

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.

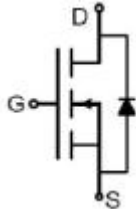
GENERAL FEATURES

- $V_{DS}=20V$, $I_D=100A$
 $R_{DS(ON)}(Typ.)=4.7m\Omega$ @ $V_{GS}=2.5V$
 $R_{DS(ON)}(Typ.)=3.5m\Omega$ @ $V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

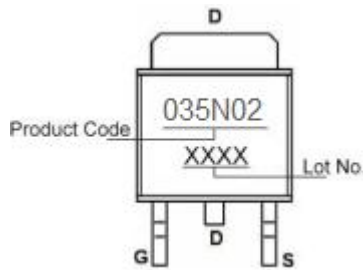
APPLICATION

- Battery Protection
- Load switch
- Power management

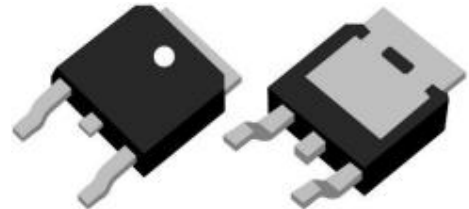
PINOUT



Schematic diagram



Marking and Pin Assignment



TO-252-2L top & bottom view

ORDERING INFORMATION

Device	Marking	Storage Temperature	Package	Devices Per Reel
MXD035N02	035N02	-55°C to 150°C	TO-252-2L	2500

KEY PERFORMANCE PARAMETERS ($T_A=25^\circ C$ 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 ($T_C=25^\circ C$) ^(Note1)	I_D	100	A
Drain Current-Continuous ($T_C=100^\circ C$)	I_D	35.5	A
Drain Current-Continuous@Current-Pulsed ^(Note2)	$I_{DM(pluse)}$	224	A
Maximum Power Dissipation ($T_C=25^\circ C$)	P_D	43.1	W
Maximum Power Dissipation ($T_C=100^\circ C$)	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	$^\circ C$

THERMAL CHARACTERISTIC

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

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

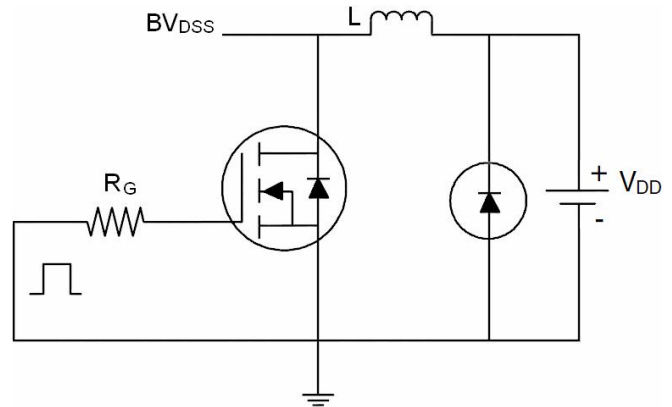
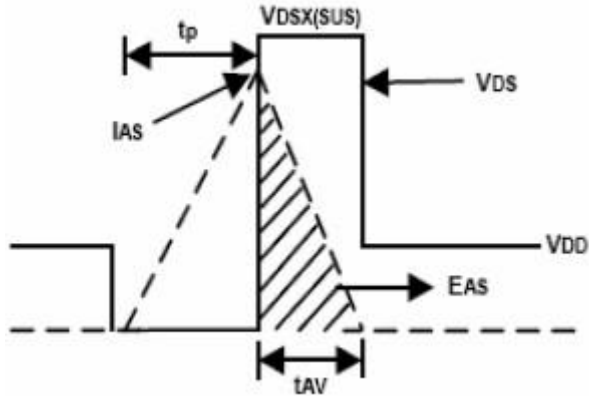
Notes 3. E_{AS} condition: $T_J=25^\circ C$, $V_{DD}=30V$, $V_G=4.5V$, $R_G=25\Omega$,


