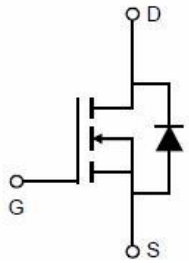
N-Channel Enhancement Mode Power MOSFET

Description

The MXN4015 uses advanced trench technology to provide excellent RDS(ON) and low gate charge . This device can be used for a variety of applications

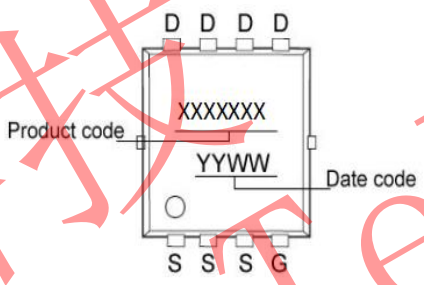


General Features

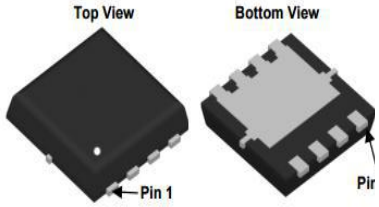
- V_{DS} =40V，I_D =35A
- @V_{GS}=10V $R_{DS(ON)}$(Typ.)=7.4mΩ
- @V_{GS}=4.5V $R_{DS(ON)}$(Typ.)=10mΩ

High power and current handing capability
Lead free product is acquired
Surface mount package

Schematic diagram



Marking and pin assignment



PDFN3X3-8L

Application

PWM applications
Load switch
Power management

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25℃)	I_D	35	A
Drain Current-Continuous(T_A=25℃)	I_{DSM}	15	A
Pulsed Drain Current (Note 1)	I_{DM}	110	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

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Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	40	℃/W

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	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A	-	7.4	9	mΩ
		V_{GS}=4.5V, I_D=11A	-	10	12.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=15A	-	64	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	1820	-	PF
Output Capacitance	C_{oss}		-	510	-	PF
Reverse Transfer Capacitance	C_{rss}		-	40	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=20V, R_L=0.75Ω V_{GS}=10V,R_{GEN}=3Ω	-	7.2	-	nS
Turn-on Rise Time	t_r		-	3	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	23	-	nS
Turn-Off Fall Time	t_f		-	3.5	-	nS
Total Gate Charge	Q_g	V_{DS}=25V,I_D=15A, V_{GS}=10V	-	26	-	nC
Gate-Source Charge	Q_{gs}		-	4	-	nC
Gate-Drain Charge	Q_{gd}		-	6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=20A	-	-	1.2	V

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

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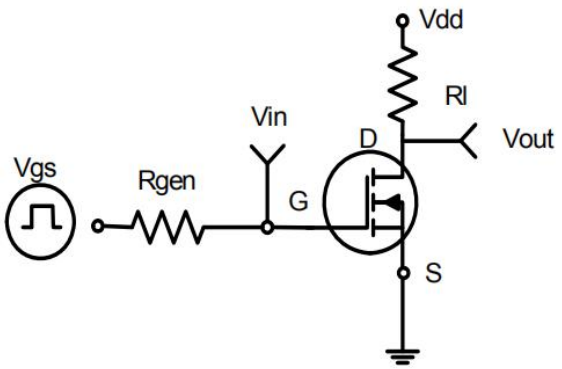

