ
		V_{GS}= 2.5V, I_D= 3A		18	30	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}= 10V, V_{GS}= 0V, f= 1.0MHz		545		pF
Output Capacitance	C_{oss}			103		
Reverse Transfer Capacitance	C_{rss}			90		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}= 10V, I_D= 5A, V_{GS}= 4.5V		8		nC
Gate-source Charge	Q_{gs}			2.5		
Gate-drain Charge	Q_{gd}			3		
Turn-on Delay Time	$t_{d(on)}$	V_{DS}= 10V, R_L= 1.5Ω, R_{GEN}= 3Ω, V_{GS}= 5V		0.5		ns
Turn-on Rise Time	t_r			1		
Turn-off Delay Time	$t_{d(off)}$			12		
Turn-off Fall Time	t_f			4		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}= 0V, I_S= 5A			1.2	V

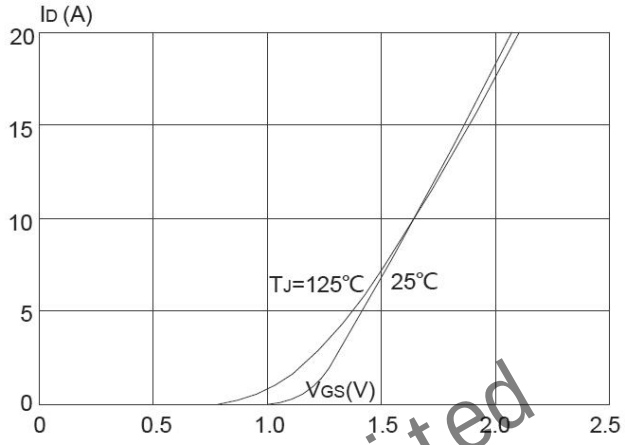
Notes :

1. The maximum current rating is limited by package.
2. Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
3. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
4. The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.
5. Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

