DESCRIPTION

The MXN035N02 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a wide variety of applications.

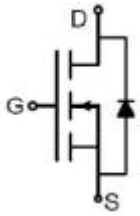
GENERAL FEATURES

- V_{DS}=20V, I_D=56A
  $R_{DS(ON)}$(Typ.)=4.7mΩ @ VGS=2.5V
  $R_{DS(ON)}$(Typ.)=3.5mΩ @ VGS=4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

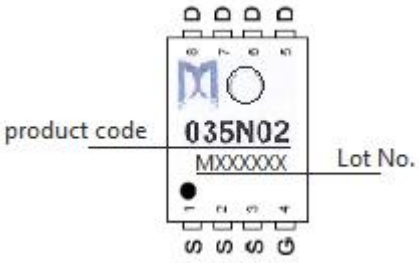
APPLICATION

- Battery Protection
- Load switch
- Power management

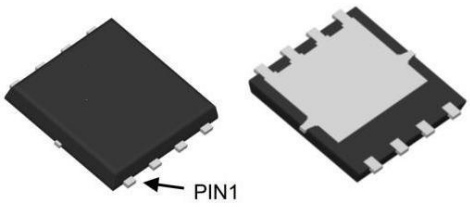
PINOUT



Schematic diagram



Marking and Pin Assignment



DFN5X6-8L top & bottom view

ORDERING INFORMATION

Device	Marking	StorageTemperature	Package	Devices Per Reel
MXN035N02	035N02	-55°C to 150°C	DFN5X6-8L	2500

KEY PERFORMANCE PARAMETERS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage(V_{GS}=0V)	V_{DS}	20	V
Gate-Source Voltage(V_{DS}=0V)	V_{GS}	±12	V
Drain Current-Continuous(T_C=25°C)(Note1)	I_D	56	A
Drain Current-Continuous(T_C=100°C)	I_D	35.5	A
Drain Current-Continuous@Current-Pulsed(Note2)	$I_{DM(pluse)}$	224	A
Maximum Power Dissipation(T_C=25°C)	P_D	43.1	W
Maximum Power Dissipation(T_C=100°C)	P_D	17.2	W
Single Pulse Avalanche Energy(Note3)	E_{AS}	340	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTIC

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.9	°C/W

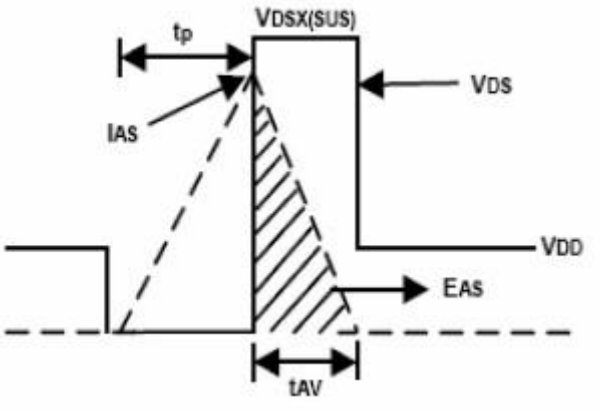
Notes 1.The maximum current rating is package limited.
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature
Notes 3.E_{AS} condition: T_J=25°C,V_{DD}=30V,V_G=4.5V, R_G=25Ω,

