DESCRIPTION

The MXD80N04 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 Battery protection or in other Switching application.

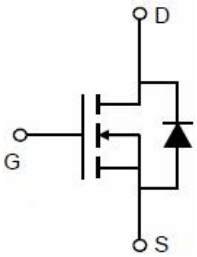
GENERAL FEATURES

- V_{DS}=20V, I_D=15A
  $R_{DS(ON)}$(Typ.)=8.8mΩ @ V_{GS}=2.5V
  $R_{DS(ON)}$(Typ.)=6.3mΩ @ V_{GS}=4.5V

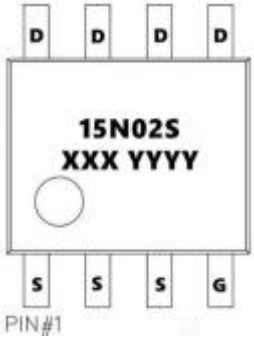
APPLICATION

- Battery protection
- Load switch
- Uninterruptible power supply

PINOUT



Schematic diagram



Marking and pin Assignment


SOP-8L top and bottom view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MX15N02	-55°C to 175°C	SOP-8L	3000

ABSOLUTE MAXIMUM RATINGS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	15	A
Drain Current-Continuous(T_C=100°C)	I_D	12	A
Pulsed Drain Current(Note1)	I_{DM}	45	A
Single Pulse Avalanche Energy(Note2)	E_{AS}	36	mJ
Power Dissipation	P_D	31	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.84	°C/W

Note1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
Note2. E_{AS} condition: T_J=25°C, V_{DD}=10V, V_G=4.5V, L=0.5mH, R_G=25Ω, I_{AS}=12A

ELECTRICAL CHARACTERISTICS(T_J=25°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	20	22	-	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
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.7	1.1	V
Drain-Source On-State Resistance(Note3)	$R_{DS(ON)}$	V_{GS}=2.5V, I_D=10A	-	8.8	13	mΩ
		V_{GS}=4.5V, I_D=25A	-	6.3	8.0	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, F=1.0MHz	-	1458	-	pF
Output Capacitance	C_{oss}		-	238	-	pF
Reverse Transfer Capacitance	C_{rss}		-	212	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, I_D=10A, V_{GS}=4.5V,R_{GEN}=3Ω	-	10	-	nS
Turn-on Rise Time	t_r		-	21	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	39	-	nS
Turn-Off Fall Time	t_f		-	19	-	nS
Total Gate Charge	Q_g	V_{DS}=10V, I_D=25A, V_{GS}=4.5V	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	nC
Gate-Drain Charge	Q_{gd}		-	6.4	-	nC
Drain-Source Diode Characteristics						
Continuous Source Current	I_S		-	-	50	A
Pulsed Source Current	I_{SM}		-	-	200	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=100μs	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	20	-	nC

