## Dual N-Channel Enhancement Mode Power MOSFET

Description

The MXN2508 uses advanced trench technology to provideexcellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as aload switch or in PWM applications.it is ESD protected.
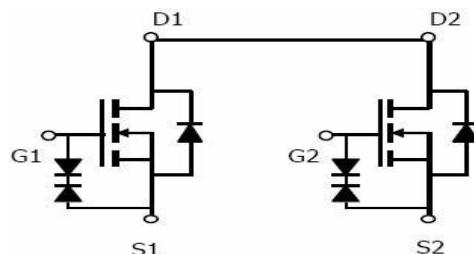
General Features

◆ V_{DS} =20V，I_D =8A
   @V_{GS}=4.5V $R_{DS(ON)}$(Typ.)=14mΩ
   @V_{GS}=4.2V $R_{DS(ON)}$(Typ.)=14.4mΩ
   @V_{GS}=3.8V $R_{DS(ON)}$(Typ.)=15.6mΩ
   @V_{GS}=2.5V $R_{DS(ON)}$(Typ.)=19mΩ
   ESD Rating: 2000V HBM

◆ Asvanced trench MOSFET process technology
◆ Ultra low on-resistance with low gate charge
◆ New Thermally Enhanced DFN2X5-6L Package
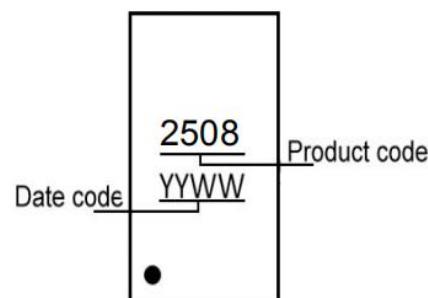
Application

◆ PWM applications
◆ Load switch
◆ battery charge in cellular handset

Schematic diagram

Marking Description
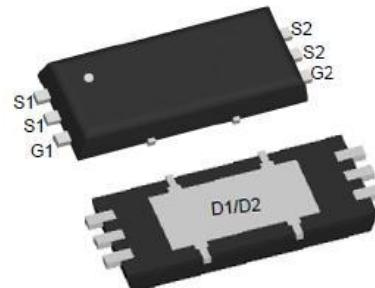
DFN2x5-6L Pin definition and Top / Bottom View

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	8	A
Drain Current-Pulsed (Note 1)	I_{DM}	32	A
Maximum Power Dissipation	P_D	1.7	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Electrical Characteristics (TA=25℃   unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.45	0.7	0.95	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=6.5A	12	14	16	mΩ
		V_{GS}=-4.2V, I_D=6.5A	12.5	14.4	17	mΩ
		V_{GS}=3.8V, I_D=5.5A	13	15.6	18	mΩ
		V_{GS}=2.5V, I_D=5.5A	17	19	22	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=7A	-	20	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=10V, V_{GS}=0V F=1.0MHz	-	1150	-	PF
Output Capacitance	C_{oss}		-	185	-	PF
Reverse Transfer Capacitance	C_{rss}		-	145	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, R_L=1.35Ω V_{GS}=5V, R_{GEN}=3Ω	-	6	-	nS
Turn-on Rise Time	t_r		-	13	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	nS
Turn-Off Fall Time	t_f		-	16	-	nS
Total Gate Charge	Q_g	V_{DS}=10V, I_D=7A, V_{GS}=4.5V	-	15	-	nC
Gate-Source Charge	Q_{gs}		-	0.8	-	nC
Gate-Drain Charge	Q_{gd}		-	3.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V, I_S=1A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	7	A

Notes:

a. surface mounted on FR4 board, t≤10sec
b. pulse test: pulse width≤300μs, duty≤2%
c. guaranteed by design, not subject to production testing

