

DESCRIPTION

The MX4407AL uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

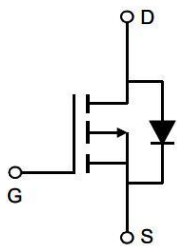
GENERAL FEATURES

- $V_{DS}=-30V$, $I_D=-12A$
 $R_{DS(ON)}(Typ.)=7m\Omega$ @ $V_{GS}=-10V$
 $R_{DS(ON)}(Typ.)=11m\Omega$ @ $V_{GS}=-4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

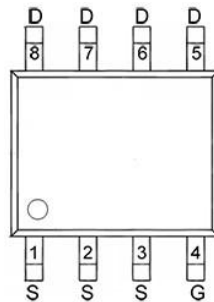
APPLICATION

- PWM applications
- Load switch
- Power management

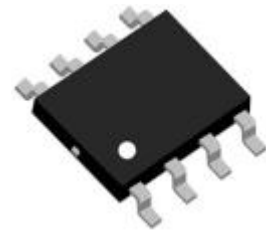
PINOUT



Schematic diagram



Pin Assignment



SOP-8 top view

ORDER INFORMATION

Device	Storage Temperature	Package	Devices Per Reel
MX4407AL	-55°C to 150°C	SOP-8	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Drain Current-Continuous	I_D	-12	A
Drain Current-Pulsed ^(Note1)	I_{DM}	-48	A
Maximum Power Dissipation	P_D	3	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICE

Thermal Resistance,Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	41.7	°C/W
--	-----------------	------	------

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.



ELECTRICAL CHARACTERISTICS($T_A=25^{\circ}\text{C}$ 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} =-28V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-10A	-	7	9	mΩ
		V _{GS} =-4.5V, I _D =-7A	-	11	14	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-10A	-	21	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1.0MHz	-	2600	-	pF
Output Capacitance	C _{oss}		-	370	-	pF
Reverse Transfer Capacitance	C _{rss}		-	340	-	pF
Switching Characteristics ^(Note4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, R _L =1Ω, V _{GS} =-10V, R _G =3Ω	-	11	-	nS
Turn-on Rise Time	t _r		-	6	-	nS
Turn-Off Delay Time	t _{d(off)}		-	28	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	5	-	nC
Gate-Drain Charge	Q _{gd}		-	10	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note3)	V _{SD}	V _{GS} =0V, I _S =-1A	-	-	-1.2	V
Diode Forward Current ^(Note2)	I _S		-	-	-3	A

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Note 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 4. Guaranteed by design, not subject to production