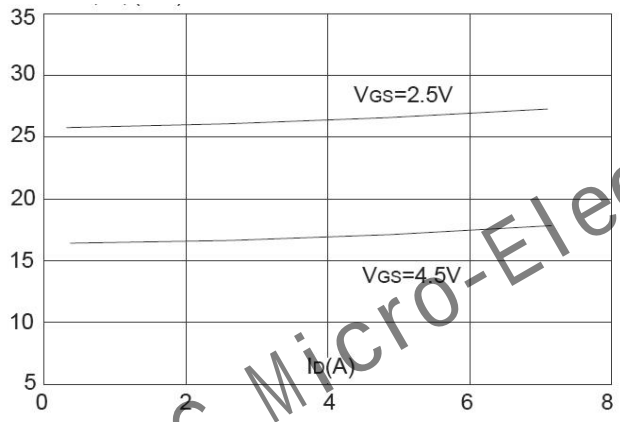
Typical Characteristic



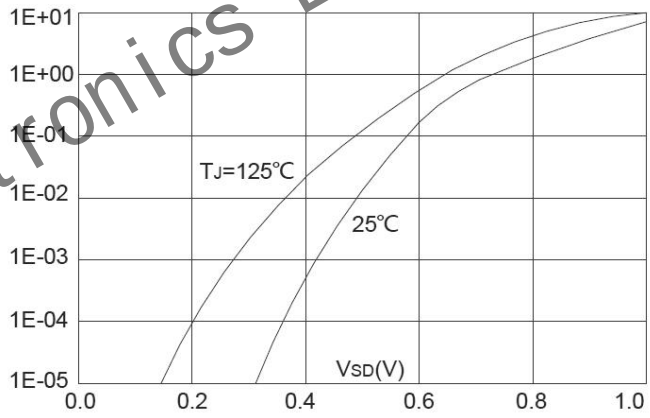
Output Characteristics



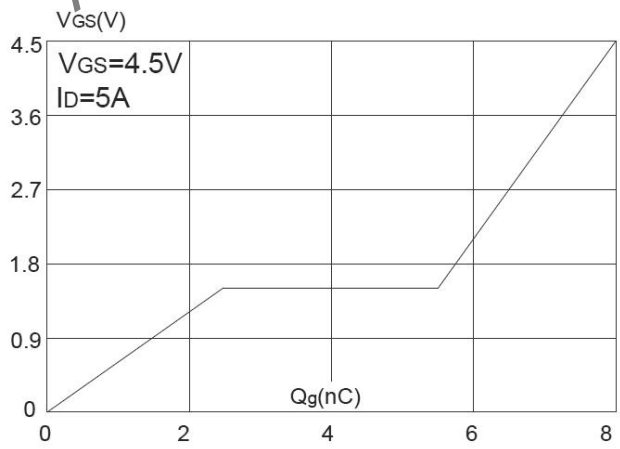
Transfer Characteristics



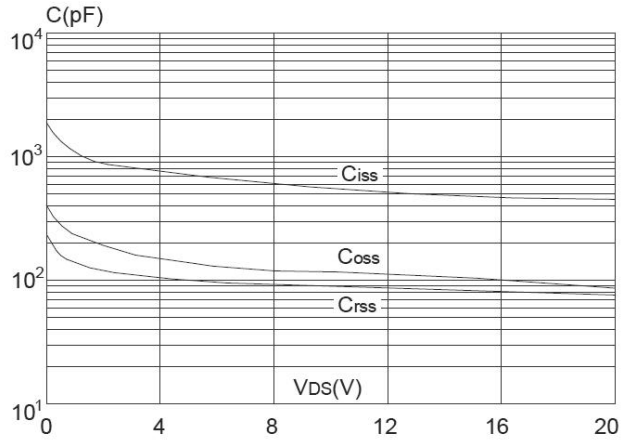
$R_{DS(ON)}$——I_D



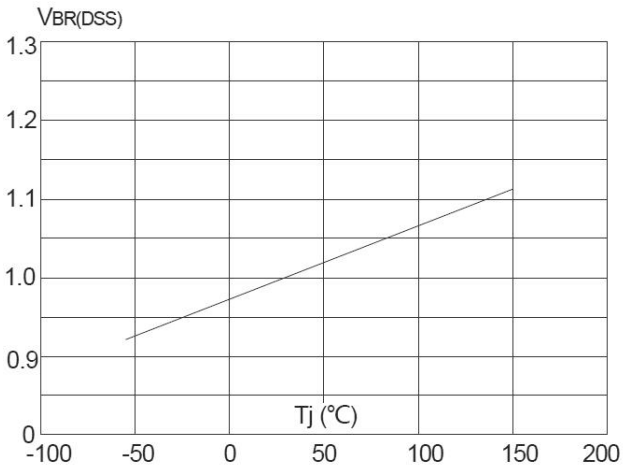
Body Diode Characteristics



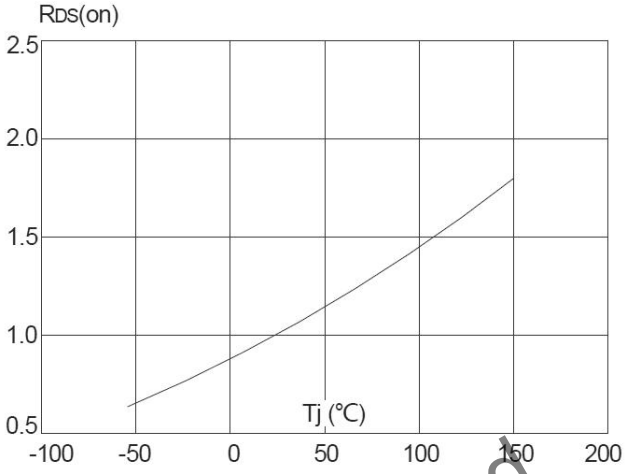
Gate Charge Characteristics



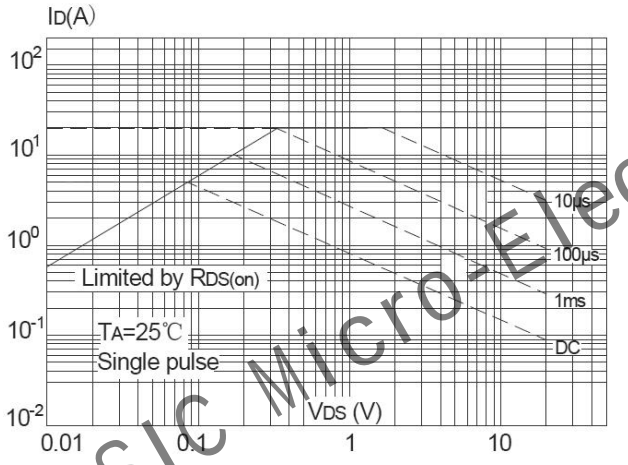
Capacitance Characteristics



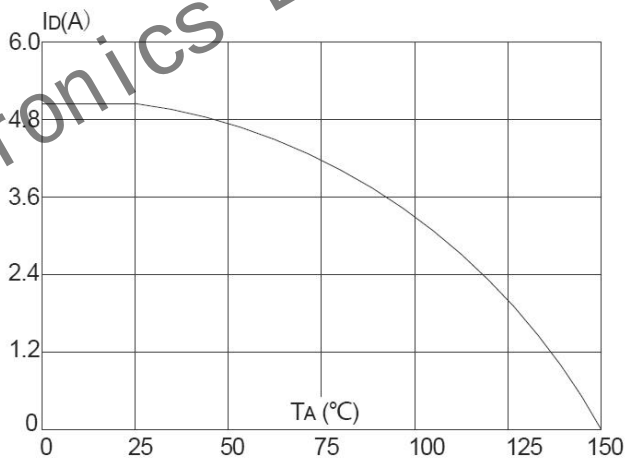
