DESCRIPTION

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

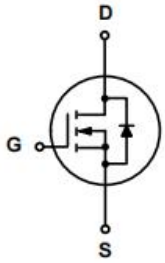
GENERAL FEATURES

- V_{DS}=30V, I_D=80A
  $R_{DS(ON)}$(Typ.)=3.7mΩ @ V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=6mΩ @ V_{GS}=4.5V
- Improved dv/dt capability
- 100% EAS Guaranteed
- Fast switching

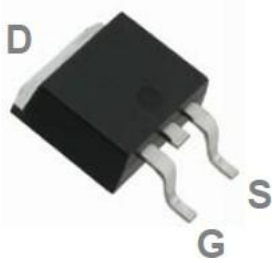
APPLICATION

- NB / VGA / V_{CORE}
- POL Applications
- SMPS 2nd SR

PINOUT



Schematic diagram



TO-252 Top View

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MXD3080K	-55°C to 150°C	TO-252	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(T_C=25°C)	I_D	80	A
Continuous Drain Current(T_C=100°C)	I_D	51	A
Pulsed Drain Current(Note1)	I_{DM}	320	A
Single Pulsed Avalanche Energy(Note2)	E_{AS}	88	mJ
Single Pulsed Avalanche Current(Note2)	I_{AS}	42	A
Power Dissipation(T_C=25°C)	P_D	54	W
Power Dissipation(Derate above 25°C)	P_D	0.43	W/°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
Thermal Resistance, Junction-to-Case(Note1)	$R_{\theta JC}$	2.3	°C/W
Thermal Resistance, Junction-to-Ambient(Note1)	$R_{\theta JA}$	62	°C/W

Note 1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
Note 2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=42A.,R_G=25Ω,Starting T_J=25°C.

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	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
		V_{DS}=24V,V_{GS}=0V,T_J=125°C	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.6	2.5	V
Drain-Source On-State Resistance(Note1)	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	3.7	5	mΩ
		V_{GS}=4.5V, I_D=25A	-	6	9	mΩ
Forward Transconductance	g_{fs}	V_{GS}=10V, I_D=10A	-	18	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1.0MHz	-	1160	-	pF
Output Capacitance	C_{oss}		-	200	-	pF
Reverse Transfer Capacitance	C_{rss}		-	180	-	pF
Switching Characteristics(Note1)(Note2)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, I_D=15A, V_{GS}=10V, R_G=3.3Ω	-	7.5	-	nS
Turn-on Rise Time	t_r		-	14.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35.2	-	nS
Turn-Off Fall Time	t_f		-	9.6	-	nS
Total Gate Charge	Q_g	V_{DS}=15V, I_{DS}=20A, V_{GS}=4.5V	-	11.1	-	nC
Gate-Source Charge	Q_{gs}		-	1.85	-	nC
Gate-Drain Charge	Q_{gd}		-	6.8	-	nC
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,F=1MHz	-	2.5	-	Ω
Drain-Source Diode Characteristics						
Coninuous Current	I_S	V_G=V_D=0V, Force Current	-	-	80	A
Pulsed Source Current(Note1)	I_{SM}		-	-	320	A
Forward Voltage(Note1)	V_{SD}	I_S=1A,V_{GS}=0V,	-	-	1	V

Note 1. The data tested by pulsed , pulse width ≦ 300μs , duty cycle ≦ 2%.
Note 2. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Continuous Drain Current vs T_C

