

## 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.

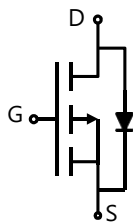
## GENERAL FEATURES

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

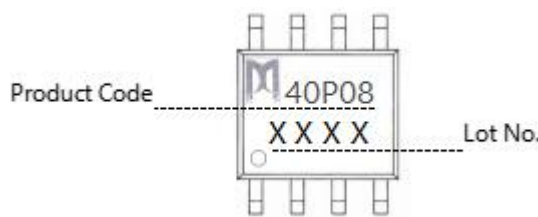
## APPLICATION

- DC-DC converter
- Load switch
- Power management

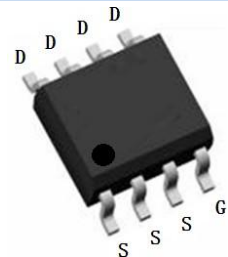
## PINOUT



Schematic diagram



Marking and pin Assignment



SOP-8 top view

## ORDERING INFORMATION

Part Number	Storage Temperature	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	$V_{GS}$	$\pm 20$	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 <sup>(Note1)</sup>	$I_{DM}$	-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	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	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 $\Omega$
		$V_{GS}=-10V, I_D=-8A$	-	16	21	m $\Omega$
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**

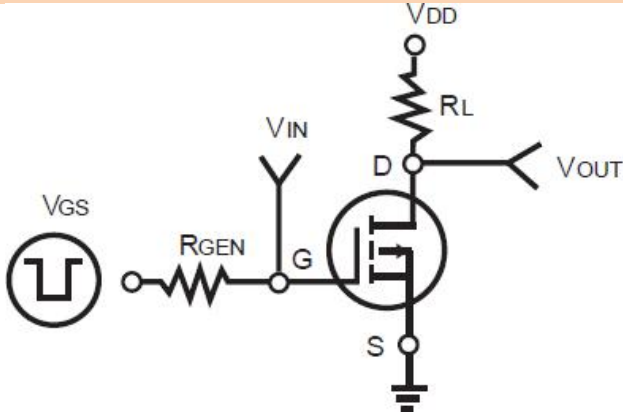
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-20V, R_L=-1.6\Omega, V_{GS}=-10V, R_{GEN}=3\Omega$	-	10	-	nS
Turn-on Rise Time	$t_r$		-	24	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	40	-	nS
Turn-Off Fall Time	$t_f$		-	9	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-20V, I_D=-8A, V_{GS}=-10V$	-	45	-	nC
Gate-Source Charge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

**Drain-Source Diode Characteristics**

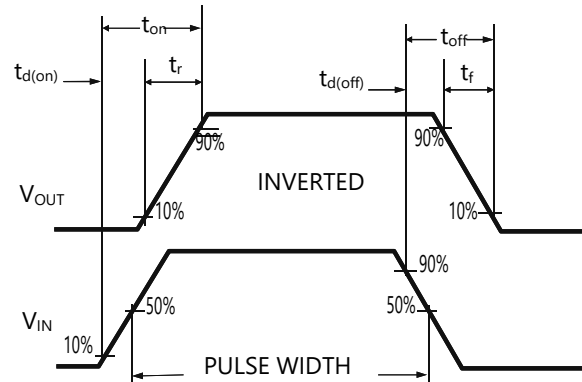
Source-Drain Current(Body Diode)	$I_{SD}$		-	-	-8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