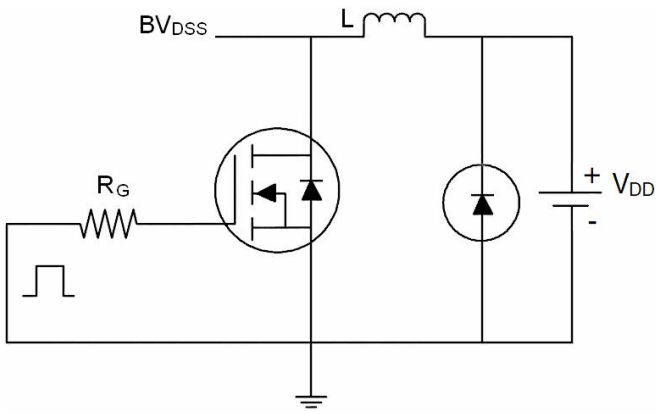
ELECTRICAL CHARACTERISTICS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20	23	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	1.1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=2.5V,I_D=15A	-	4.7	8.9	mΩ
		V_{GS}=4.5V,I_D=20A,T_C=125°C	-	5.1	8.9	mΩ
		V_{GS}=4.5V,I_D=20A,T_C=25°C	-	3.5	4.9	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=15A	-	40	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	2800	-	pF
Output Capacitance	C_{oss}		-	353	-	pF
Reverse Transfer Capacitance	C_{rss}		-	265	-	pF
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,F=1.0MHz	-	1.1	-	Ω
Total Gate Charge	Q_g	V_{DS}=10V, I_D=12A, V_{GS}=4.5V	-	32	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	nC
Gate-Drain Charge	Q_{gd}		-	11	-	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V, R_L=0.75Ω V_{GS}=4.5V,R_{GEN}=3Ω	-	17	-	nS
Turn-on Rise Time	t_r		-	49	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	74	-	nS
Turn-Off Fall Time	t_f		-	26	-	nS
Source-Drain Diode Characteristics						
Source-Drain Current(Body Diode)	I_{SD}		-	-	54	A
Forward On Voltage	V_{SD}	V_{GS}=0V, I_{SD}=20A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=100A/μs	-	23	-	nS
Reverse Recovery Charge	Q_{rr}		-	10	-	nC