Figure 1:Switching Test Circuit

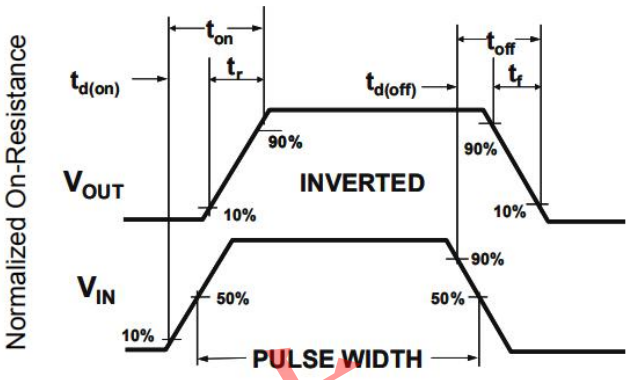

Figure 2:Switching Waveforms

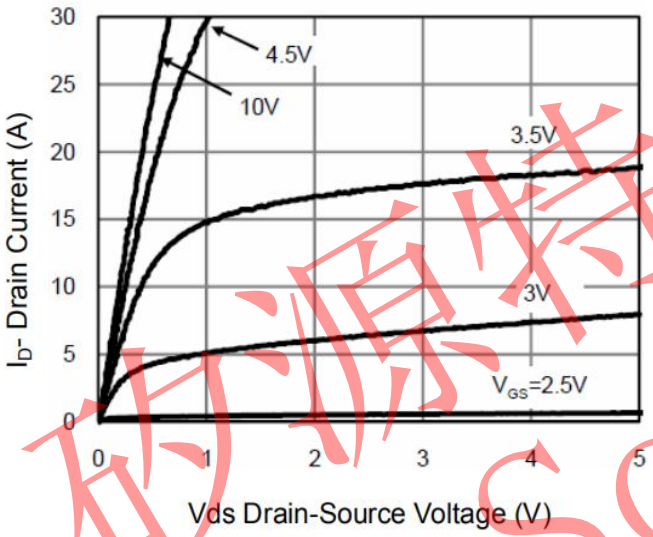

Figure 3 Output Characteristics

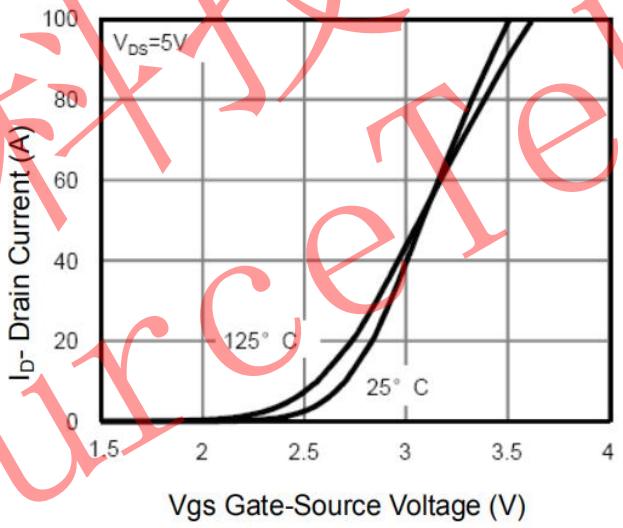

Figure 4 Transfer Characteristics

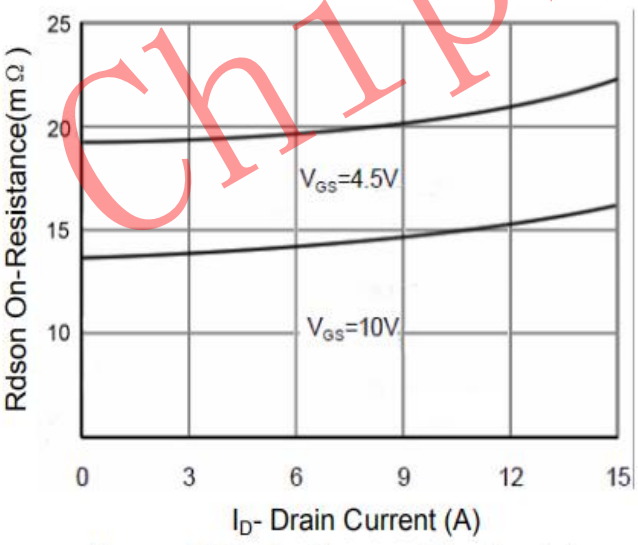

Figure 5 Drain-Source On-Resistance