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

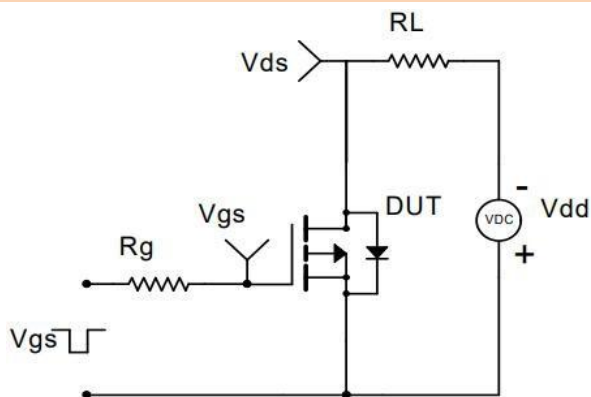


Figure 2. Switching Waveform

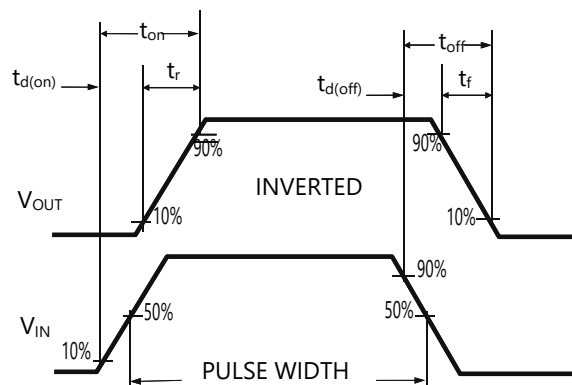


Figure 3. Power Dissipation

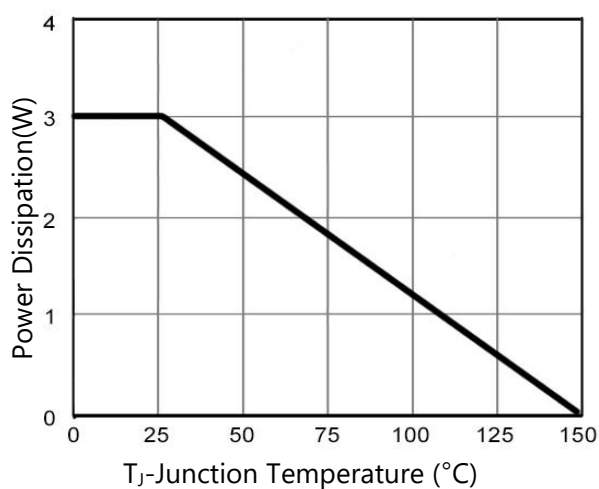


Figure 4. Drain Current

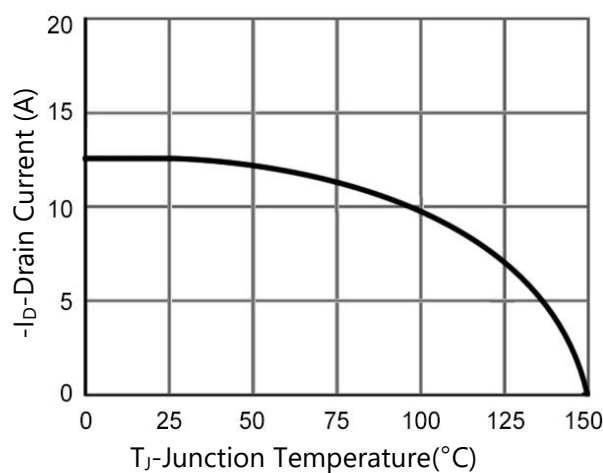


Figure 5. Output Characteristics

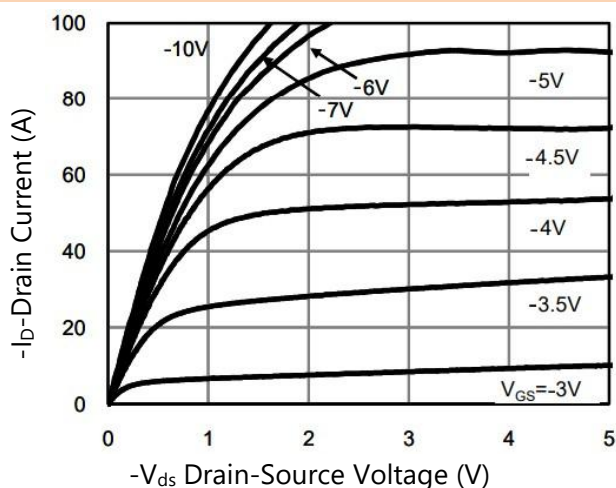
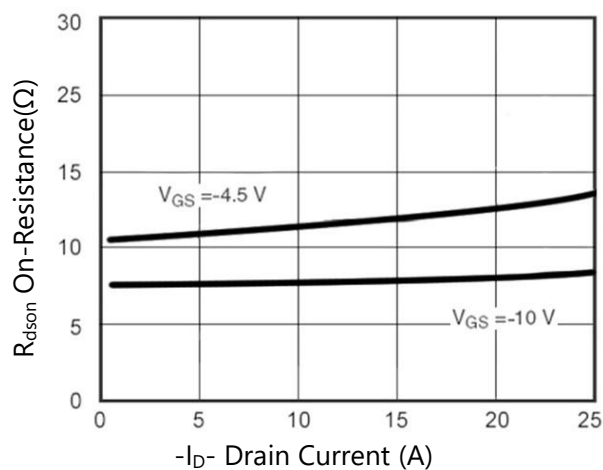


