



DESCRIPTION

The MXD3016M uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.



GENERAL FEATURES

- $V_{DS}=30V$, $I_D=45A$
 $R_{DS(ON)}(Typ.)=4.7m\Omega$ @ $V_{GS}=10V$
 $R_{DS(ON)}(Typ.)=6.5m\Omega$ @ $V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

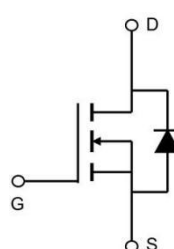


APPLICATION

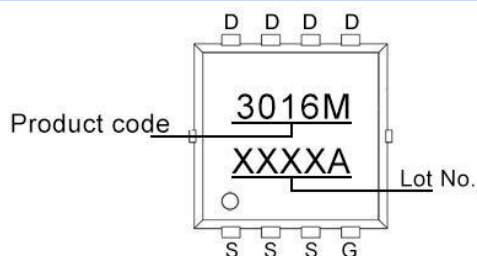
- PWM applications
- DC/DC Converters
- UPS



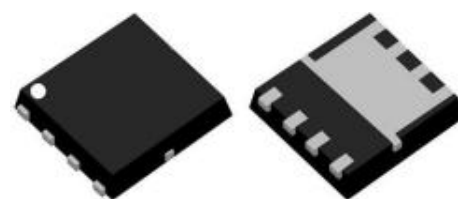
PINOUT



Schematic diagram



Marking and pin Assignment



PDFN3.3X3.3-8L top & bottom view



ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MXN3016M	-55°C to 150°C	PDFN3.3X3.3-8L	-



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	45	A
Pulsed Drain Current ^(Note1)	I_{DM}	110	A
Maximum Power Dissipation	P_D	29.8	W
Avalanche Current	I_{AS}	26	A
Avalanche Energy(L=0.5mH)	E_{AS}	169	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C



THERMAL RESISTANCE

Thermal Resistance, Junction-to-Case ^(Note2)	$R_{\theta JC}$	4.2	°C/W
---	-----------------	-----	------

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

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.


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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.65	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A	-	4.7	6.5	mΩ
		V _{GS} =4.5V, I _D =12A	-	6.5	10	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =11A	-	24	-	S
Dynamic Characteristics ^(Note3)						
Input Capacitance	C _{iSS}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	2000	-	pF
Output Capacitance	C _{oss}		-	235	-	pF
Reverse Transfer Capacitance	C _{rSS}		-	175	-	pF
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DS} =15V, R _L =0.75Ω, V _{GS} =10V, R _G =3Ω	-	8.8	-	nS
Turn-on Rise Time	t _r		-	12.2	-	nS
Turn-Off Delay Time	t _{d(off)}		-	29.5	-	nS
Turn-Off Fall Time	t _f		-	8.6	-	nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =20A, V _{GS} =10V	-	20.7	-	nC
Gate-Source Charge	Q _{gs}		-	3.5	-	nC
Gate-Drain Charge	Q _{gd}		-	5.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note2)	V _{SD}	V _{GS} =0V, I _S =1A	-	-	1.2	V
Diode Forward Current ^(Note1)	I _S		-	-	16	A

Note 1. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Note 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 3. Guaranteed by design, not subject to product.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