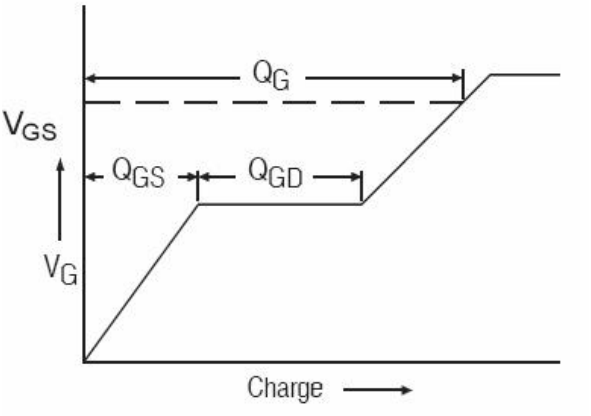
TEST CIRCUIT

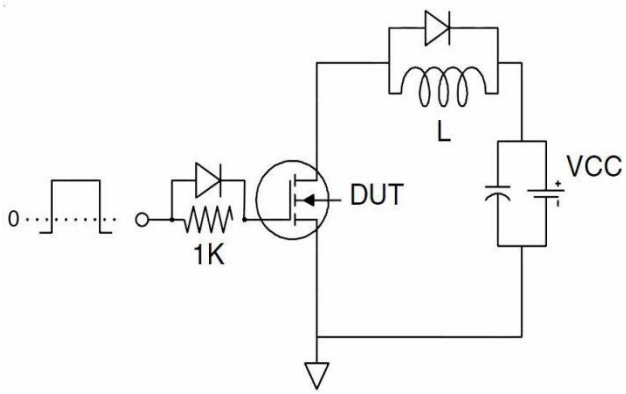
1) E_{AS} Test Circuits



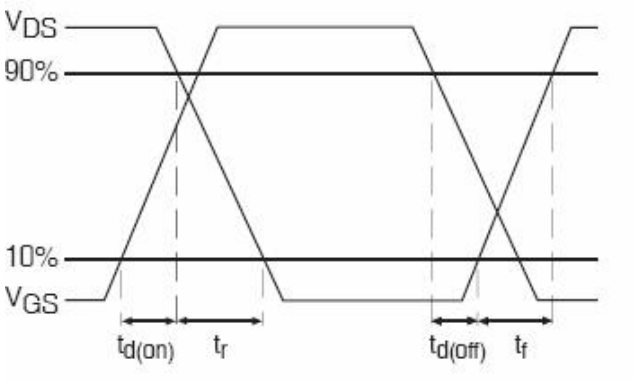


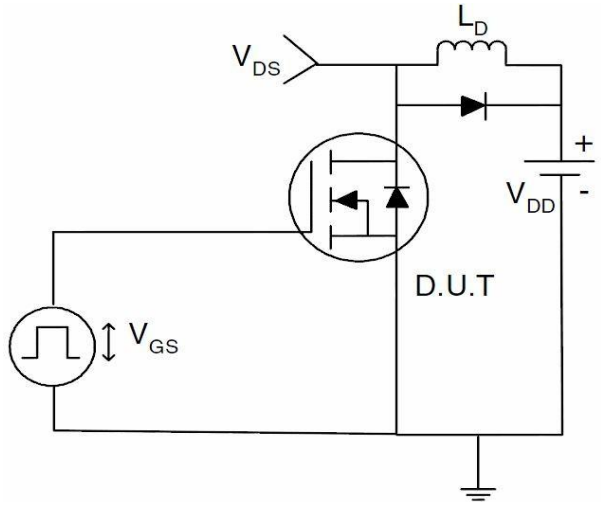
2) Gate Charge Test Circuit





3) Switch Time Test Circuit





TYPICAL PERFORMANCE CHARACTERISTICS

Figure1. Output Characteristics

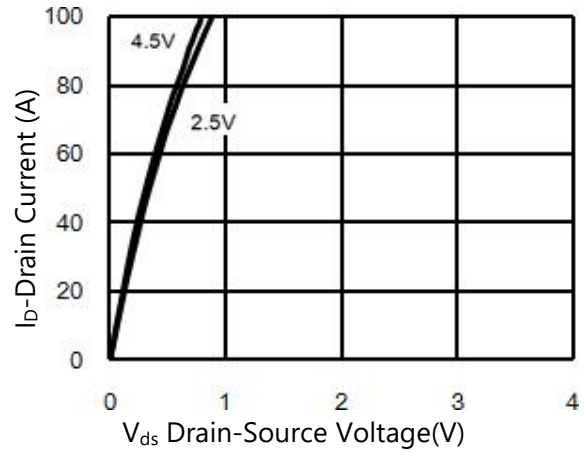