Note3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Output Characteristics

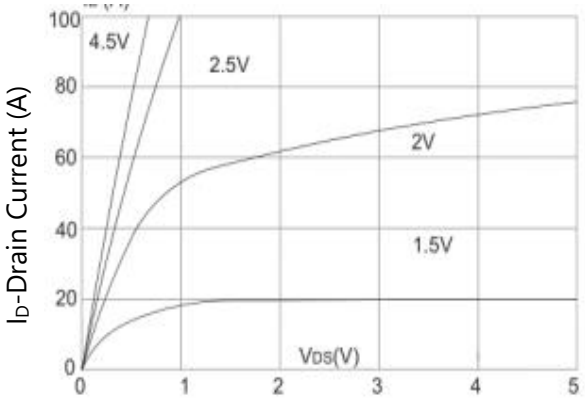


Figure 2. Typical Transfer Characteristics

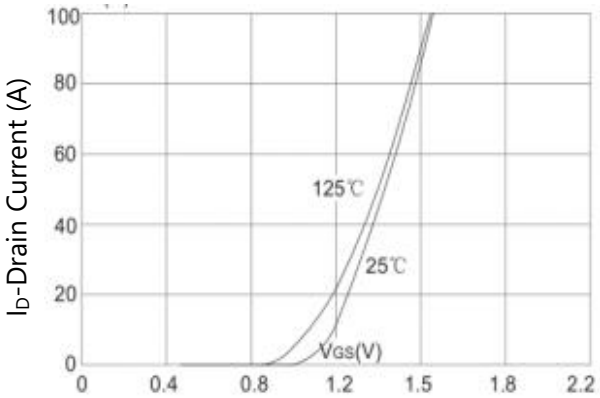


Figure 3. Gate Charge

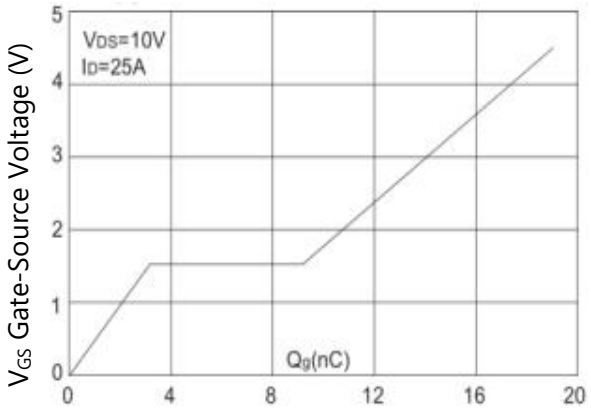


Figure 4. Capacitance vs V_{DS}

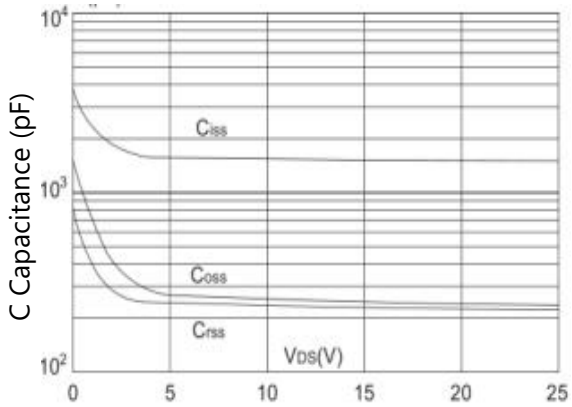


Figure 5. Body Diode Characteristics

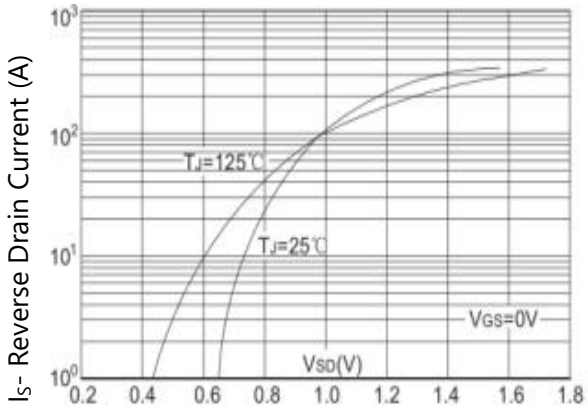
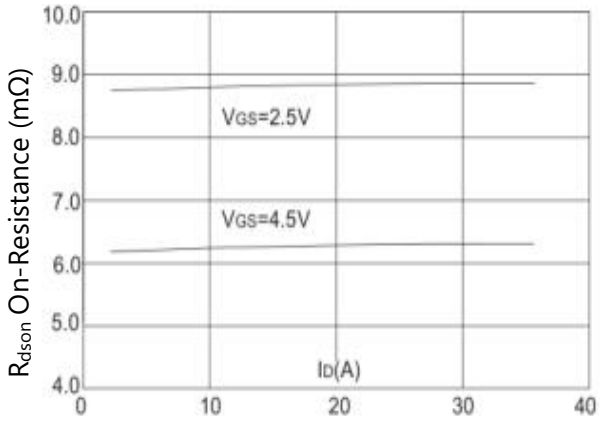
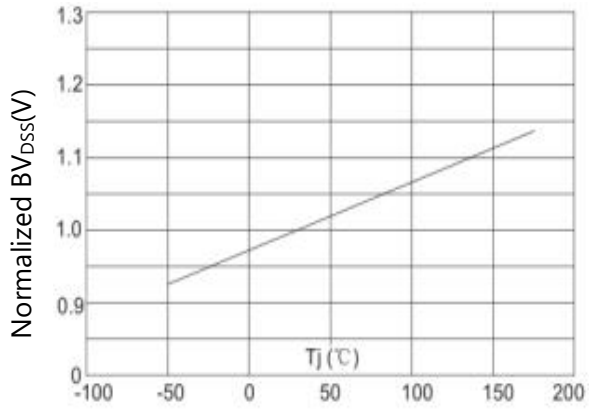


Figure 6. On-resistance vs. Drain Current



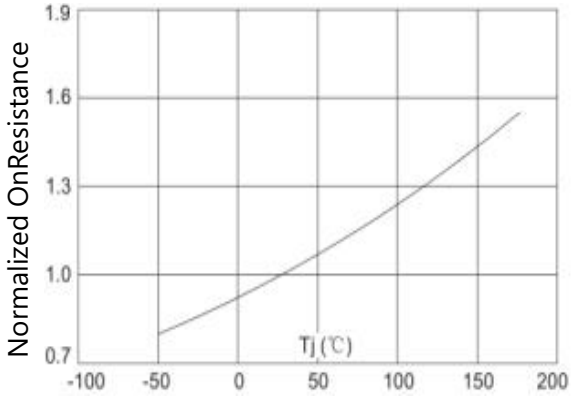
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. BV_{DSS} vs Junction Temperature



