



P-Channel Enhancement Mode Power MOSFET **MX40P08**



DESCRIPTION

The MX40P08 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -4.5V. This device is suitable for use as a wide variety of applications.



GENERAL FEATURES

- $V_{DS} = -40V$, $I_D = -8A$
 $R_{DS(ON)}(Typ.) = 21m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)}(Typ.) = 16m\Omega$ @ $V_{GS} = -10V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

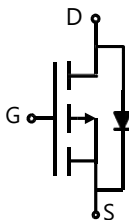


APPLICATION

- DC-DC converter
- Load switch
- Power management



PINOUT



Schematic diagram

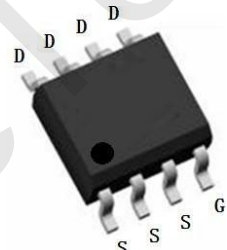
Product Code

XXXXXX

Lot No.

X X X X

Marking and pin Assignment



SOP-8 top view



ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MX40P08	-55°C to 150°C	SOP-8	2500



ABSOLUTE MAXIMUM RATINGS($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous($T_C = 25^\circ C$)	I_D	-8	A
Drain Current-Continuous($T_C = 100^\circ C$)		-5	
Pulsed Drain Current ^(Note1)	I_{DM}	-32	A
Maximum Power Dissipation($T_C = 25^\circ C$)	P_D	3	W
Maximum Power Dissipation($T_C = 100^\circ C$)		1.2	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	42	$^\circ C/W$
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Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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On/Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.1	-1.7	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-5A$	-	21	31	m Ω
		$V_{GS}=-10V, I_D=-8A$	-	16	21	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-5A$	15	-	-	S

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V, F=1.0MHz$	-	2050	-	pF
Output Capacitance	C_{oss}		-	260	-	pF
Reverse Transfer Capacitance	C_{rss}		-	150	-	pF

Switching Characteristics

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-20V, R_L=-1.6\Omega, V_{GS}=-10V, R_{GEN}=3\Omega$	-	10	-	nS
Turn-on Rise Time	t_r		-	24	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	40	-	nS
Turn-Off Fall Time	t_f		-	9	-	nS
Total Gate Charge	Q_g	$V_{DS}=-20V, I_D=-8A, V_{GS}=-10V$	-	45	-	nC
Gate-Source Charge	Q_{gs}		-	6	-	nC
Gate-Drain Charge	Q_{gd}		-	11	-	nC

Drain-Source Diode Characteristics

Source-Drain Current(Body Diode)	I_{SD}		-	-	-8	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