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

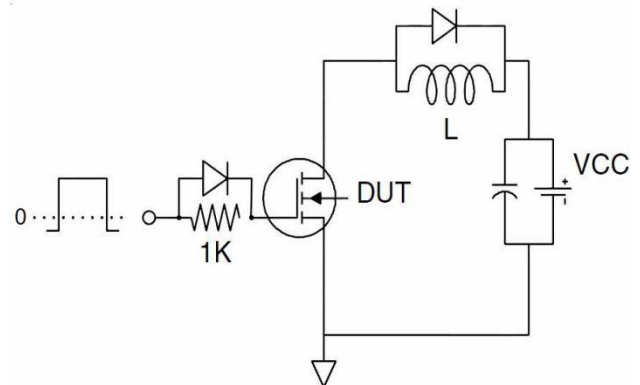
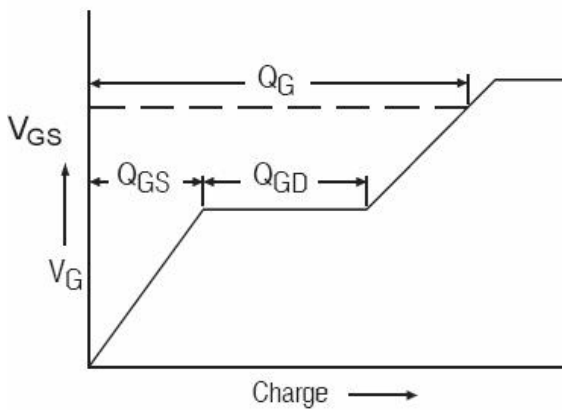
Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	23	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Gate 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

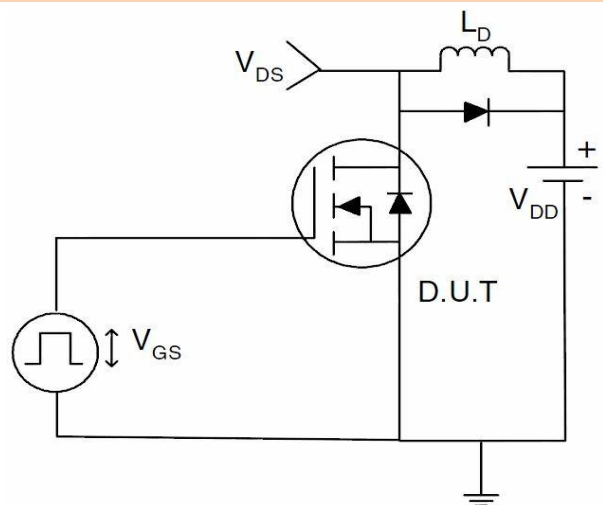
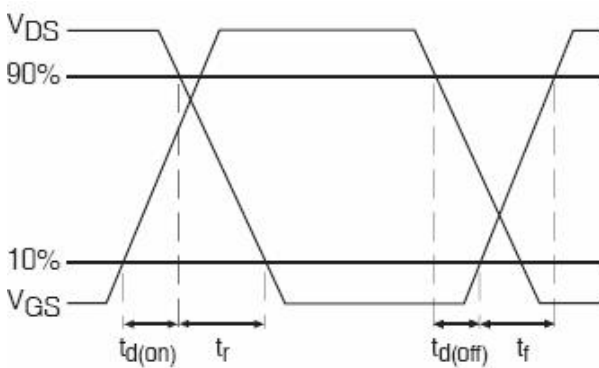
1) EAS Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit





TYPICAL PERFORMANCE CHARACTERISTICS

Figure1. Output Characteristics

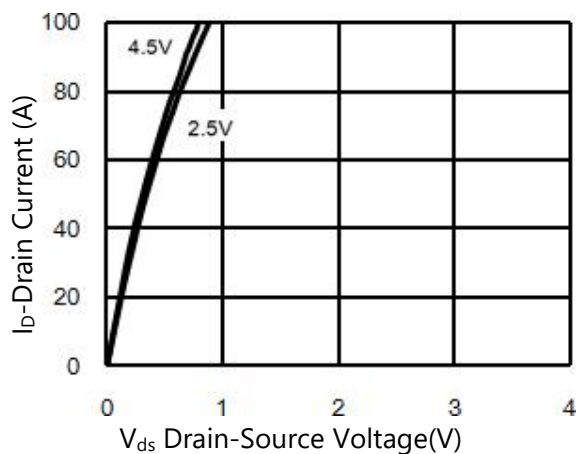


Figure2. Transfer Characteristics

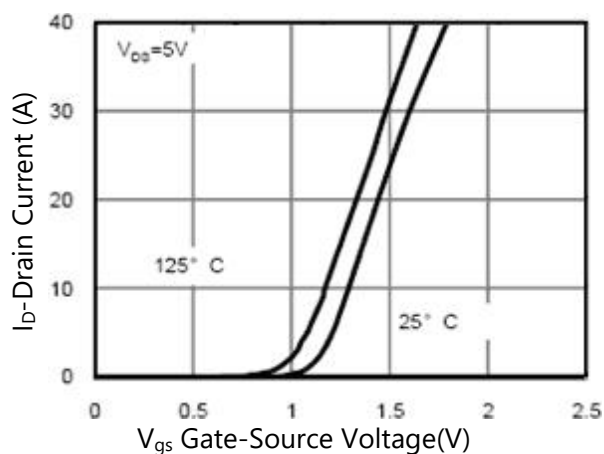


Figure3. BV_{DSS} vs Junction Temperature

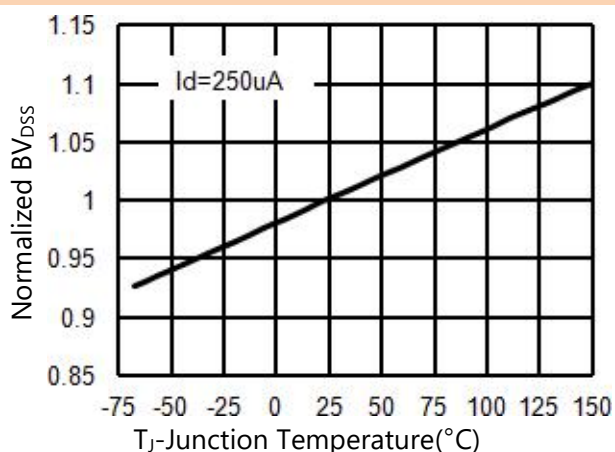


Figure4. Drain Current

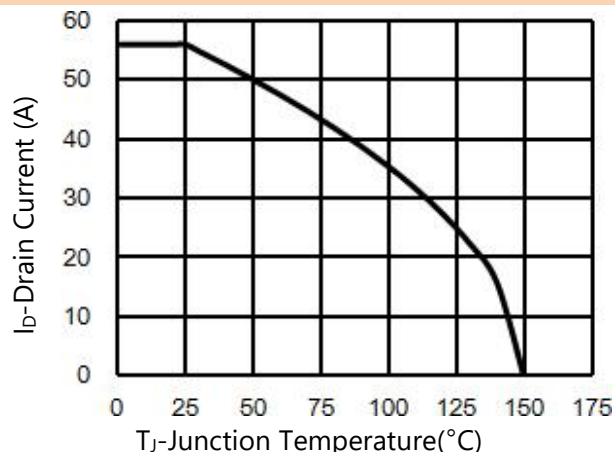


Figure5. $V_{GS(th)}$ vs Junction Temperature

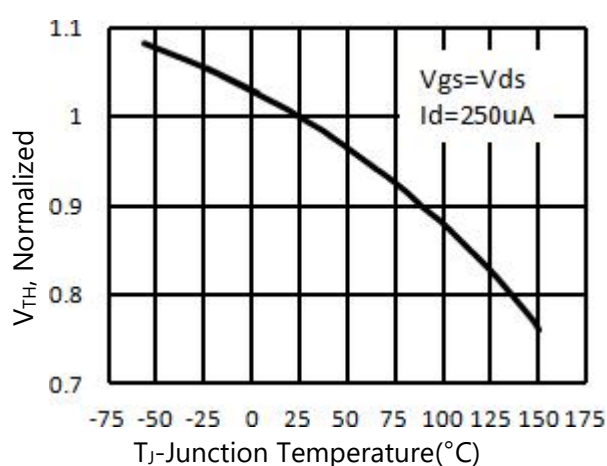
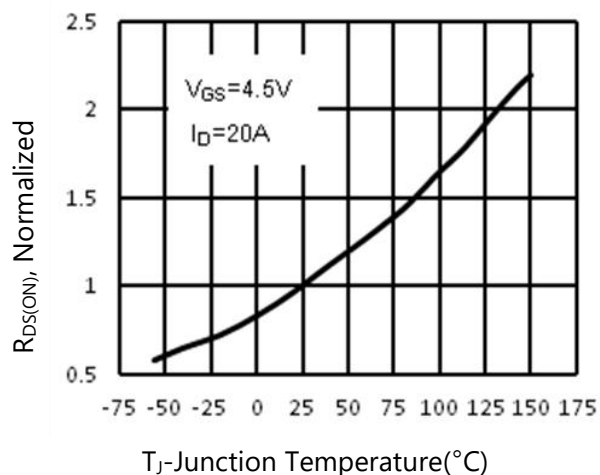


