

DESCRIPTION

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

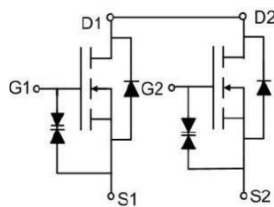
GENERAL FEATURES

- $V_{DS}=20V$, $I_D=11A$,
 $R_{DS(ON)}=8.8m\Omega$ @ $V_{GS}=2.5V$
 $R_{DS(ON)}=6.5m\Omega$ @ $V_{GS}=4.5V$
- Fast switching
- G-S ESD protection diode embedded
- Green Device Available

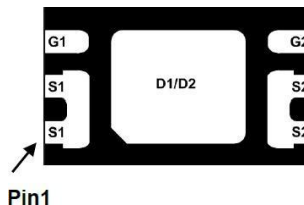
APPLICATION

- MB / VGA / Vcore
- Portable Equipment
- Battery Powered System
- Load Switch
- LCD Display inverter

PINOUT



Schematic diagram



Pin1

DFN2X3 bottom view & Pin Description

ORDERING INFORMATION

Device	Marking	Storage Temperature	Package	Devices Per Reel
MXN8233	8233	-55°C to 150°C	DFN2X3	3000

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ^(Note1)	I_D	11	A
Continuous Drain Current ($T_A=70^\circ C$) ^(Note1)	I_D	8.8	A
Pulse Drain Current ^(Note2)	I_{DM}	70	A
Maximum Power Dissipation ^(Note1)	P_D	1.56	W
Maximum Power Dissipation ($T_A=70^\circ C$) ^(Note1)	P_D	1	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

THERMAL RESISTANCE

Parameter	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	$^\circ C/W$

Note 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t \leq 10s$.

Note 2. The data tested by pulsed, pulse width $\leq 10\mu s$, duty cycle $\leq 1\%$



ELECTRICAL CHARACTERISTICS($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	-	1.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=18V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=18V, V_{GS}=0V, T_J=55^{\circ}\text{C}$	-	-	5	
Drain-Source On-State Resistance ^(Note1)	$R_{DS(ON)}$	$V_{GS}=2.5V, I_D=5.5A$	6	8.8	10.2	m Ω
		$V_{GS}=3.1V, I_D=5.5A$	5.3	7.5	9	
		$V_{GS}=3.7V, I_D=5.5A$	5	7	8.2	
		$V_{GS}=4.0V, I_D=5.5A$	4.8	6.8	7.5	
		$V_{GS}=4.5V, I_D=5.5A$	4.5	6.5	7.2	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5.5A$	-	36	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1.0\text{MHz}$	-	1767	-	pF
Output Capacitance	C_{oss}		-	164	-	
Reverse Transfer Capacitance	C_{rss}		-	155	-	
Total Gate Charge	Q_g	$V_{DS}=16V, I_D=10A, V_{GS}=4.5V$	-	23	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	
Gate-Drain Charge	Q_{gd}		-	8.4	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=16V, I_D=5.5A, V_{GS}=4.5V, R_G=6\Omega$	-	10.2	-	nS
Turn-On Rise Time	t_r		-	41	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	67	-	nS
Turn-Off Fall Time	t_f		-	31	-	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^(Note2)	V_{SD}	$I_S=11A, V_{GS}=0V$	-	-	1.2	V
Diode Continuous Current ^(Note1)	I_{SD}		-	-	11	A

Note 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t \leq 10s$.