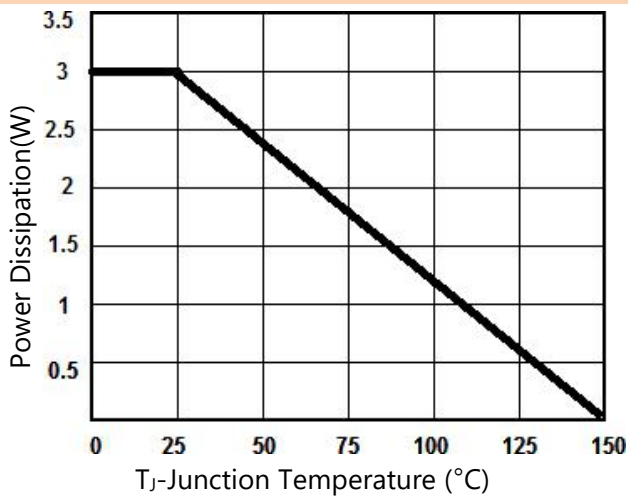
**Figure 1. Switching Test Circuit**



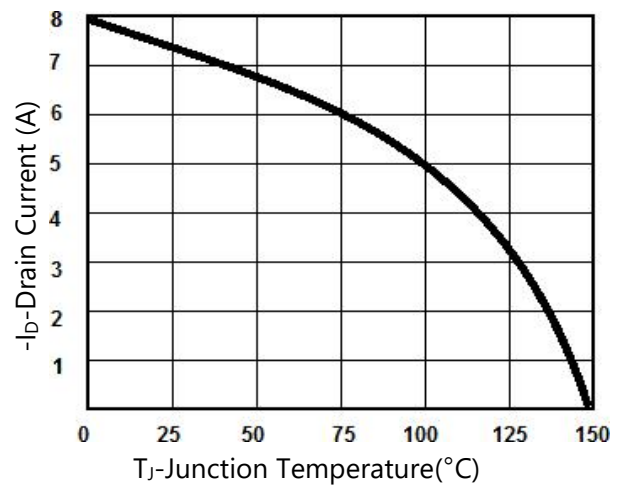
**Figure 2. Switching Waveform**



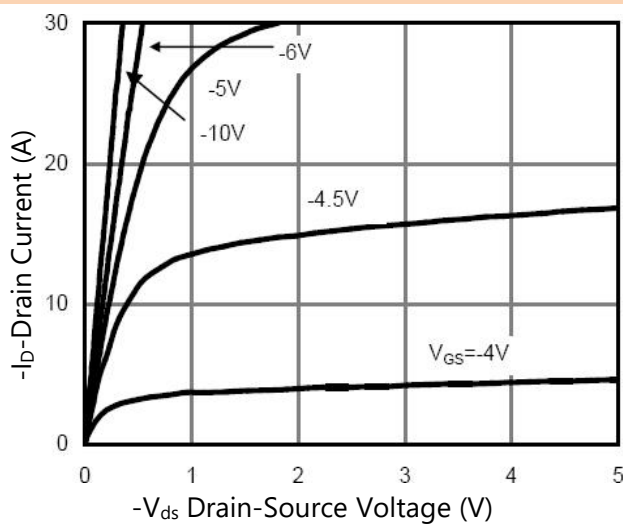
**Figure 3. Power Dissipation**



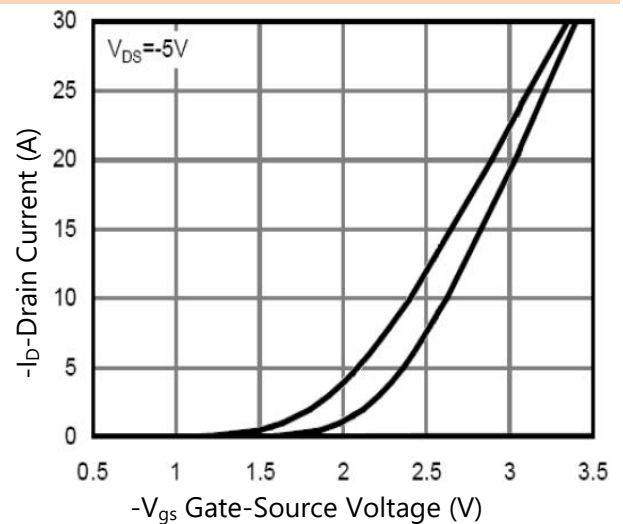
**Figure 4. Drain Current**



**Figure 5. Output Characteristics**



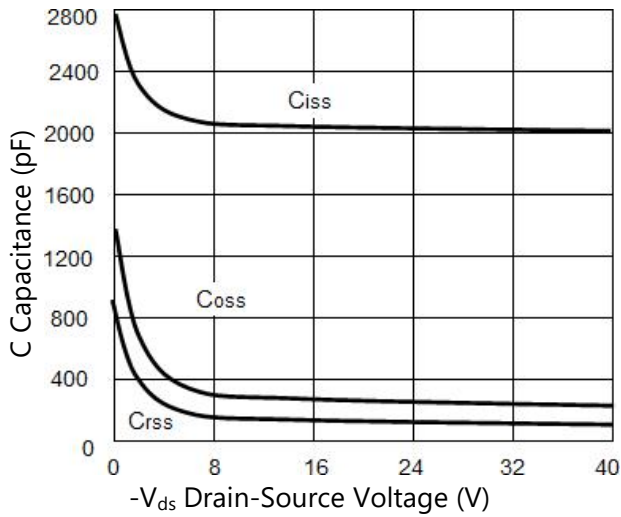