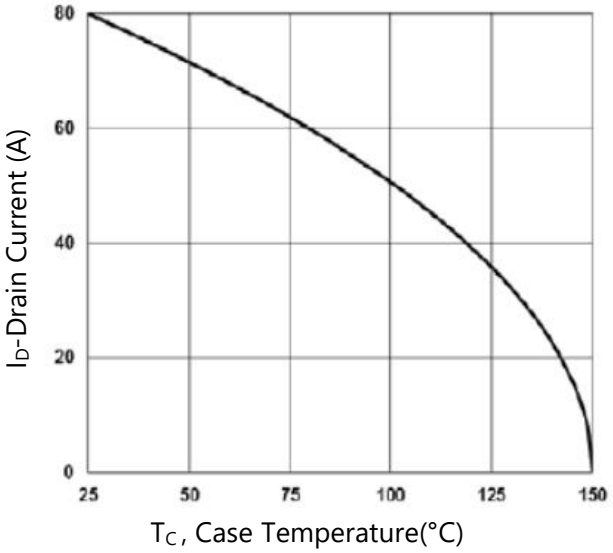


Figure 2. Normalized R_{DSON} vs T_J

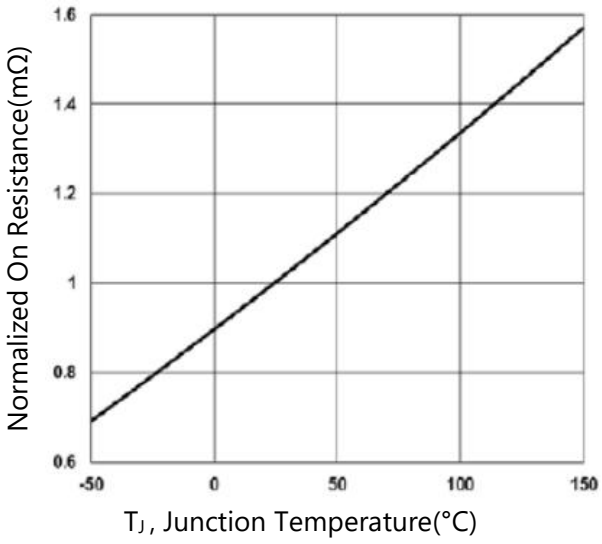


Figure 3. Normalized V_{th} vs T_J

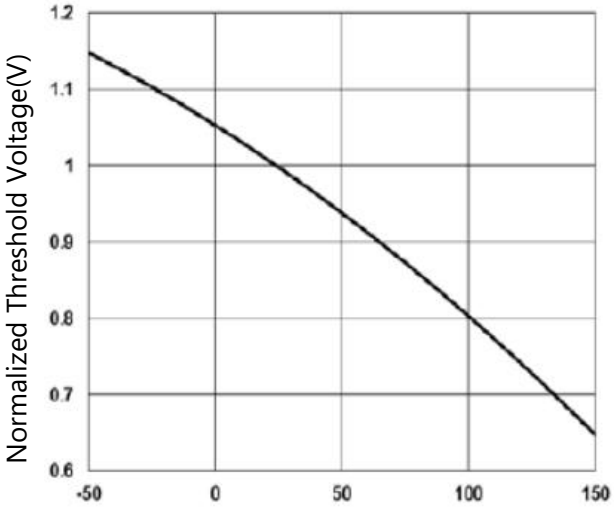
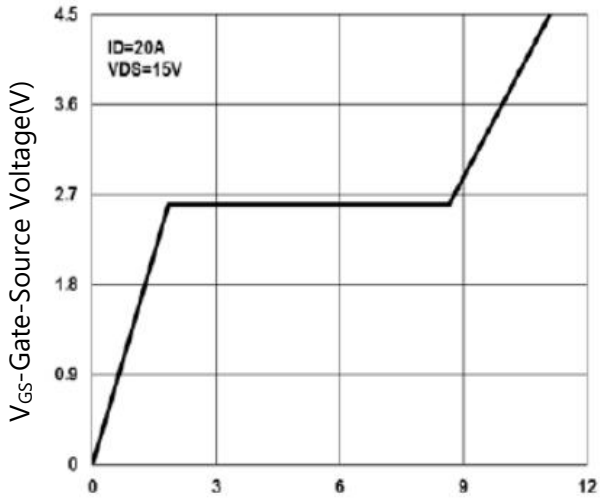


Figure 4. Gate Charge Waveform



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 5. Normalized Transient Impedance