Figure2. Transfer Characteristics

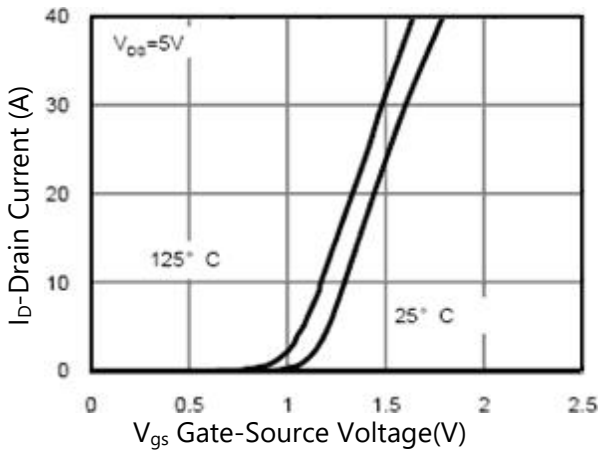


Figure3. BV_{DSS} vs Junction Temperature

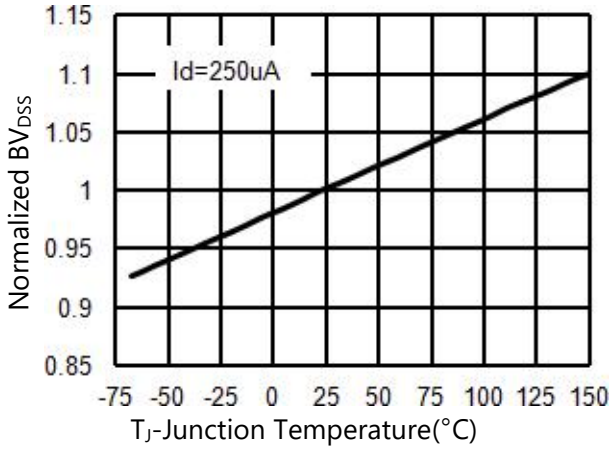


Figure4. Drain Current

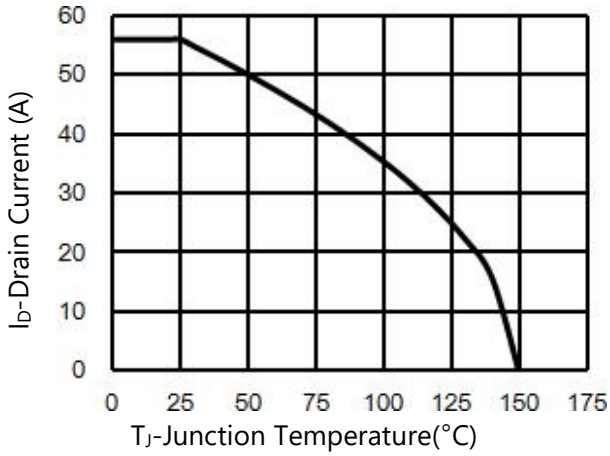


Figure5. $V_{GS(th)}$ vs Junction Temperature

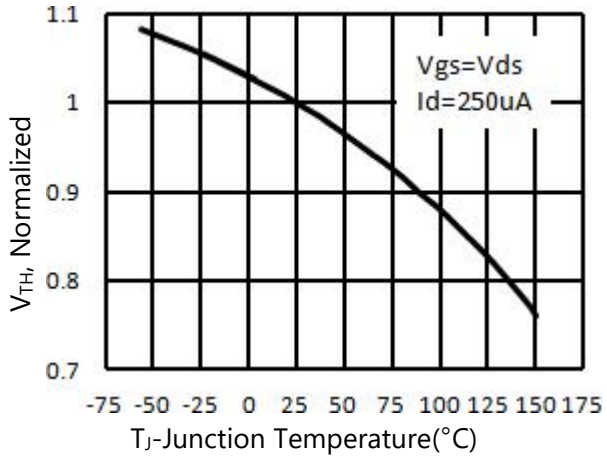
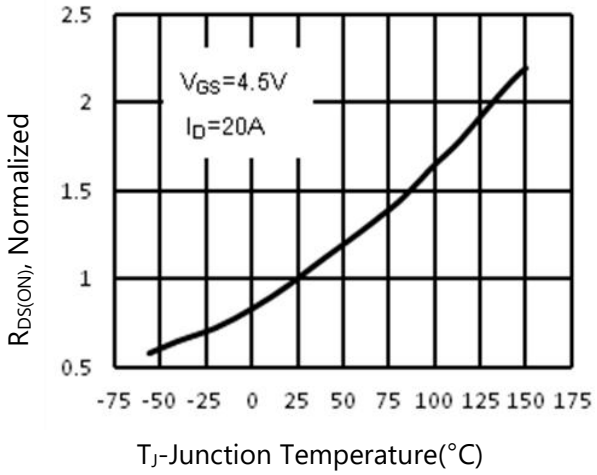