Note 2. The data tested by pulsed , pulse width $\leq 10\mu s$, duty cycle $\leq 1\%$

TYPICAL PERFORMANCE CHARACTERISTICS

Figure 1. Typical Output Characteristics

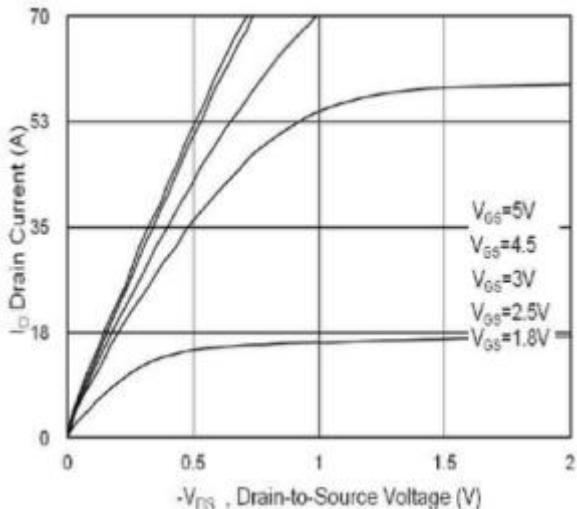


Figure 2. On-Resistance vs. Gate-Source

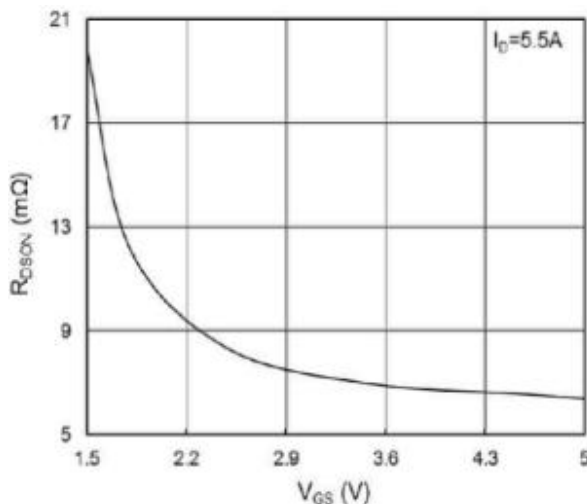