**Figure 6. Transfer Characteristics**



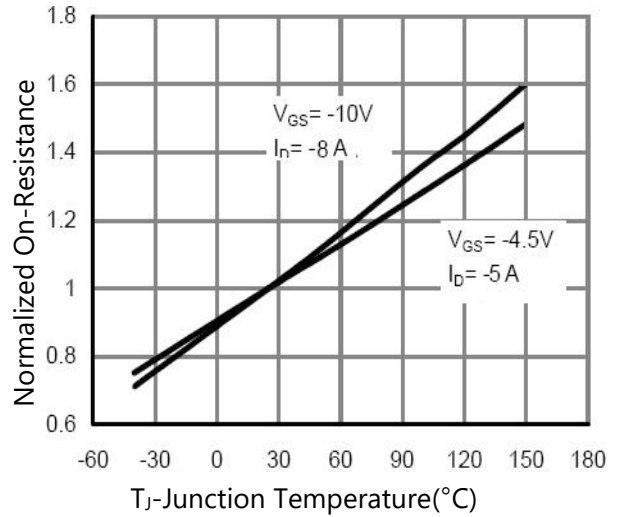


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

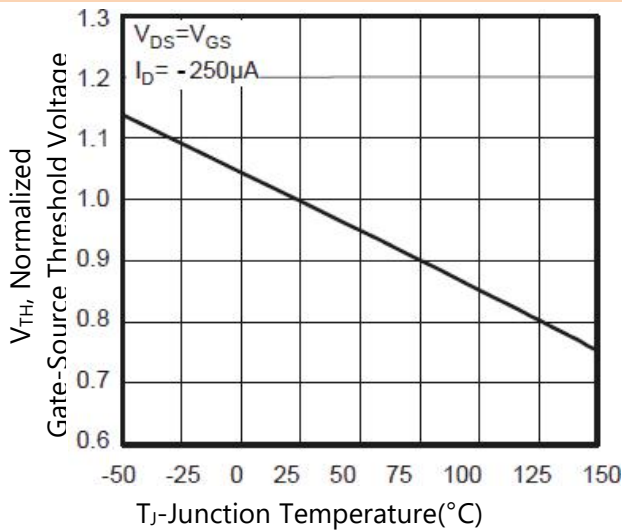
**Figure 7. Capacitance**



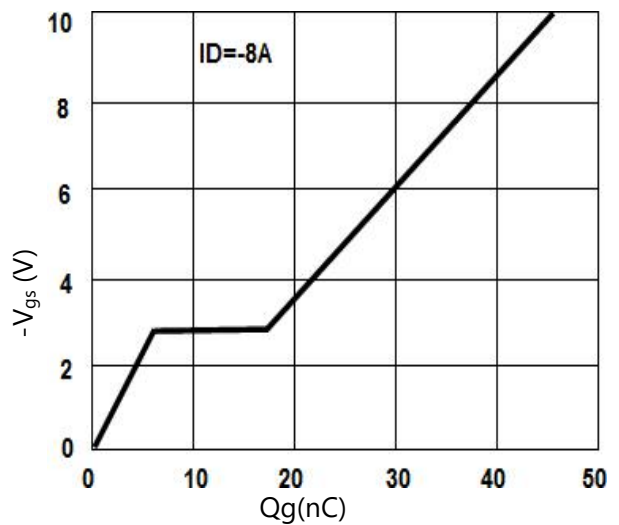
**Figure 8.  $R_{DS(ON)}$  vs Junction Temperature**