Figure 6. R_{dson} vs Drain Current





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

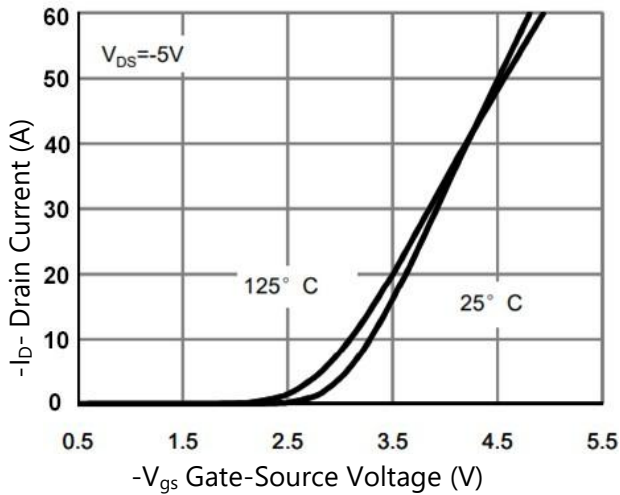


Figure 8. $R_{ds(on)}$ vs Junction Temperature

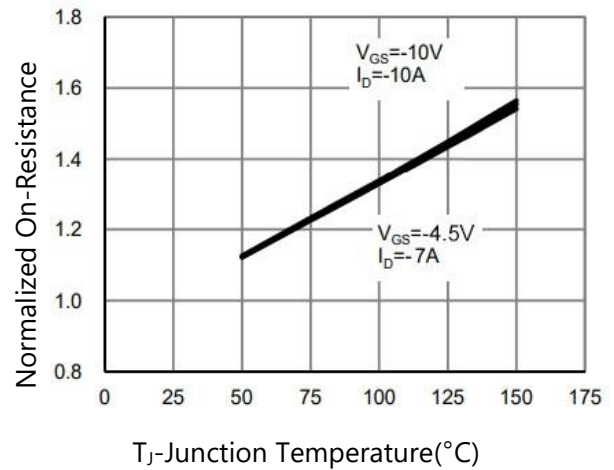