Figure 3. Forward Characteristics of Reverse

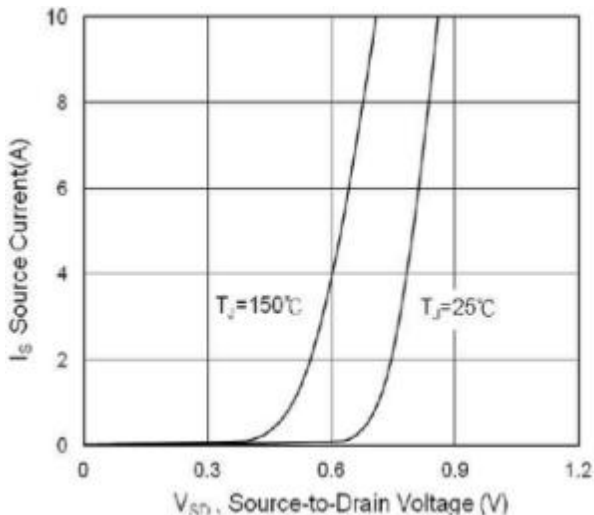


Figure 4. Gate Charge Characteristics

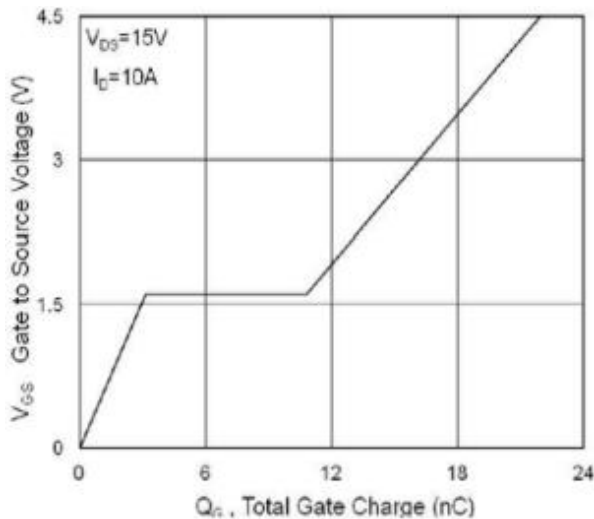


Figure 5. $V_{GS(th)}$ vs. T_J

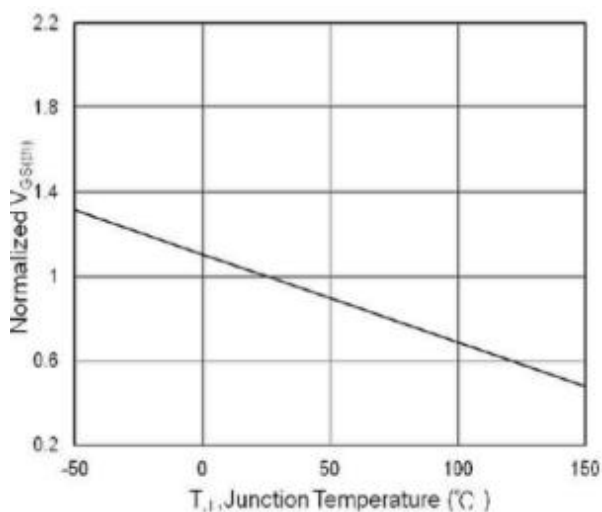
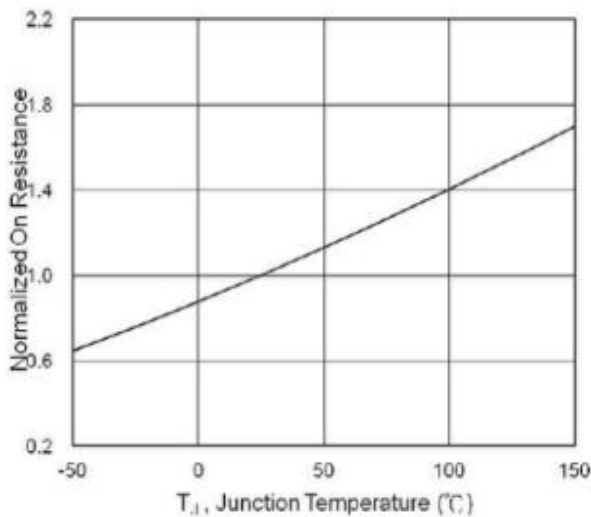