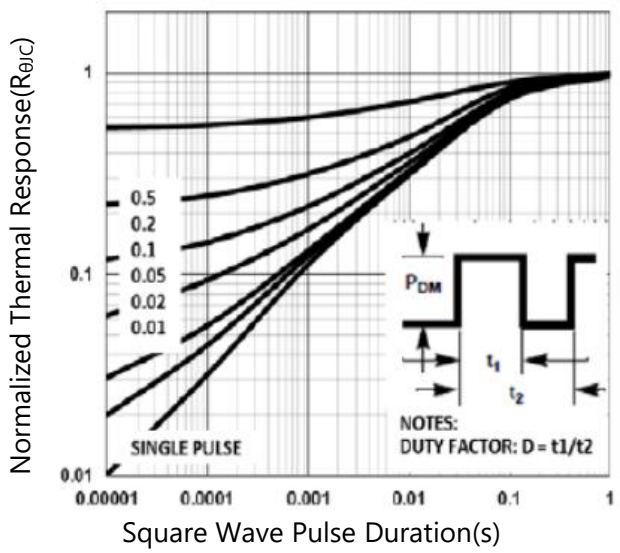


Figure 6. Maximum Safe Operation Area

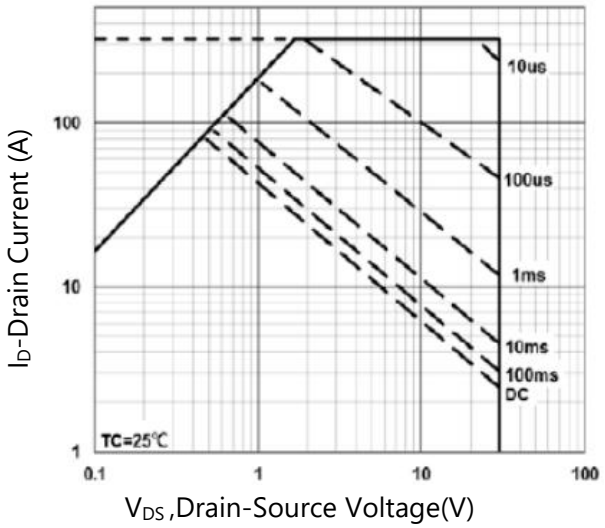


Figure 7. Switch Time Waveform

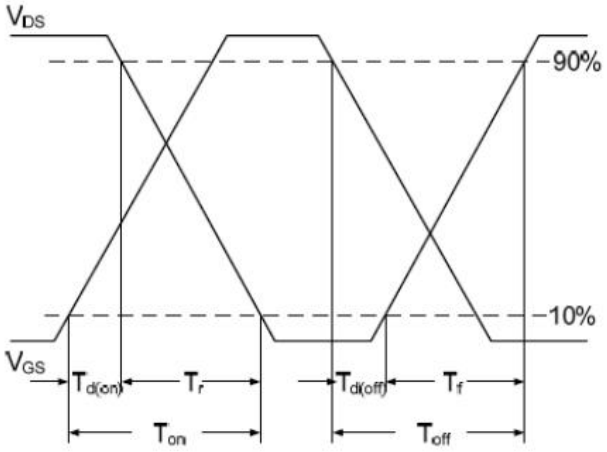
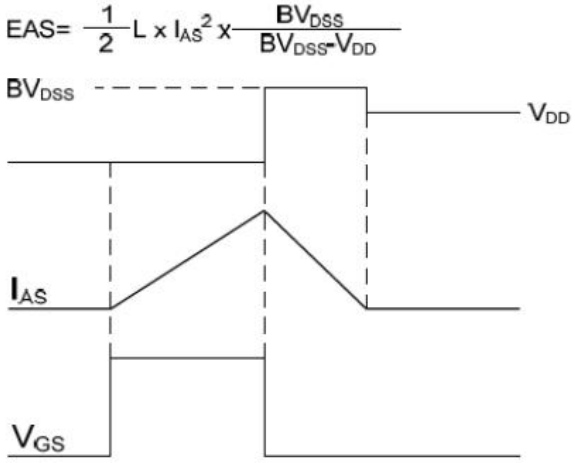
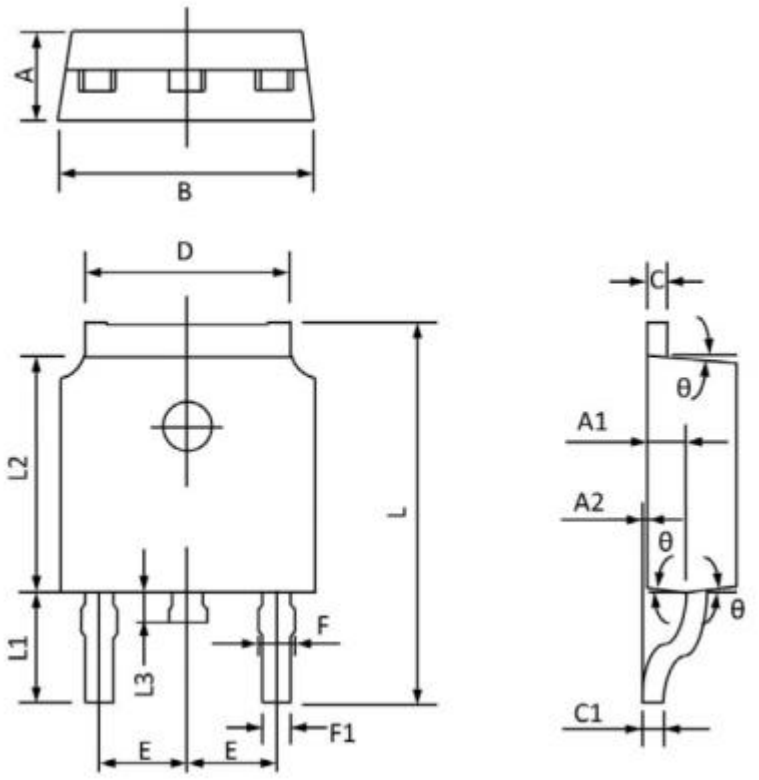


Figure 8. EAS Waveform



PACKAGE INFORMATION

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	0.910	1.110	0.036	0.044
A2	0.000	0.150	0.000	0.006
B	6.400	6.800	0.252	0.268
C	0.450	0.580	0.018	0.023
C1	0.450	0.580	0.018	0.023
D	5.100	5.500	0.201	0.217
E	2.186	2.386	0.086	0.094
F	0.600	0.940	0.024	0.037
F1	0.500	0.860	0.020	0.034
L	9.400	10.400	0.370	0.409
L1	2.400	3.000	0.094	0.118
L2	5.400	6.200	0.213	0.244
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°