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

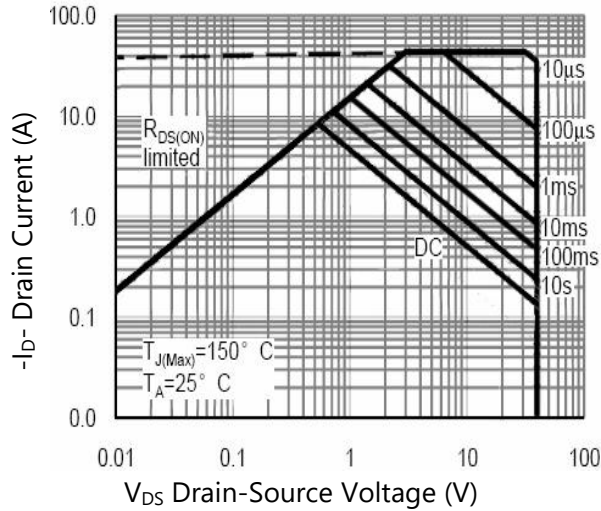


**Figure 10. Gate Charge**

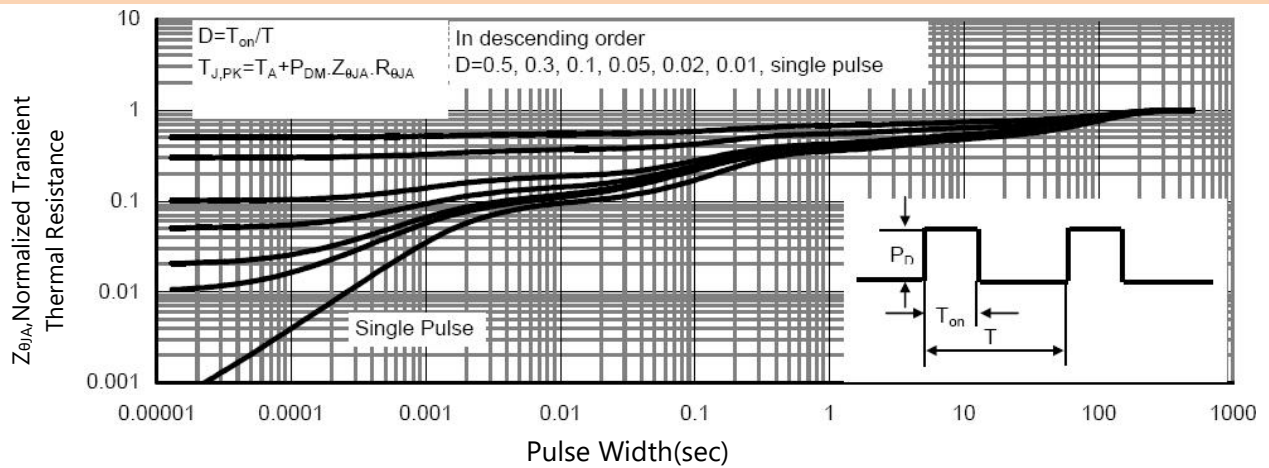


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

**Figure 11. Safe Operation Area**

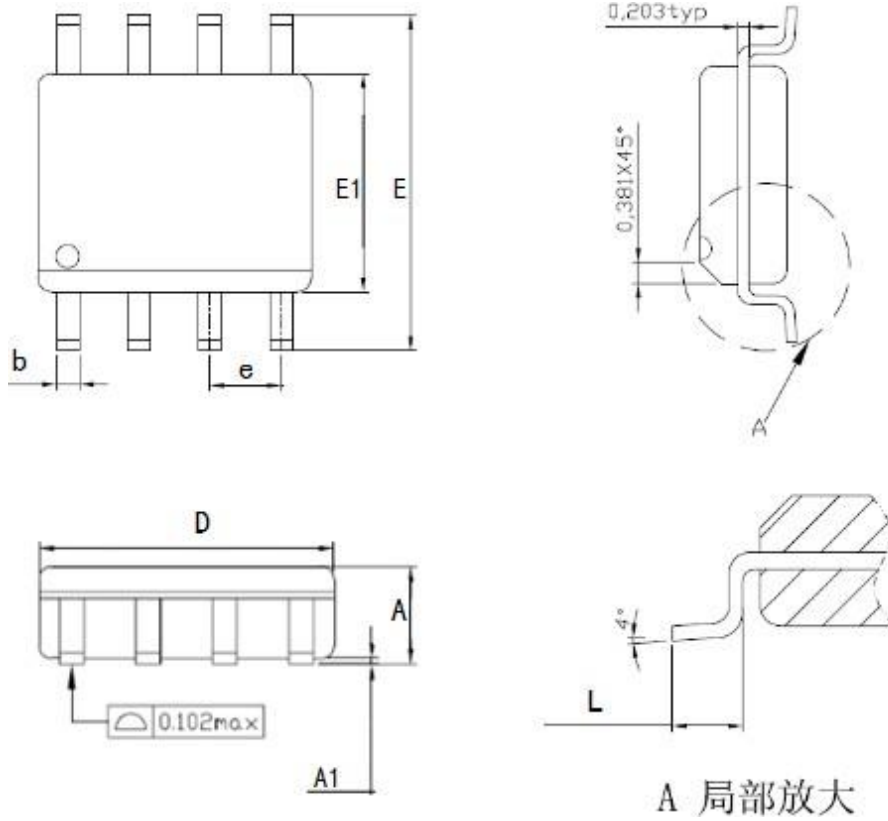


**Figure 12. Normalized Maximum Transient Thermal Impedance**



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