Figure 6. Normalized $R_{DS(on)}$ vs. T_J



TYPICAL PERFORMANCE CHARACTERISTICS

Figure 7. Capacitance

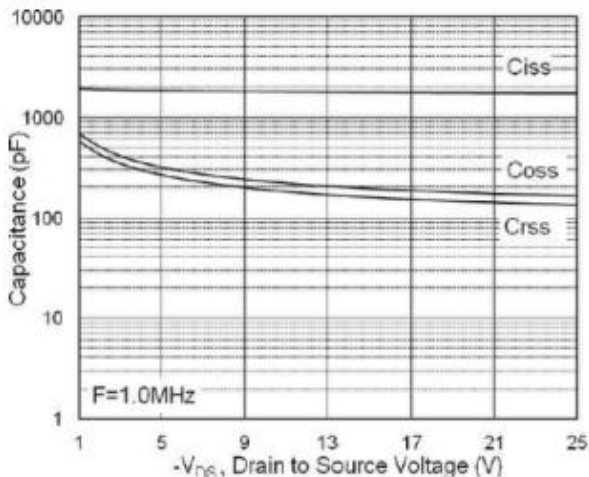


Figure 8. Safe Operating Area

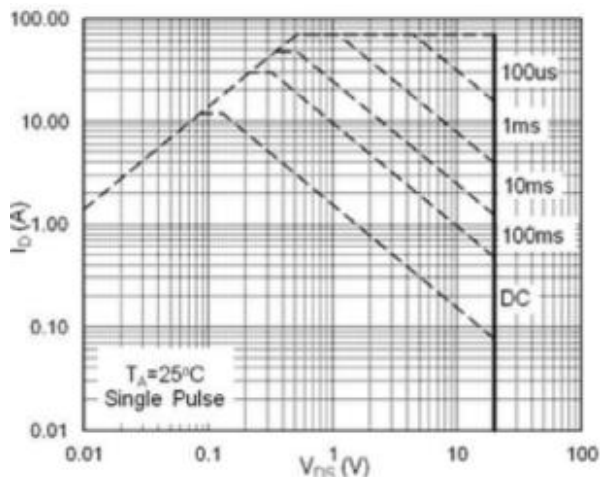


Figure 9. Normalized Maximum Transient Thermal Impedance

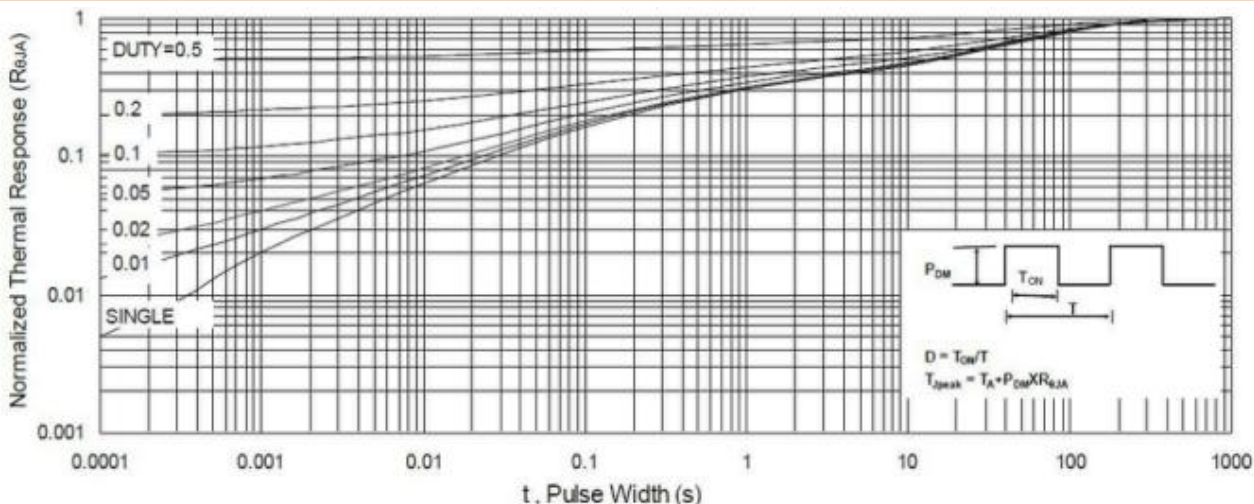


Figure 10. Switching Time Waveform

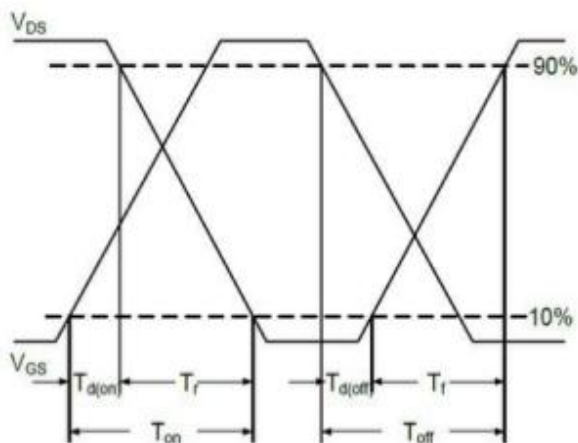
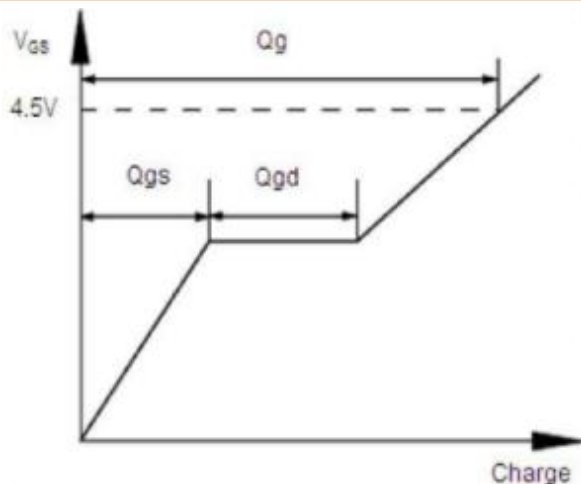