Figure 9. $R_{ds(on)}$ vs V_{GS}

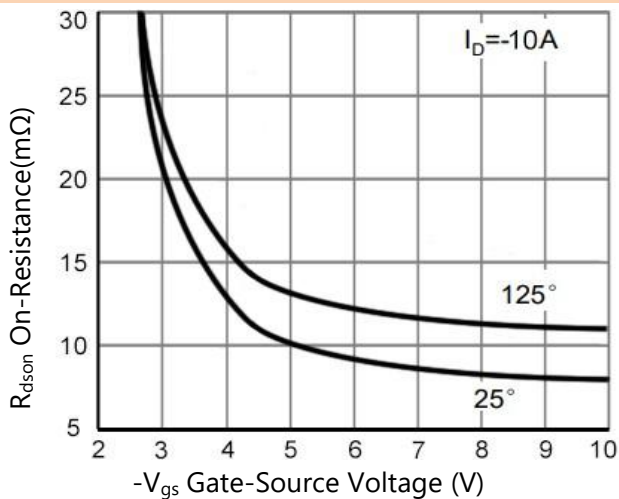


Figure 10. Capacitance vs V_{ds}

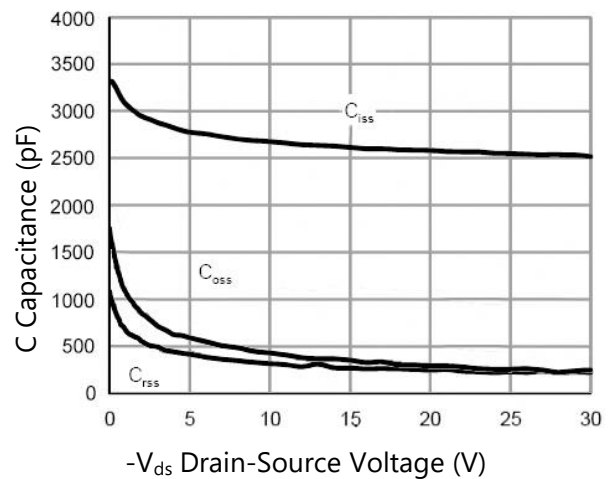


Figure 11. Gate Charge

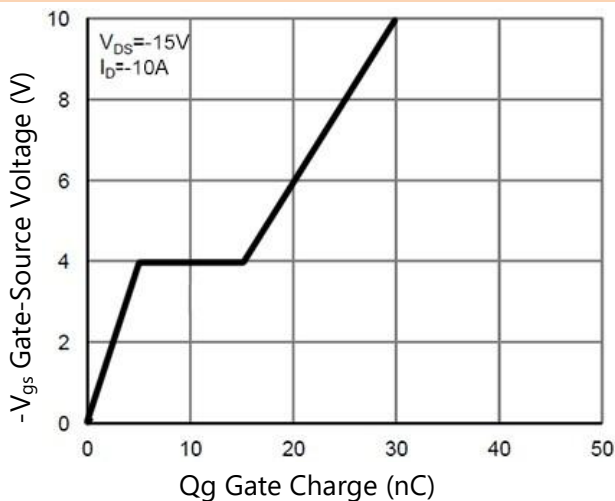
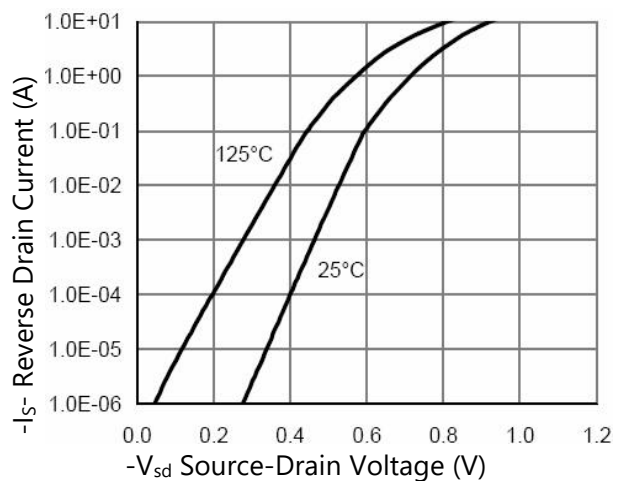