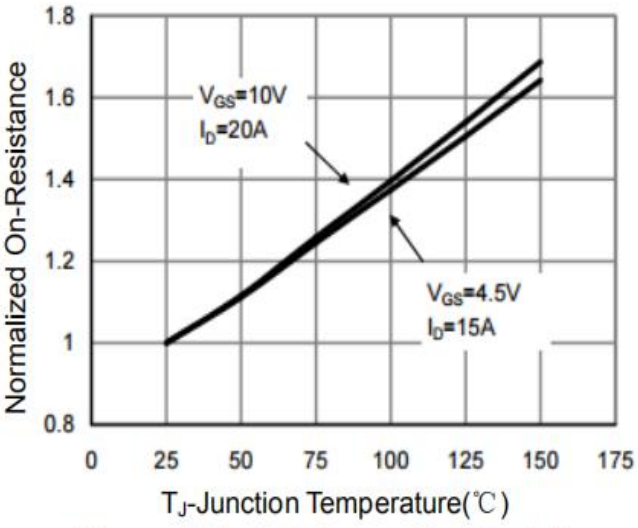

Figure 6 Drain-Source On-Resistance

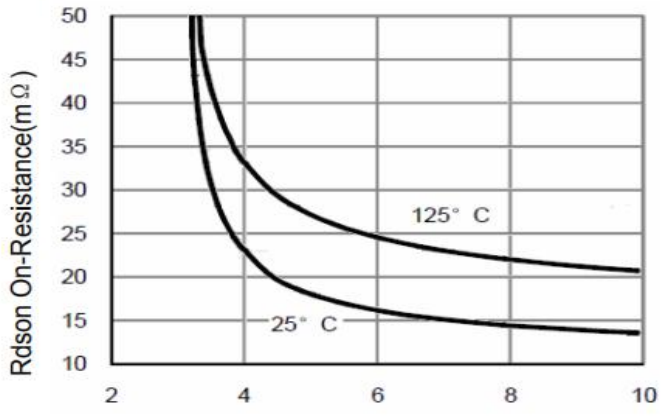

Figure7 Rdson vs Vgs

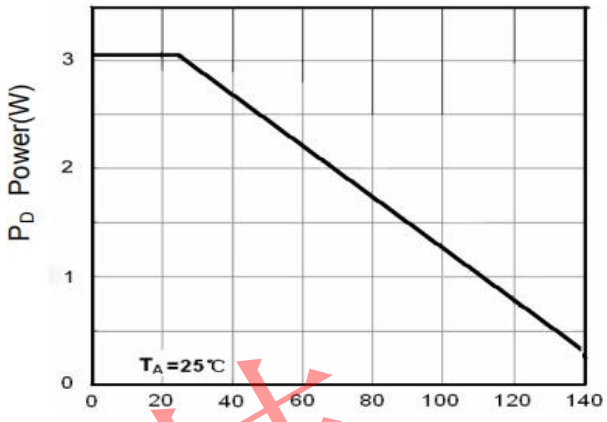

Figure 8 Power Dissipation

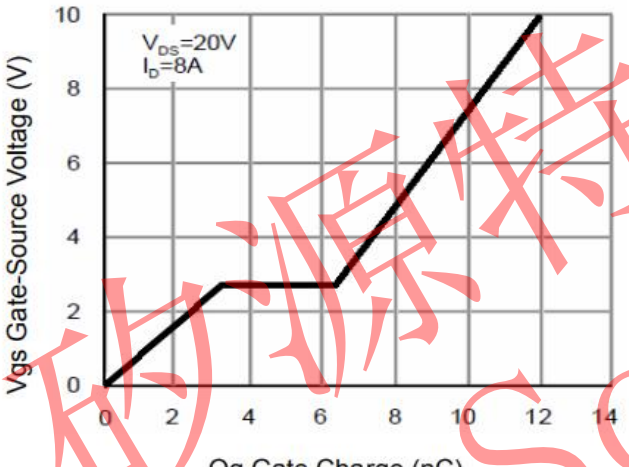

Figure 9 Gate Charge

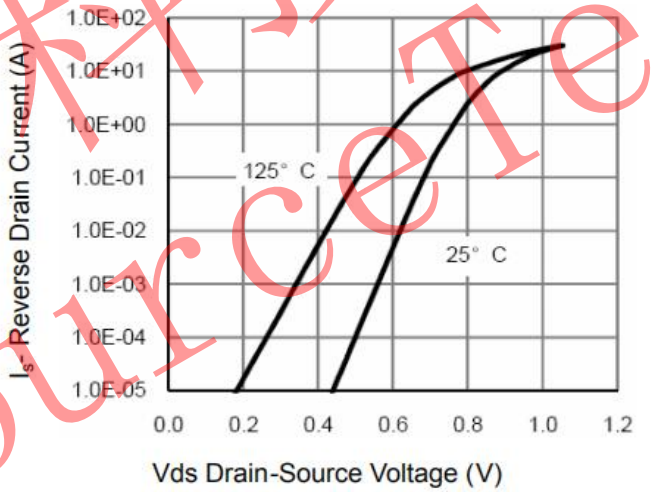