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
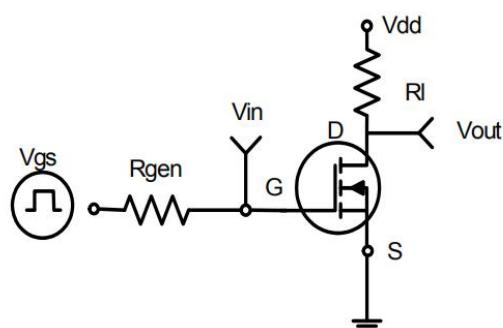
Figure 1:Switching Test Circuit
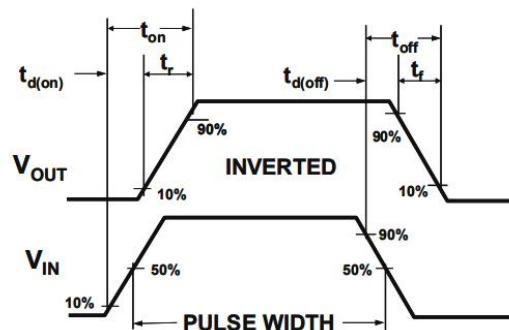
Figure 2:Switching Waveforms
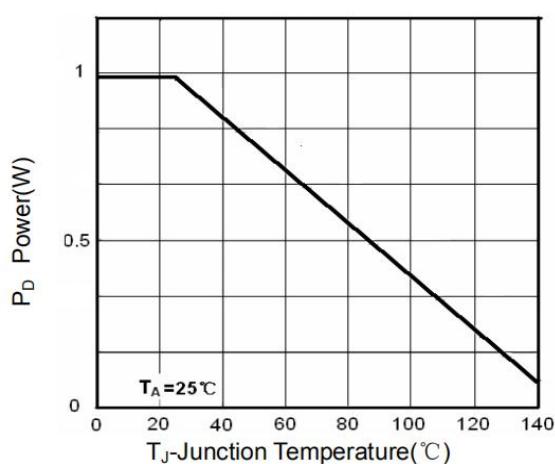
Figure 3 Power Dissipation
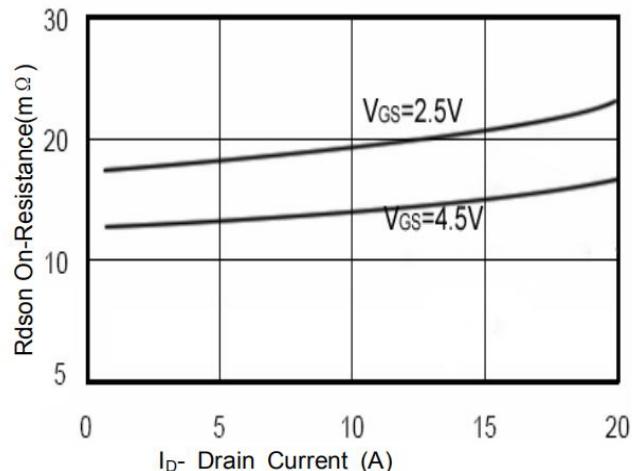
Figure 4 Drain-Source On-Resistance
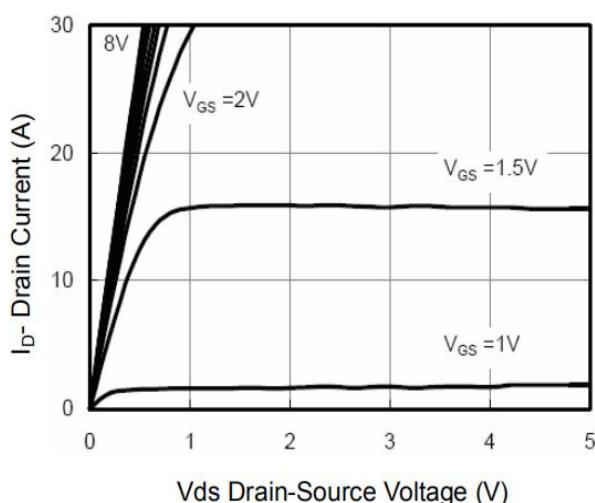
Figure 5 Output CHARACTERISTICS
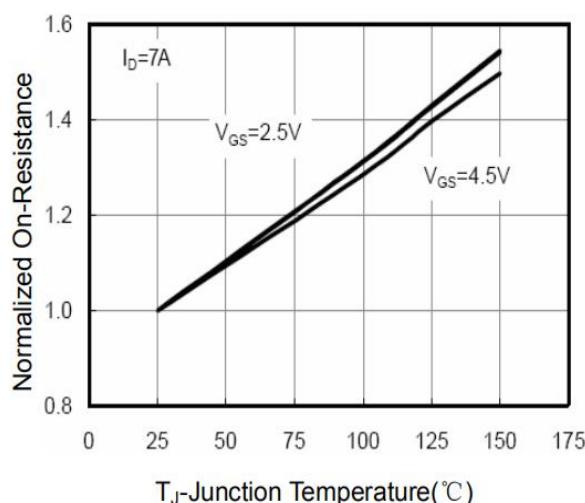