Figure 12. Source- Drain Diode Forward





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 13. Safe Operation Area

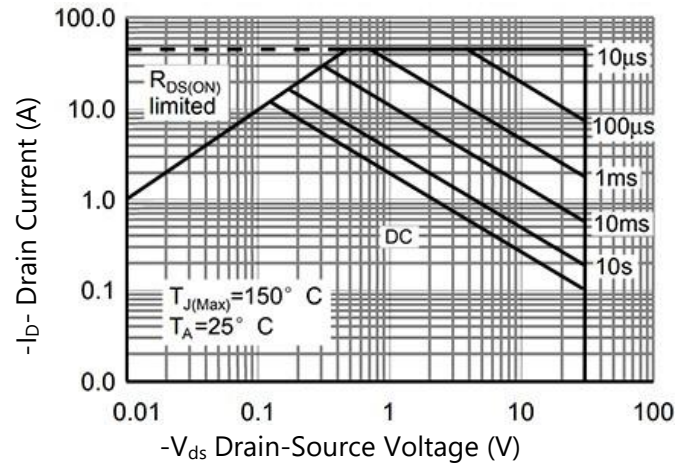
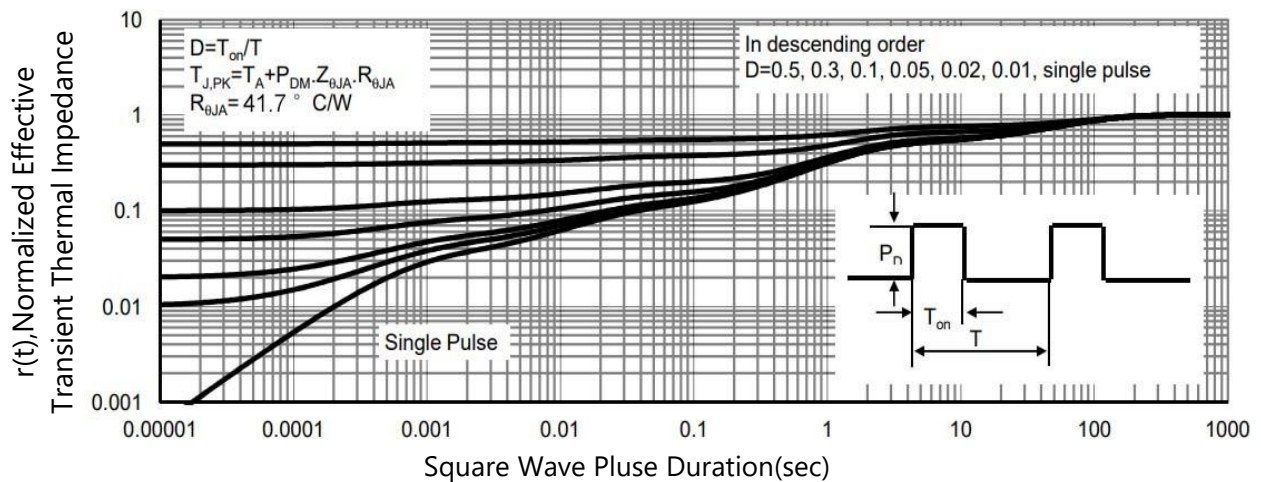
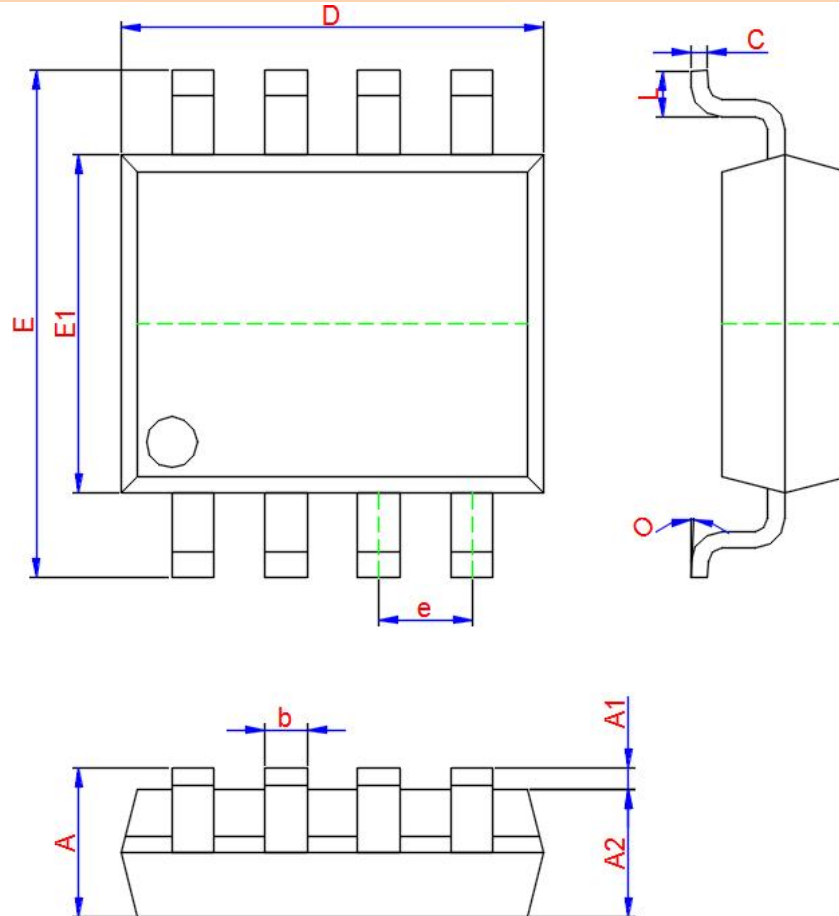


Figure 14. Normalized Maximum Transient Thermal Impedance



PACKAGE INFORMATION

SOP-8



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.700	4.900	5.100
e	1.270 TYP.		
E	5.800	6.000	6.200
E1	3.750	3.900	4.050
L	0.400	0.835	1.270
O	0°	4°	8°