Figure 10 Source- Drain Diode Forward

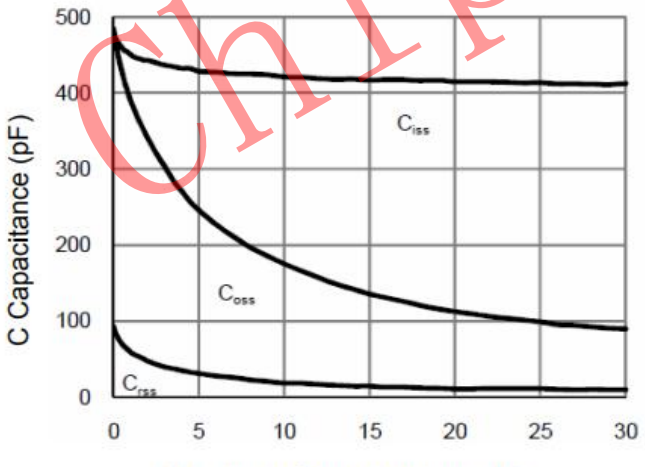

Figure 11 Capacitance vs Vds

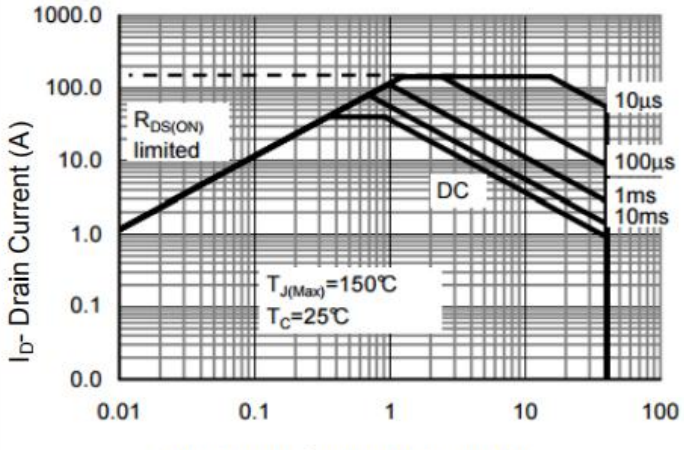

Figure 12 Safe Operation Area

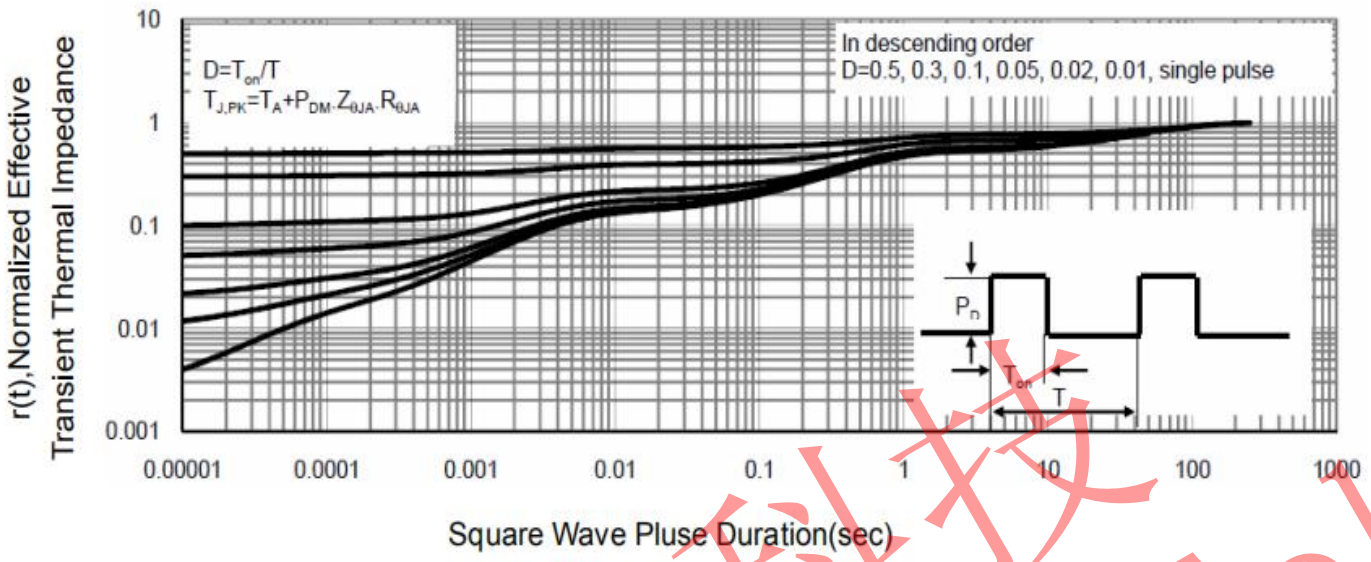

Figure 13 Normalized Maximum Transient Thermal Impedance

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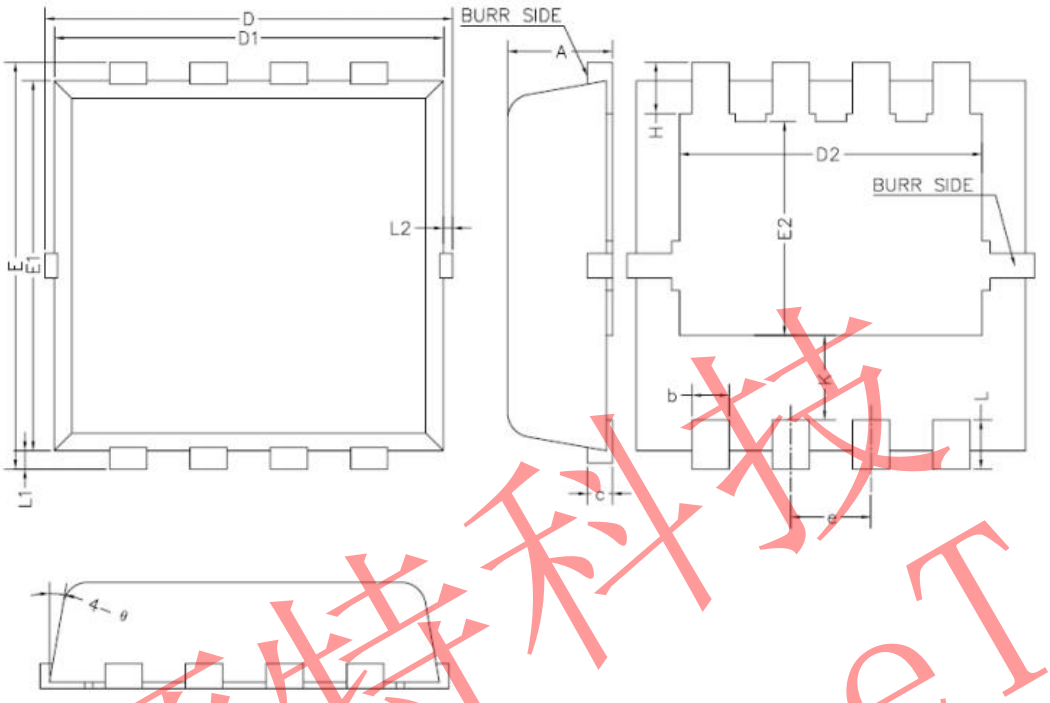

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
b	0.25	0.30	0.35
c	0.14	0.15	0.20
D	3.10	3.30	3.50
D1	3.05	3.15	3.25
D2	2.35	2.45	2.55
e	0.55	0.65	0.75
E	3.10	3.30	3.50
E1	2.90	3.00	3.10
E2	1.64	1.74	1.84
H	0.32	0.42	0.52
K	0.59	0.69	0.79
L	0.25	0.40	0.55
L1	0.10	0.15	0.20
L2	–	–	0.15
θ	8°	10°	12°