Figure6. $R_{DS(ON)}$ vs Junction Temperature



TYPICAL PERFORMANCE CHARACTERISTICS

Figure7. Gate Charge Waveforms

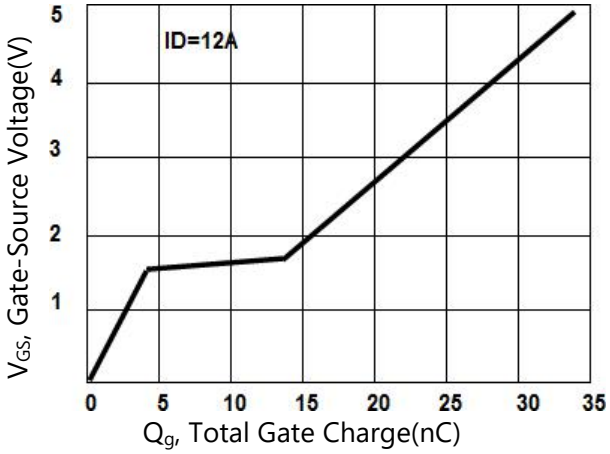


Figure8. Capacitance

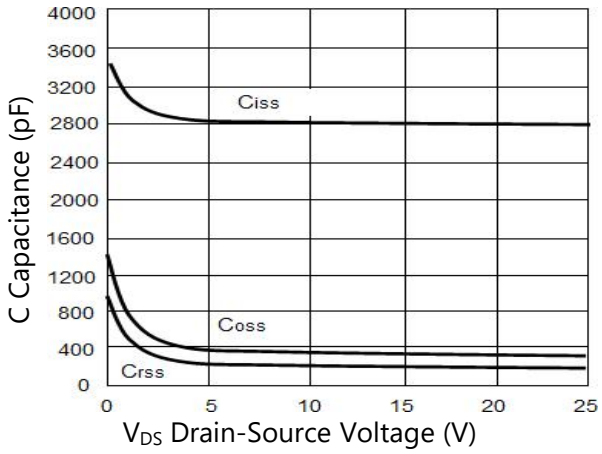


Figure9. Body Diode Forward

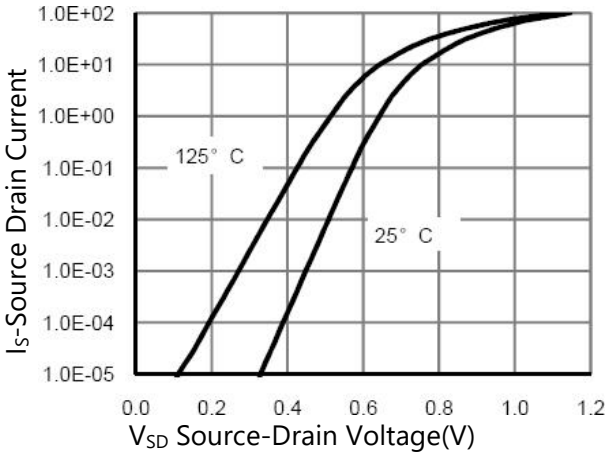
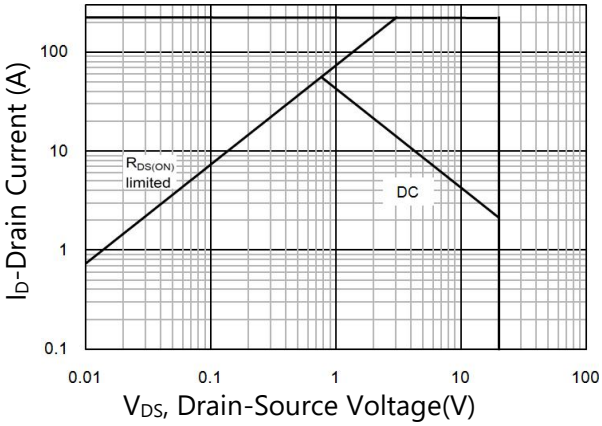
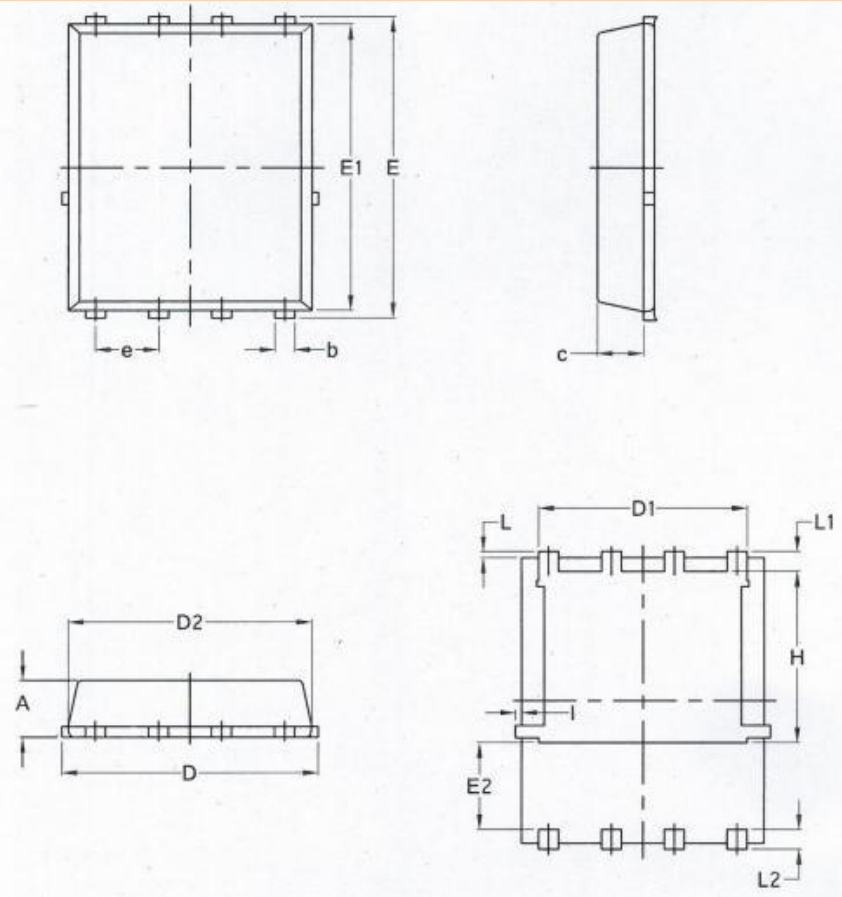


Figure10. Maximum Safe Operating Area



PACKAGE INFORMATION

DFN5X6-8L



SYMBOL	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	-	0.0630	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	-	0.18	-	0.0070