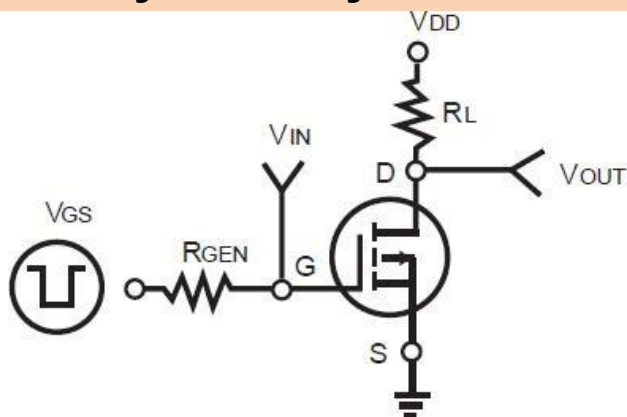


Figure 2. Switching Waveform

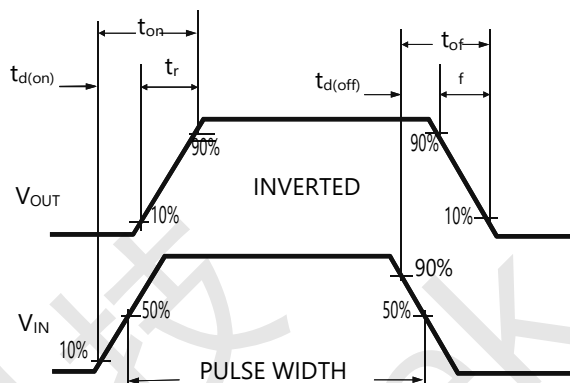


Figure 3. Power Dissipation

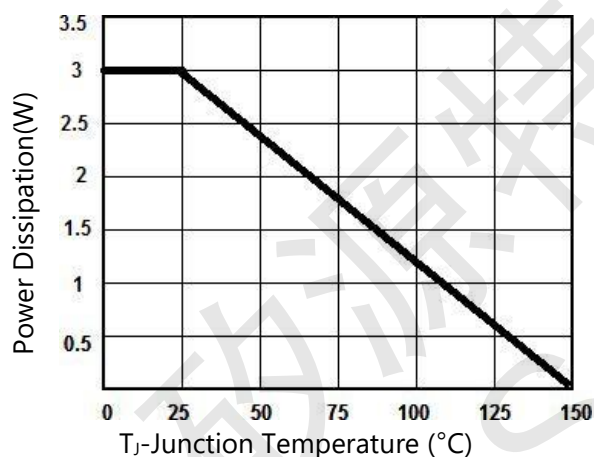


Figure 4. Drain Current

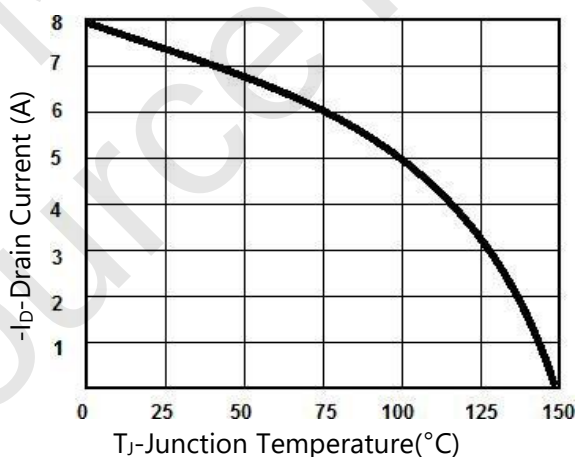


Figure 5. Output Characteristics

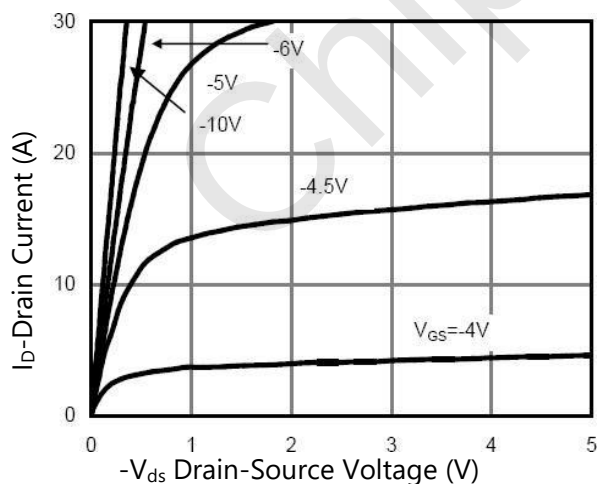
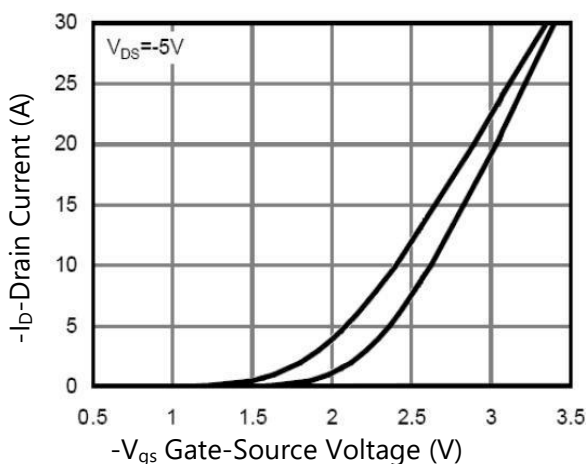


