Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-16V	13mΩ@-4.5V	-20A
	16mΩ@-2.5V	

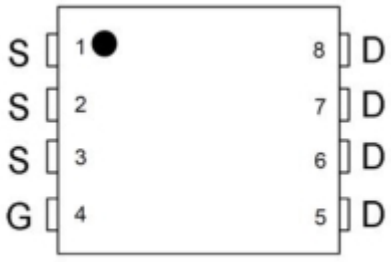
Feature

- Advanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge

Applications

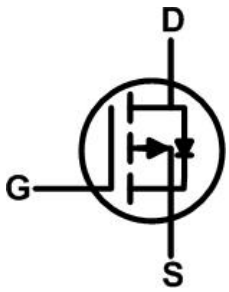
- PWM application
- Load switch
- Battery charge in cellular handset

Package



PDFNWB3.3×3.3-8L

Circuit diagram



Marking

Q1613 =Device Code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	-16	V
Gate-source Voltage	V_{GS}	±12	V
Drain Current	I_D	-20	A
Pulsed Drain Current [1]	I_{DM}	-80	A
Total Power Dissipation @ T_C=25℃	P_D	23	W
Thermal Resistance Junction-to-Case @ Steady State	$R_{\theta JC}$	5.4	℃/ W
Junction and Storage Temperature Range	$T_{STG,}$ T_J	-55 ~ +150	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-16			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-16V, V_{GS} = 0V, T_C=25℃			-1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±10V, V_{DS} = 0V			±100	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-10A		13	18	mΩ
		V_{GS} =-2.5V, I_D =-6.5A		16	22	
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz		2050		pF
Output capacitance	C_{oss}			411		
Reverse transfer capacitance	C_{rss}			362		
Switching Characteristics						
Total gate charge	Q_g	V_{GS}=-10V , V_{DS}=-16V , I_D=-9.1A		30		nC
Gate-source charge	Q_{gs}			5.3		
Gate-drain charge	Q_{gd}			7.6		
Turn-on Delay Time	$T_{d(on)}$	V_{GS}=-10V, V_{DS}=-16V, I_D =-6A, R_G =2.5Ω		14		nS
Turn-on Rise Time	T_r			20		
Turn-Off Delay Time	$T_{d(off)}$			95		
Turn-Off Fall Time	t_f			65		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS} = 0V		-0.8	-1.2	V