**Figure 6 Drain-Source On-Resistance**
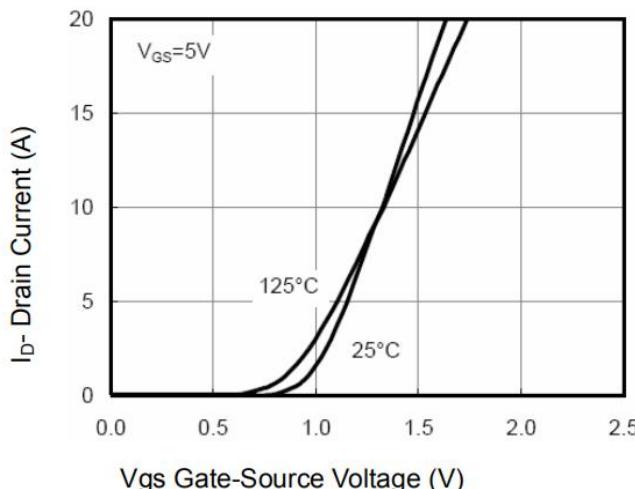
Figure 7 Transfer Characteristics
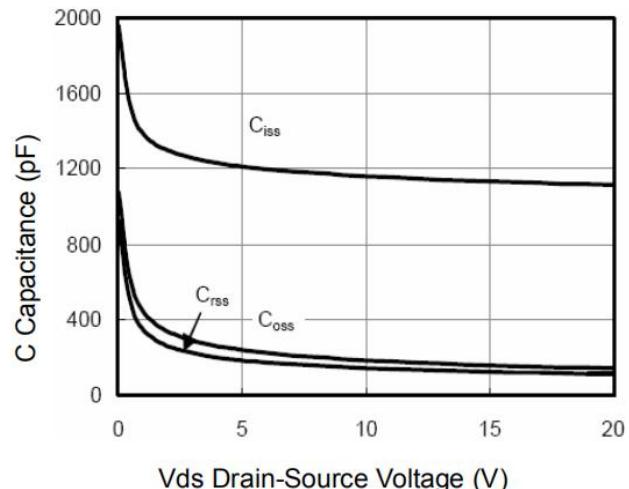
Figure 8 Capacitance vs Vds
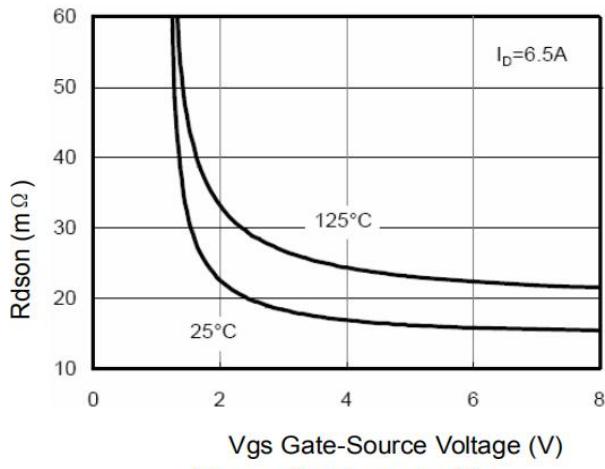
Figure 9 Rdson vs Vgs
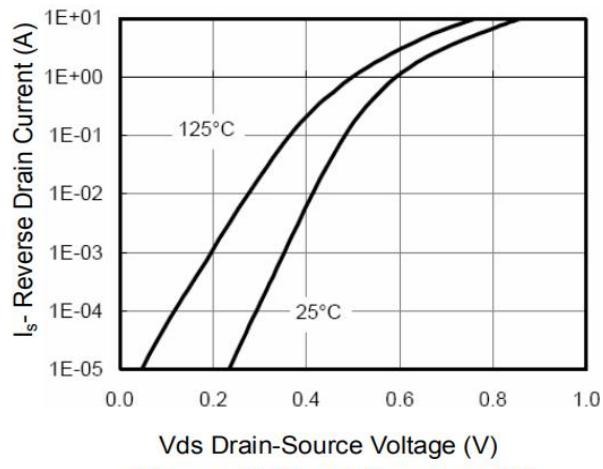