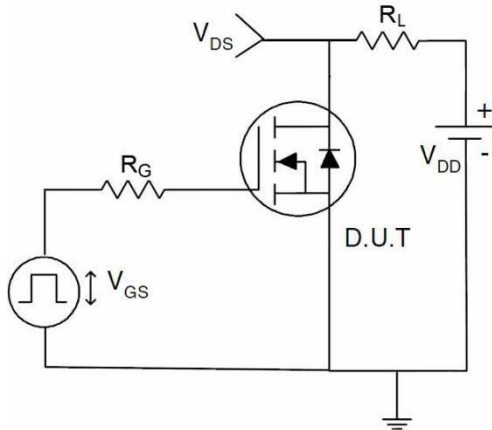


Figure 2. Switching Waveform

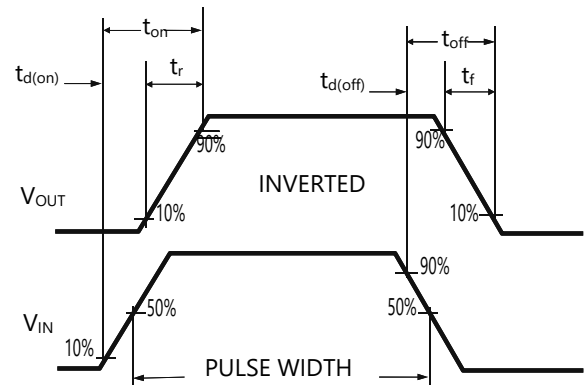


Figure 3. Power Dissipation

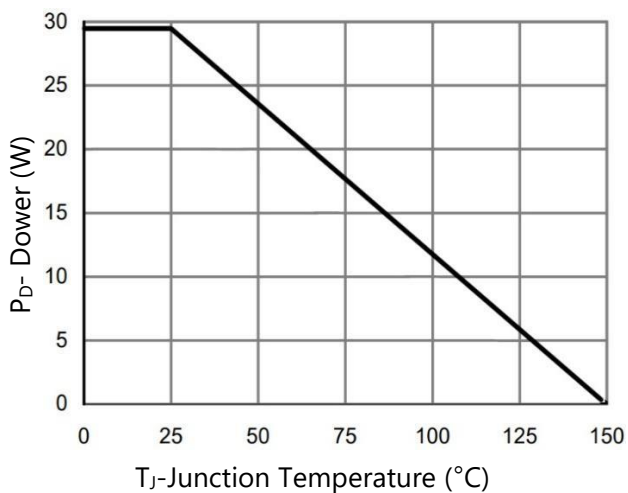


Figure 4. Drain Current

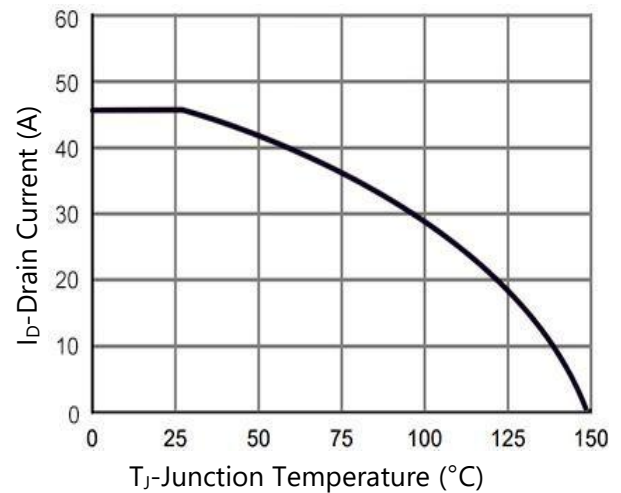


Figure 5. Output Characteristics

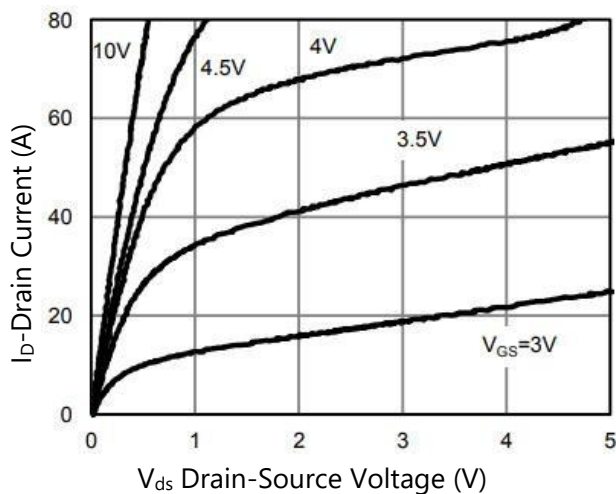
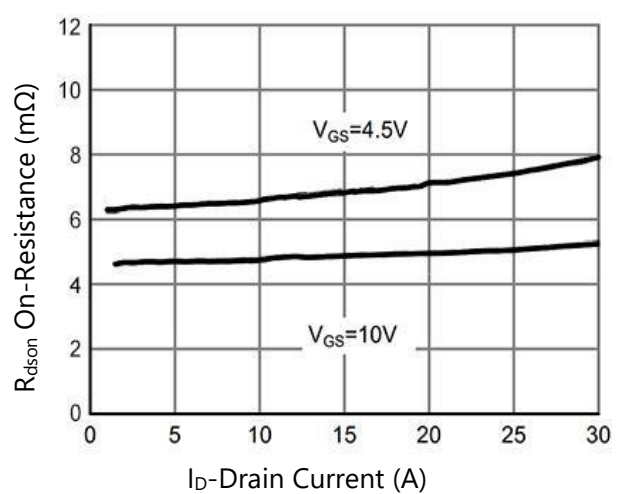