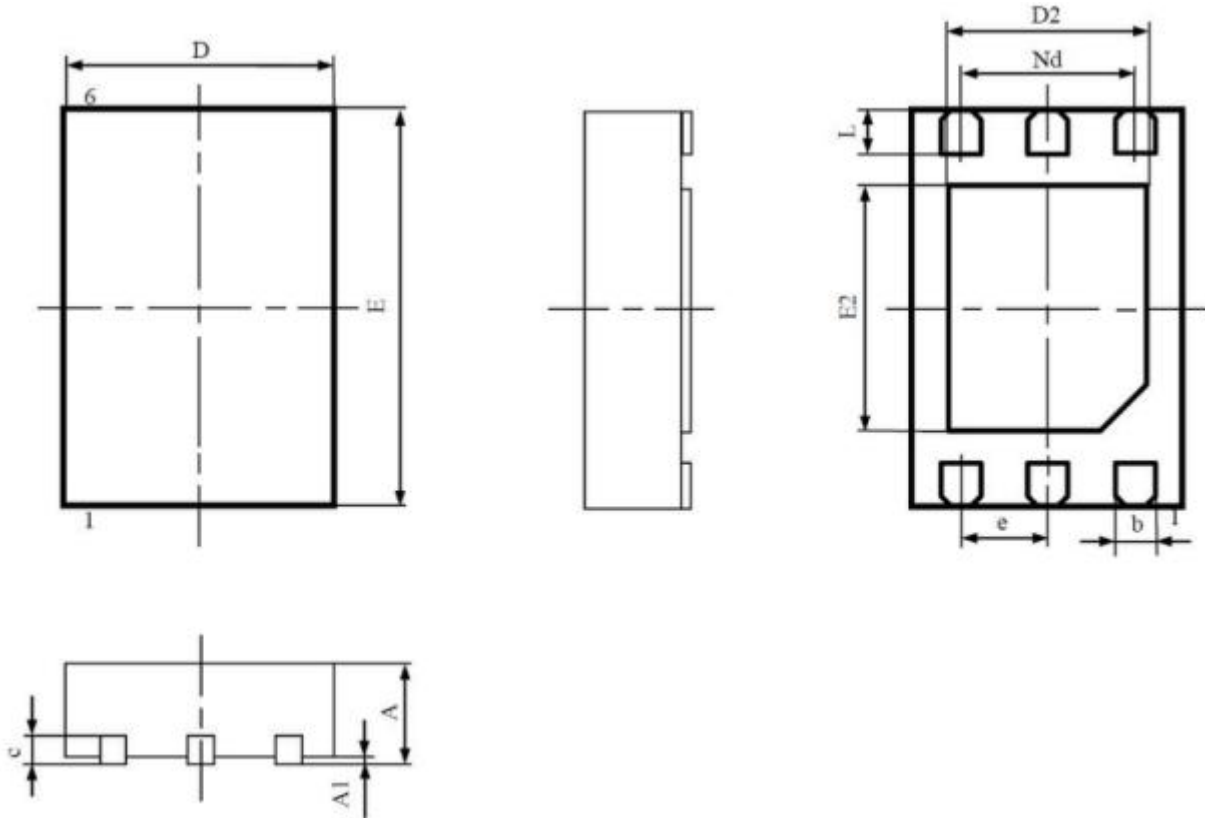


Figure 11. Gate Charge Waveform



PACKAGE INFORMATION

DFN-2X3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.550	0.800	0.028	0.031
A1	0.02typ.	0.050	0.001typ.	0.002
b	0.200	0.350	0.008	0.014
c	0.180	0.250	0.007	0.010
D	1.900	2.100	0.075	0.083
D2	1.400	1.600	0.055	0.063
e	0.5BSC		0.02BSC	
Nd	1.0BSC		0.04BSC	
E	2.900	3.100	0.114	0.122
E2	1.650	1.750	0.065	0.069
L	0.300	0.400	0.012	0.016