Figure 6. Transfer Characteristics





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Capacitance

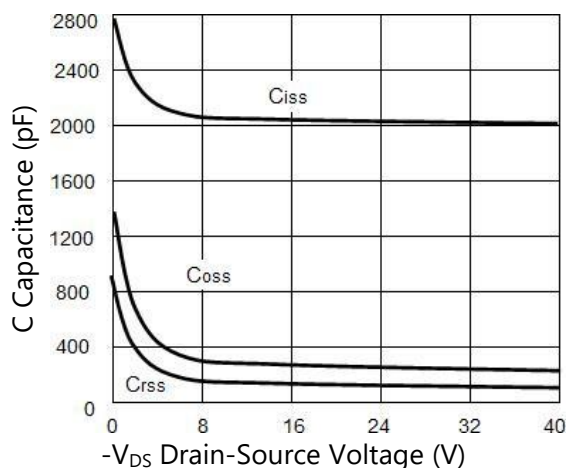


Figure 8. R_{DS(ON)} vs Junction Temperature

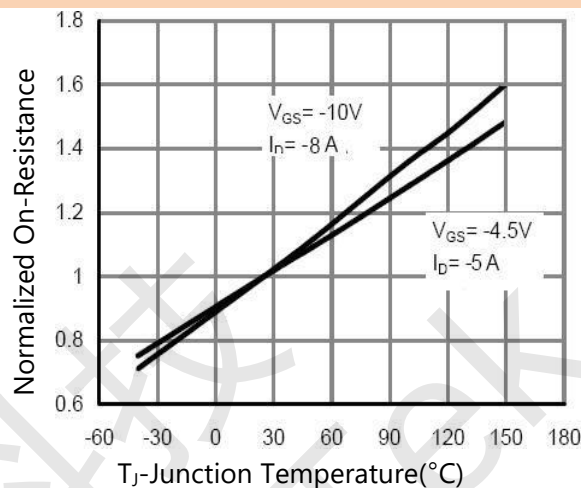


Figure 9. V_{GS(th)} vs Junction Temperature

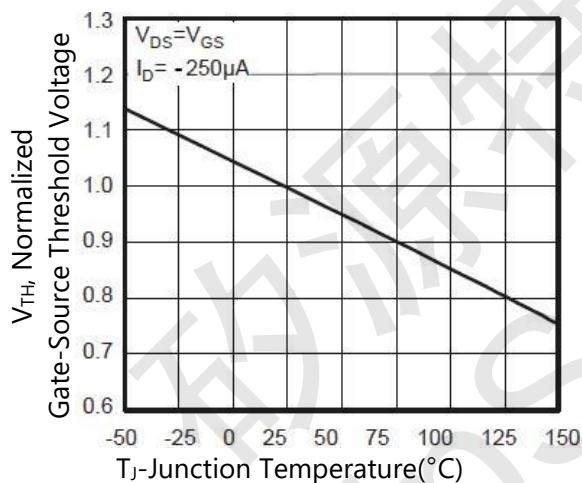
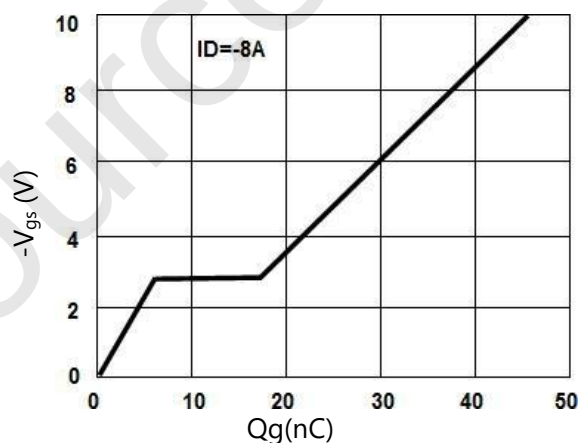