Figure6. $R_{DS(on)}$ vs Junction Temperature





TYPICAL PERFORMANCE CHARACTERISTICS

Figure7. Gate Charge Waveforms

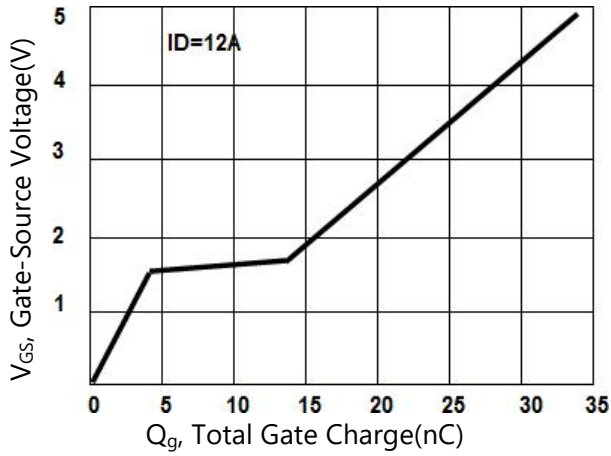


Figure8. Capacitance

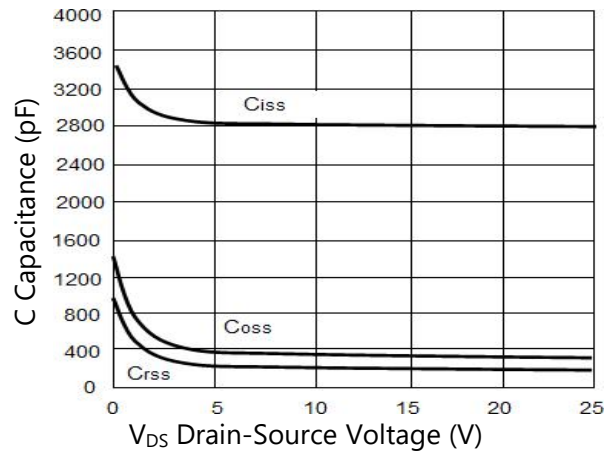


Figure9. Body Diode Forward

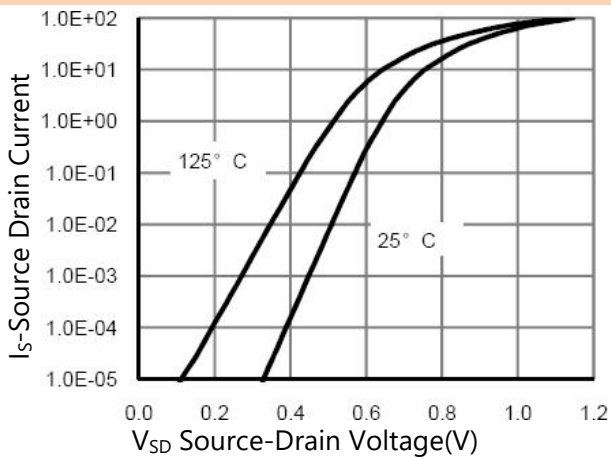
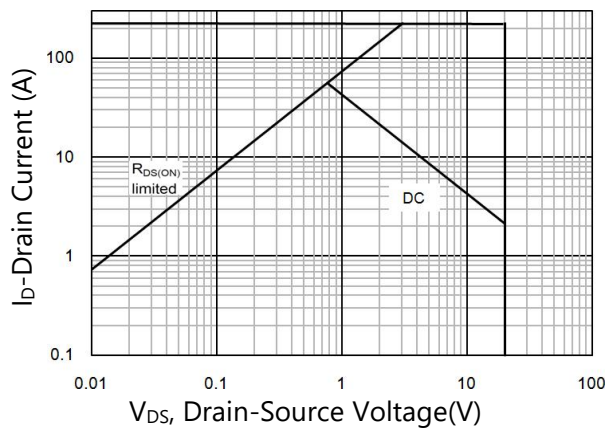


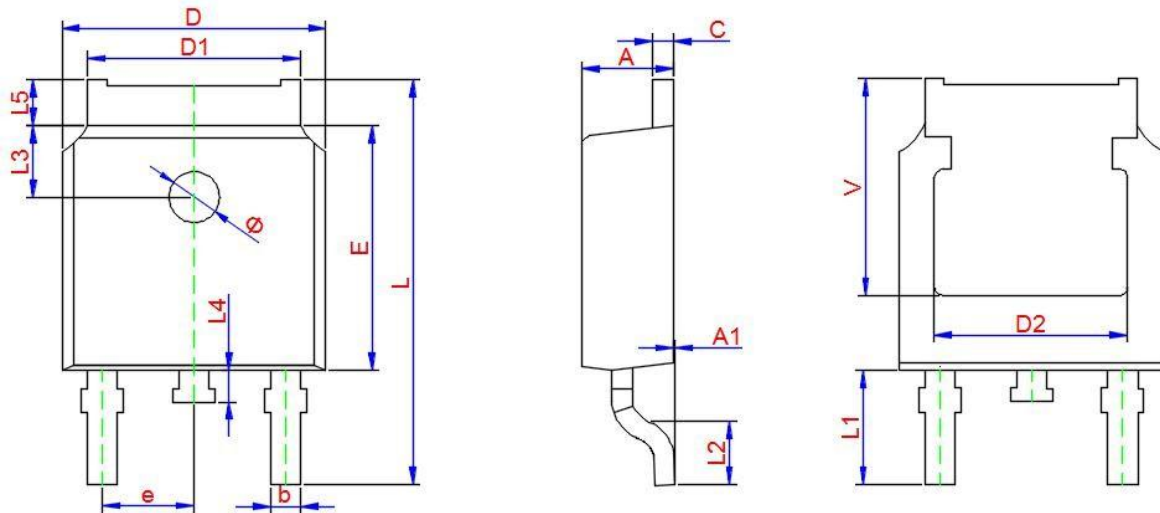
Figure10. Maximum Safe Operating Area





PACKAGE INFORMATION

TO-252-2L



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	2.200	2.300	2.400
A1	0.000	-	0.127
D	6.500	6.600	6.700
D1	5.100	5.330	5.460
C	0.450	0.500	0.600
D2	4.830 TYP.		
E	6.000	6.100	6.200
e	2.186	2.286	2.386
L	9.800	10.100	10.400
L1	2.900 TYP.		
L2	1.400	1.500	1.600
L3	1.800 TYP.		
L4	0.600	0.800	1.000
L5	0.900	-	1.250
Φ	1.100.	-	1.300
θ	0°	-	8°
V	5.350		