Figure 10 Capacitance vs Vds
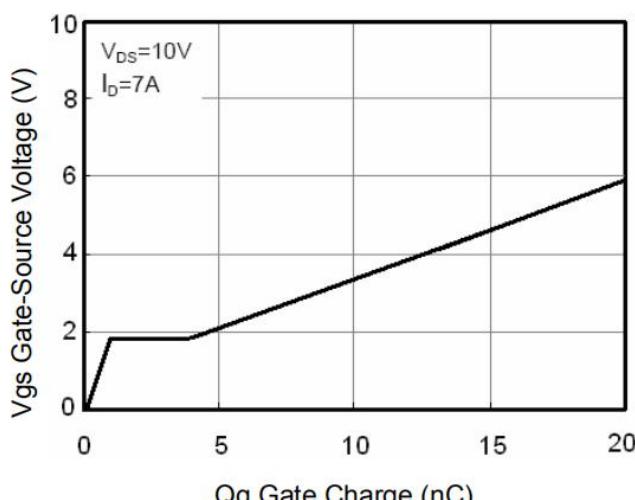
**Figure 11 Gate Charge**
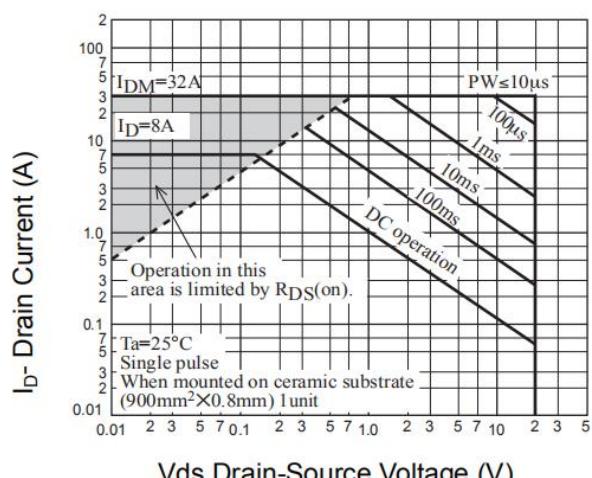
Figure 12 Safe Operation Area
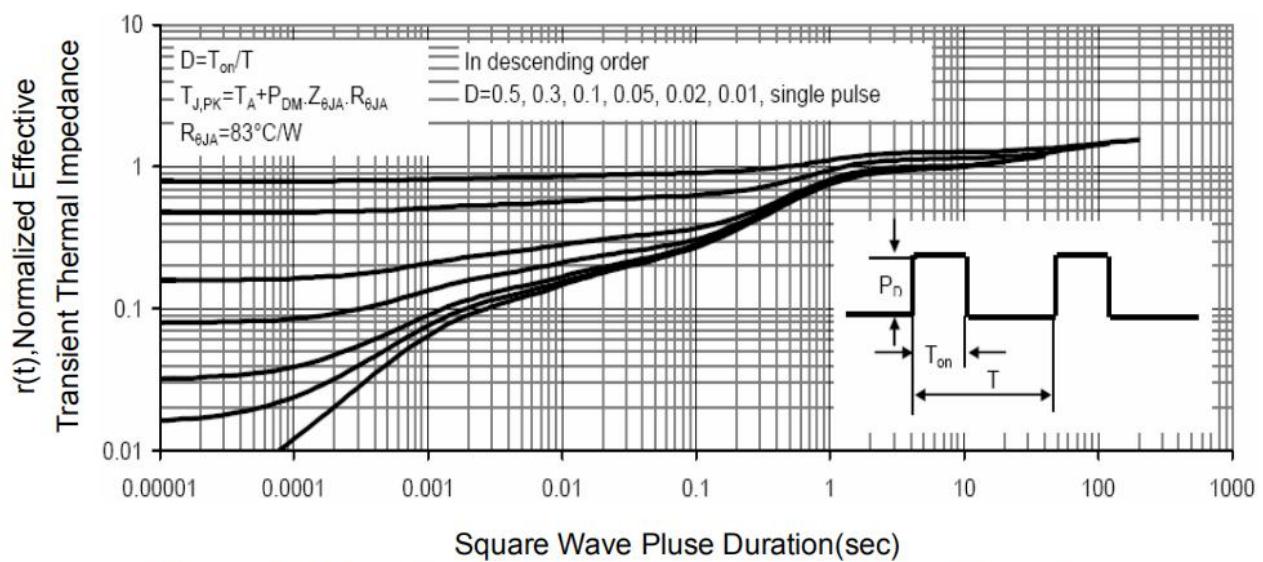
Figure 13 Normalized Maximum Transient Thermal Impedance