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics

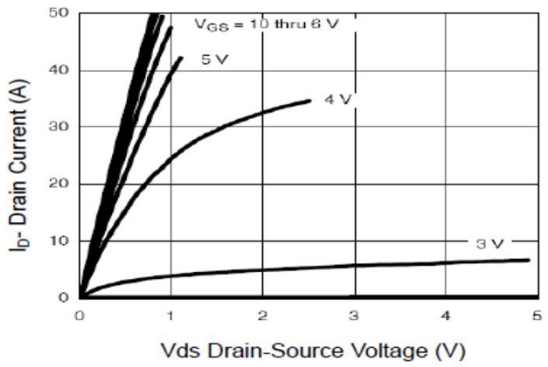


Figure1. Output Characteristics

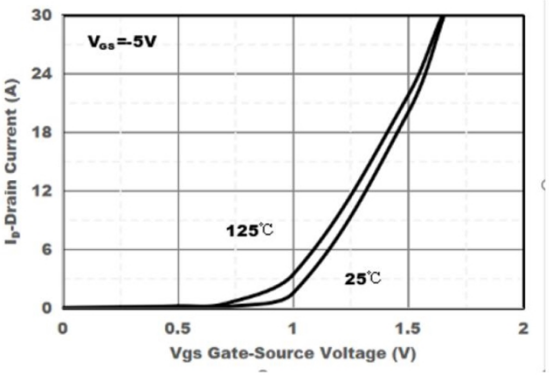


Figure2. Transfer Characteristics

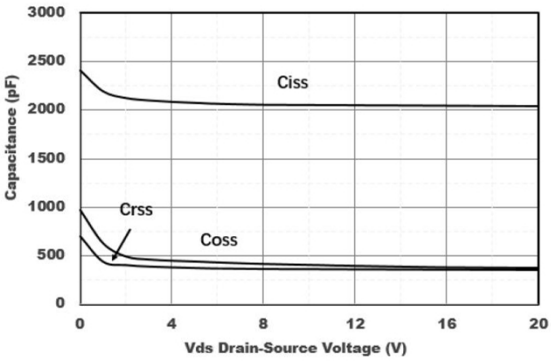


Figure3. Capacitance Characteristics

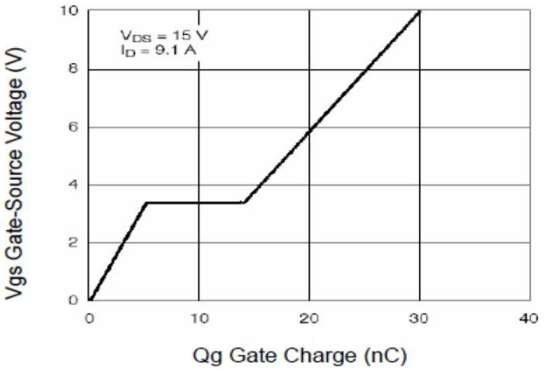


Figure4. Gate Charge

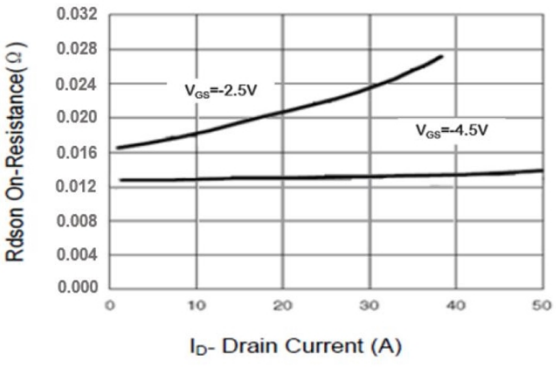


Figure5. Drain-Source on Resistance

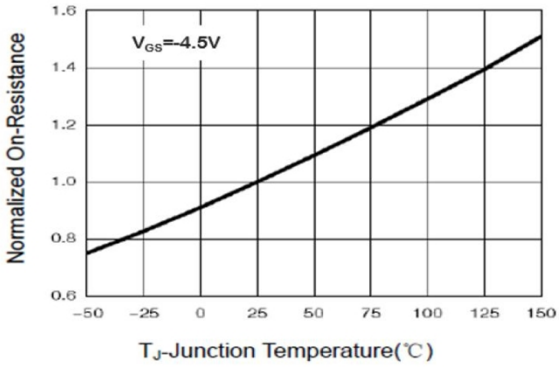


Figure6. Drain-Source on Resistance

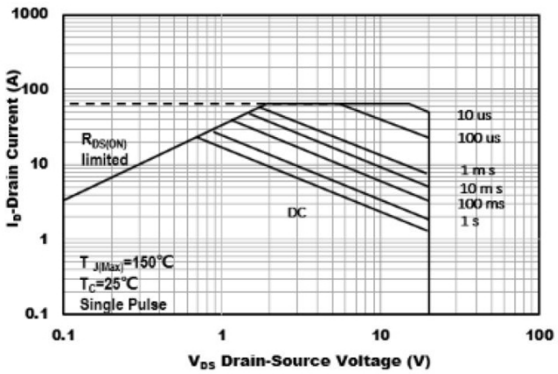


Figure7. Safe Operation Area

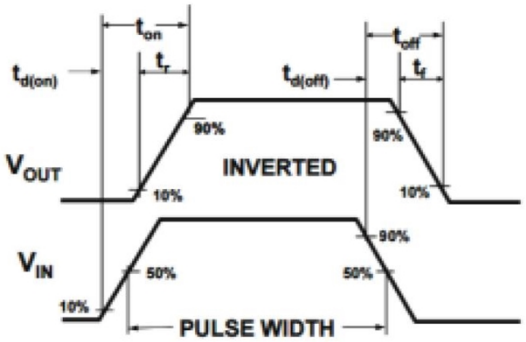
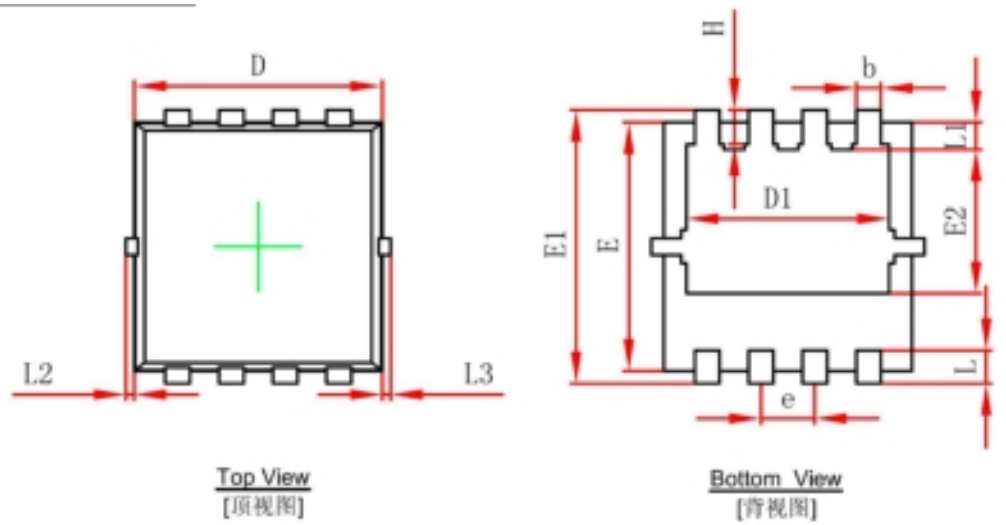
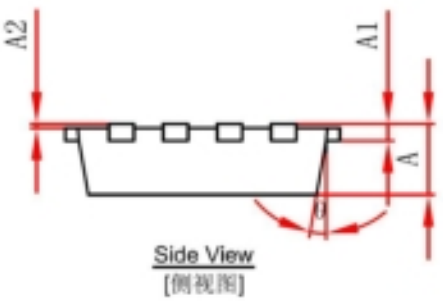


Figure8. Switching wave

PDFNWB3.3×3.3-8L Package Information





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°