Figure 6. R_{ds(on)} vs Drain Current





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

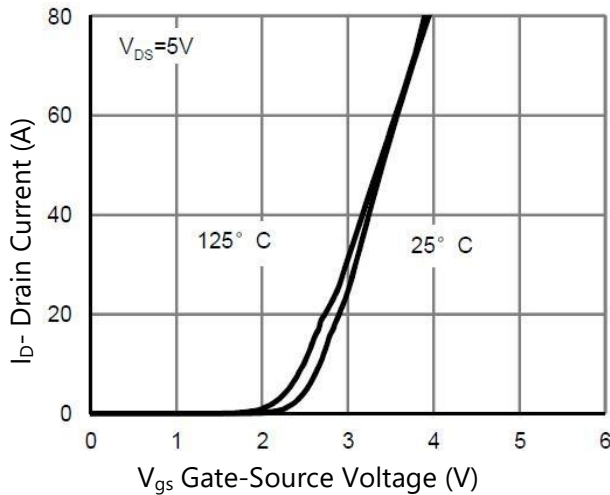


Figure 8. R_{dson} vs Junction Temperature

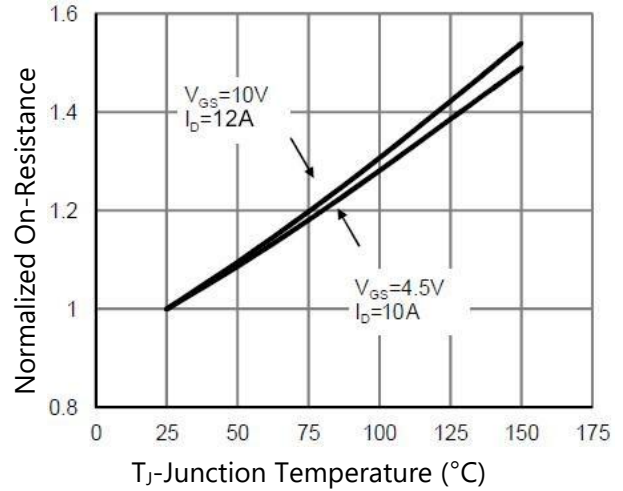


Figure 9. R_{dson} vs V_{GS}

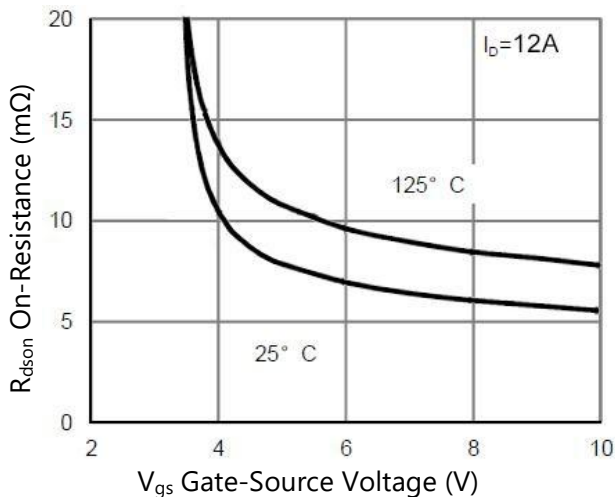


Figure 10. Capacitance vs V_{DS}