Normalized Breakdown Voltage vs. Junction Temperature



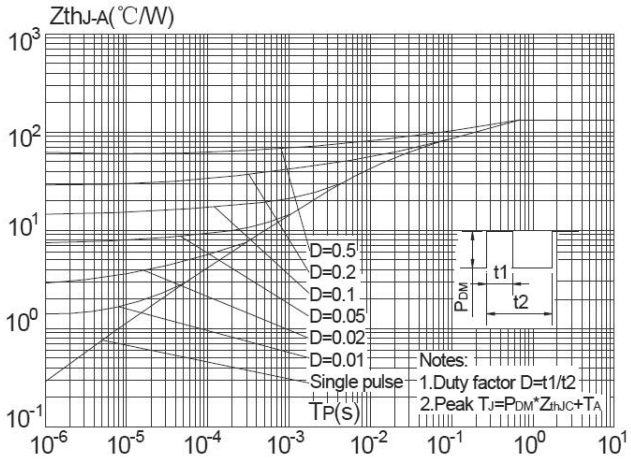
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area



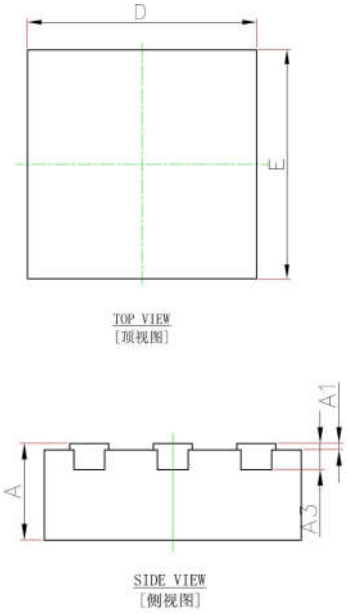
Maximum Continuous Drain Current vs. Ambient Temperature

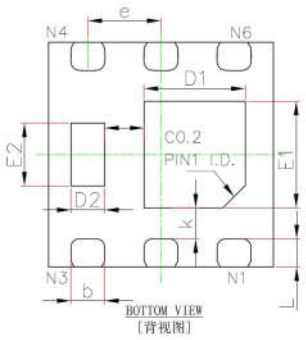


Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Dimension

DFNWB2×2-6L





Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
b	0.250	0.350	0.010	0.014
e	0.650BSC.		0.026BSC.	
k	0.275REF.		0.011REF.	
k1	0.350REF.		0.014REF.	
L	0.174	0.326	0.007	0.013