DFN2X5-6L PACKAGE OUTLINE DIMENSIONS

DFNWB2×5-6L(P0.50TO.75/0.85) PACKAGEOUTLINEDIMENSIONS

TOPVIEW   BOTTOMVIEW   SIDEVIEW
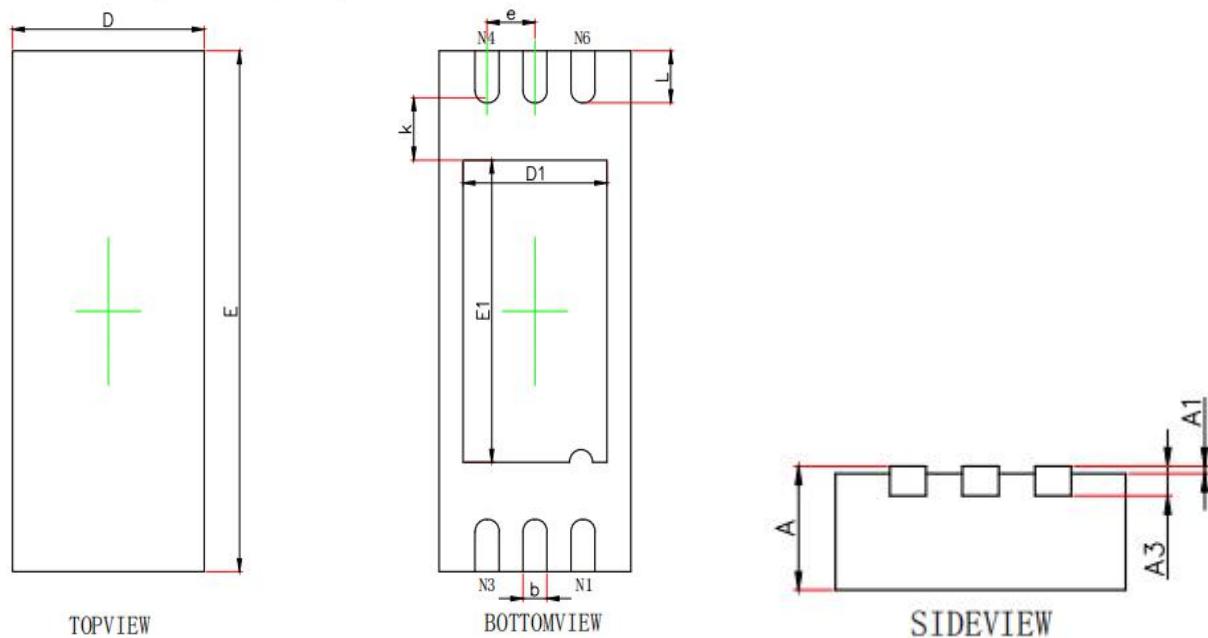
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	4.924	5.076	0.194	0.200
D1	1.400	1.600	0.055	0.063
E1	2.800	3.000	0.110	0.118
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.374	0.526	0.015	0.021