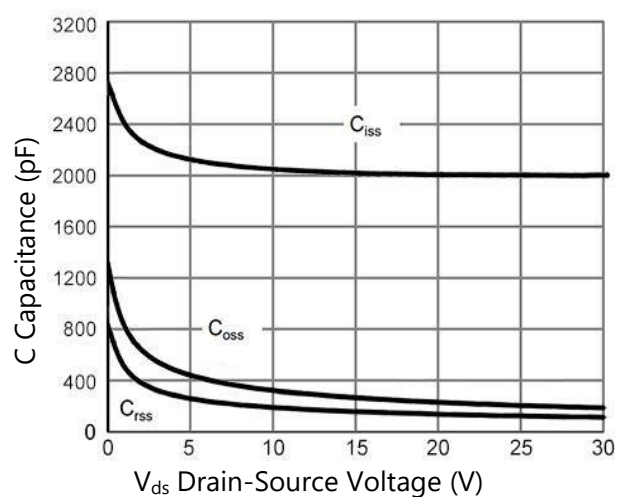


Figure 11. Gate Charge

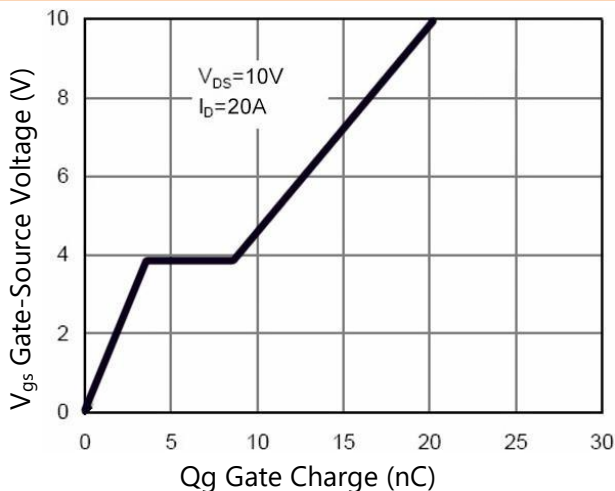
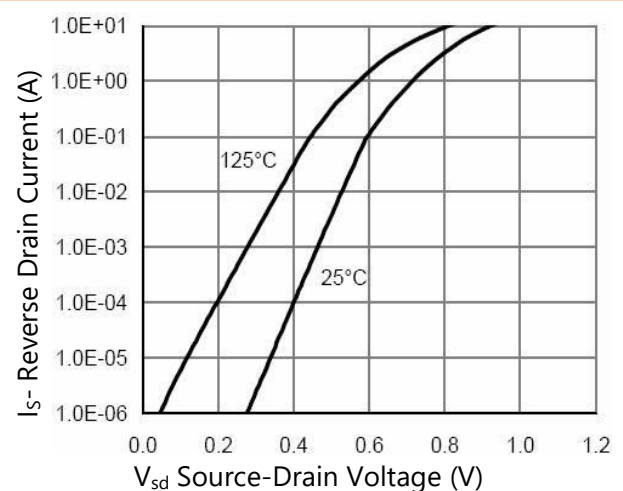


Figure 12. Source- Drain Diode Forward





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 13. Safe Operation Area

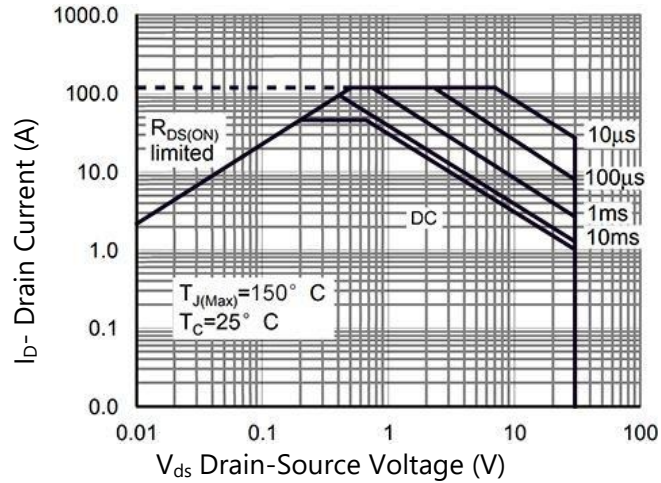
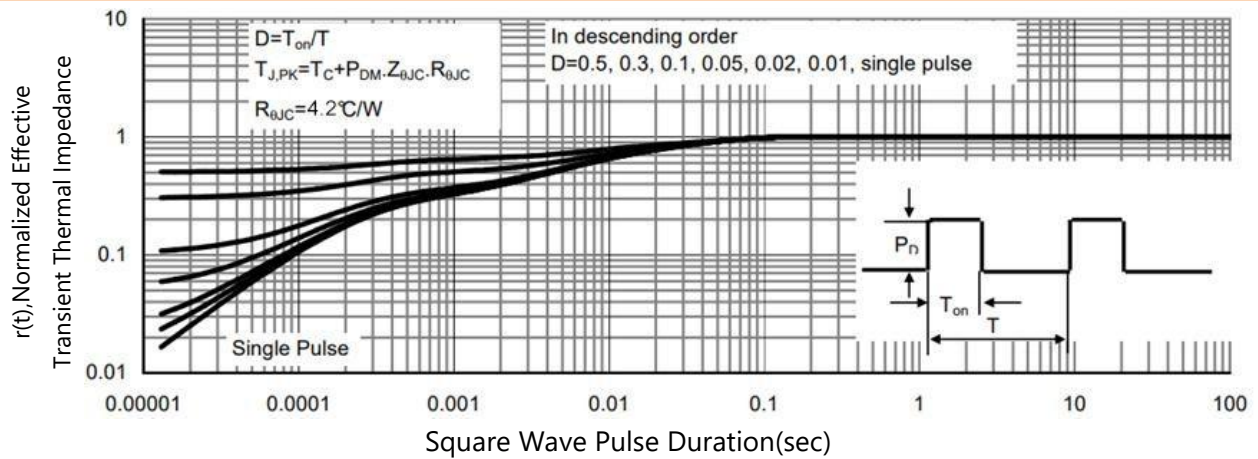