Figure 10. Gate Charge





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 11. Safe Operation Area

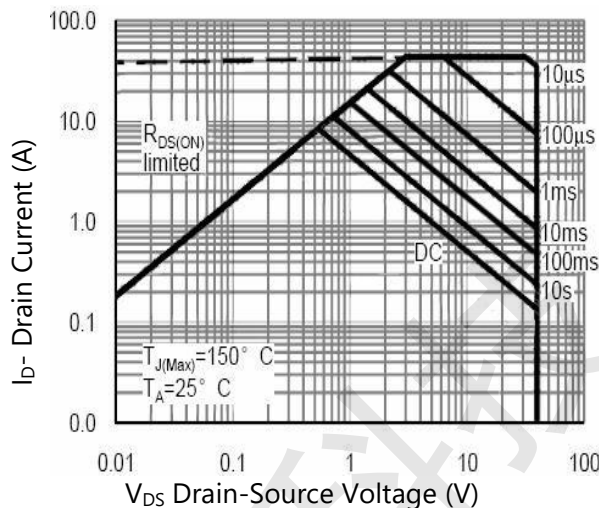
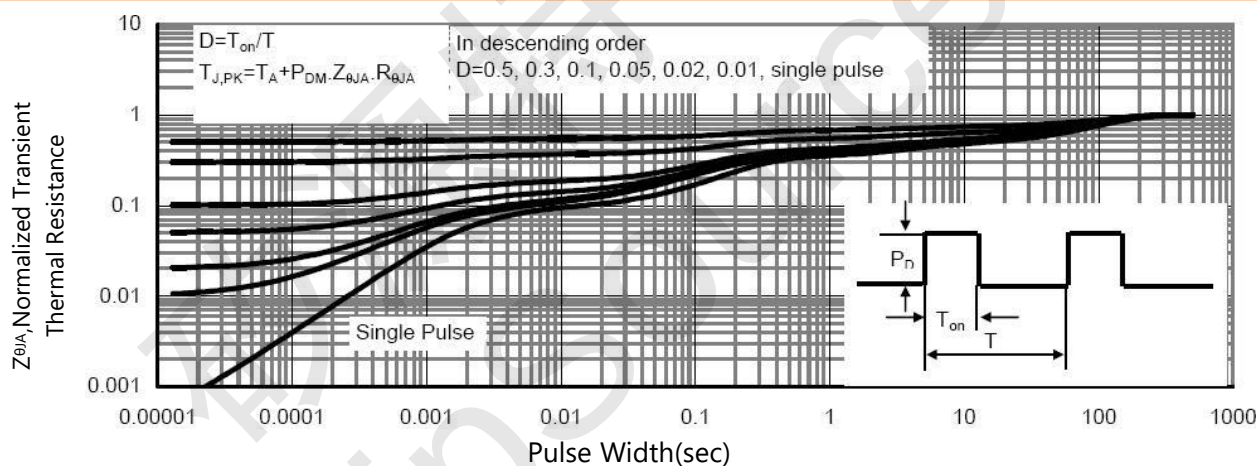


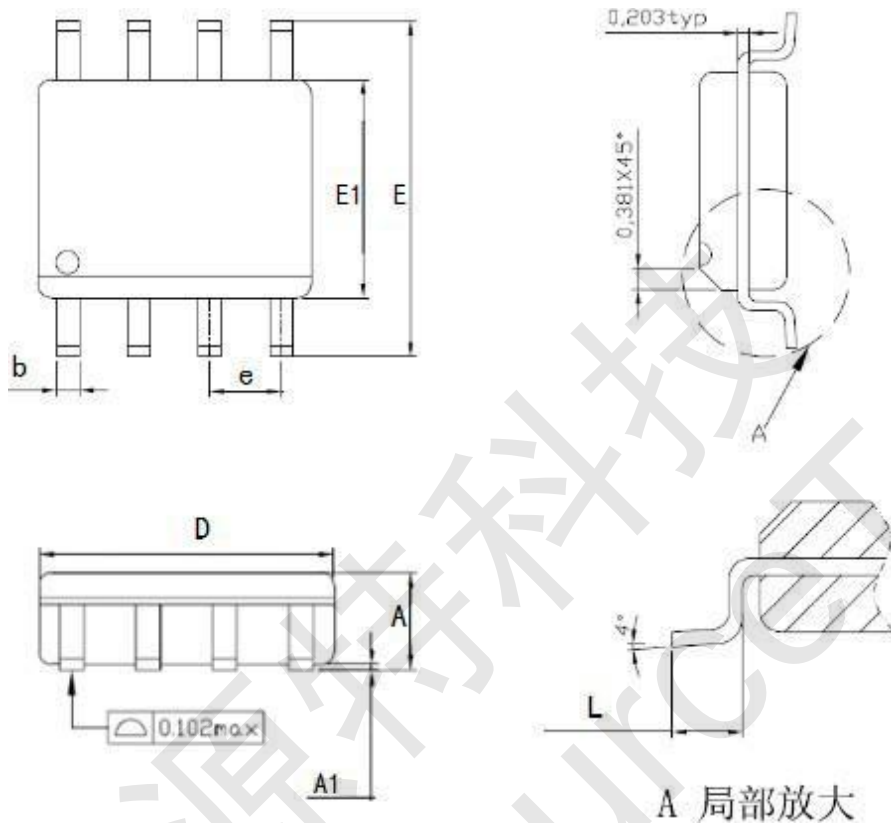
Figure 12. Normalized Maximum Transient Thermal Impedance





PACKAGE INFORMATION

SOT-8



Symbol	Dimensions InMillimeters		
	Min.	Typ.	Max.
A	1.350	1.550	1.750
A1	0.100	0.150	0.200
b	0.346	0.406	0.466
D	4.800	4.890	4.980
E	5.750	6.000	6.250
E1	3.810	3.900	3.990
e	1.27 TYP.		
L	0.406	0.838	1.270