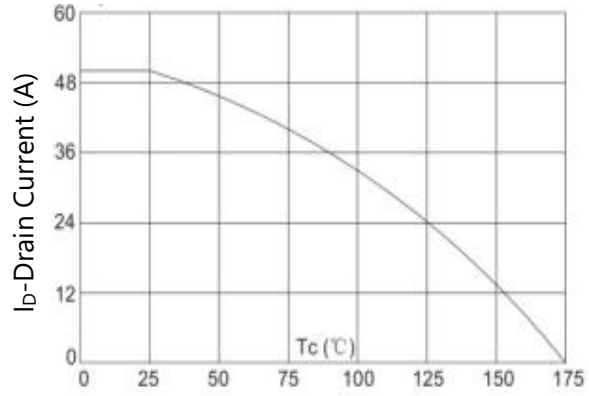
T_J-Junction Temperature(°C)

Figure 8. R_{DSON} vs Junction Temperature



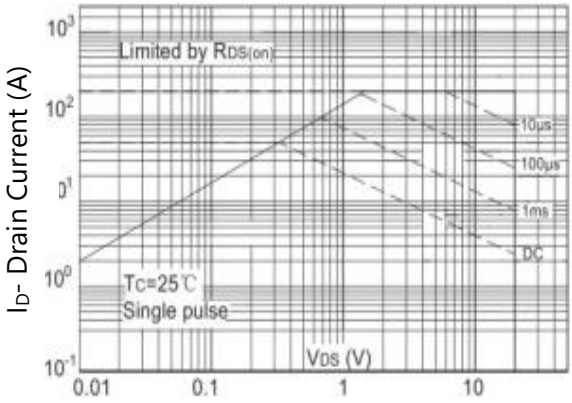
T_J-Junction Temperature(°C)

Figure 9. Capacitance vs V_{DS}



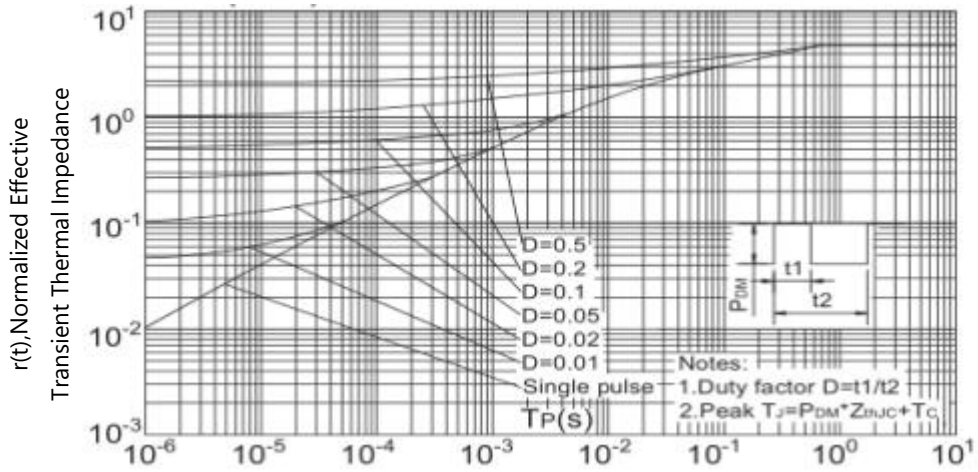
T_C-Case Temperature(°C)

Figure 10. Safe Operation Area



V_{DS} Drain-Source Voltage (V)

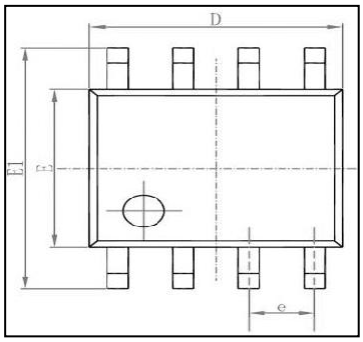
Figure 11. Normalized Maximum Transient Thermal Impedance

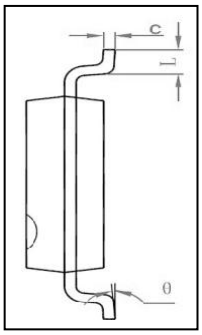


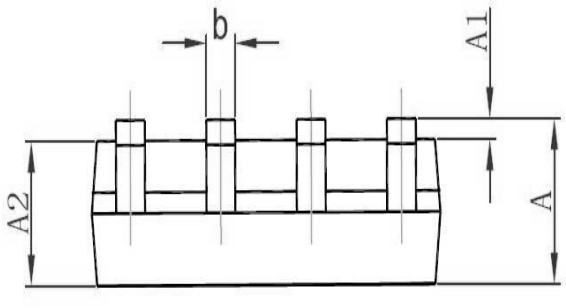
Square Wave Pulse Duration(sec)

PACKAGE INFORMATION

SOP-8L







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°