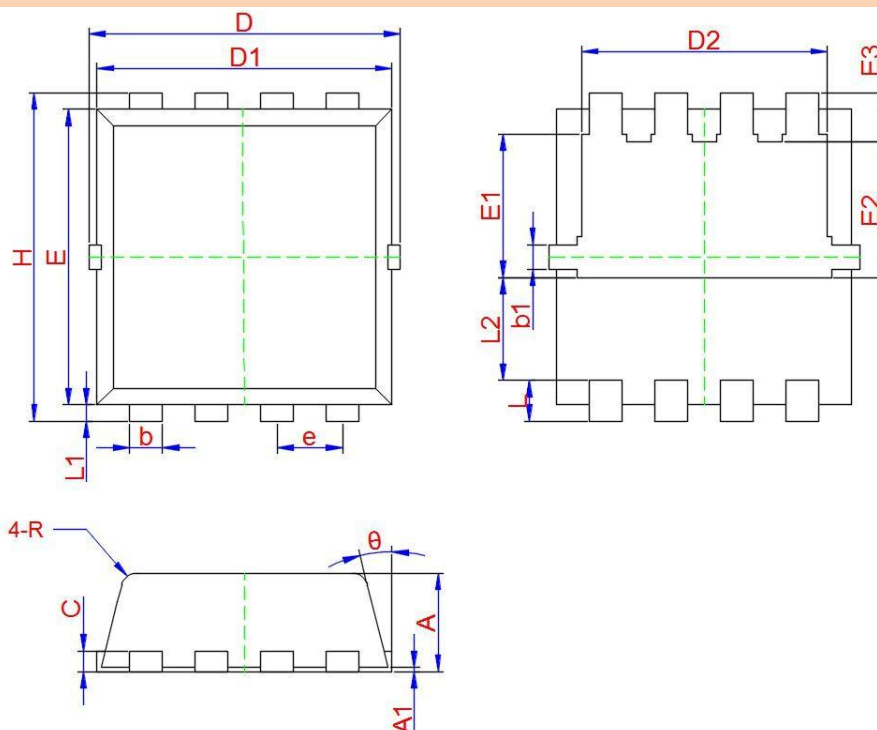
Figure 14. Normalized Maximum Transient Thermal Impedance





PACKAGE INFORMATION

PDFN3.3X3.3-8L



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.700	0.800	0.900
A1	0.000	0.030	0.050
b	0.240	0.300	0.350
b1	0.080	0.130	0.180
c	0.152 TYP.		
D	3.250	3.320	3.400
D1	3.050	3.150	3.250
D2	2.400	2.500	2.600
E	3.000	3.100	3.200
E1	1.350	1.450	1.550
E2	1.200	1.300	1.400
E3	0.400	0.500	0.600
e	0.650 TYP.		
H	3.200	3.300	3.400
L	0.300	0.400	0.500
L1	0.100	0.150	0.200
L2	1.130 TYP.		
R	0.200 TYP.		
θ	6°	10°	14°