

## DESCRIPTION

The MX3407 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , This device is suitable for use as a load switch or in PWM applications.

## GENERAL FEATURES

- $V_{DS}=-30V$ ,  $I_D=-4.3A$   
 $R_{DS(ON)}(Typ.)=60m\Omega$  @  $V_{GS}=-4.5V$   
 $R_{DS(ON)}(Typ.)=38m\Omega$  @  $V_{GS}=-10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

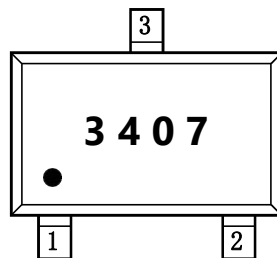
## APPLICATION

- PWM applications
- Load switch
- Power management

## PINOUT



Schematic diagram



Marking and Pin Assignment



SOT-23-3 top view

## ORDERING INFORMATION

Part Number	Marking	Storage Temperature	Package	Devices Per Reel
MX3407	3407	-55°C to 150°C	SOT-23-3	3000

## 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	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-4.3	A
Drain Current-Pulsed <sup>(Note1)</sup>	$I_{DM}$	-20	A
Drain-Source Diode Forward Current	$I_S$	-1.25	A
Maximum Power Dissipation	$P_D$	1.5	W
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

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
-----------	--------	------------	-----	-----	-----	------

**Off Characteristics**

Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA

**On Characteristics** (Note3)

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.4	-1.6	-2.4	V
		$V_{GS}=-4.5V, I_D=-4A$	-	60	100	$m\Omega$
		$V_{GS}=-10V, I_D=-4.3A$	-	38	50	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-4.1A$	5.5	-	-	S

**Dynamic Characteristics** (Note4)

Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, F=1.0MHz$	-	700	-	$pF$
Output Capacitance	$C_{oss}$		-	120	-	$pF$
Reverse Transfer Capacitance	$C_{rss}$		-	75	-	$pF$

**Switching Characteristics** (Note4)

Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=3.6\Omega, V_{GS}=-10V, R_{GEN}=3\Omega$	-	9	-	nS
Turn-on Rise Time	$t_r$		-	5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	28	-	nS
Turn-Off Fall Time	$t_f$		-	13.5	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-4.2A, V_{GS}=-4.5V$	-	14	-	nC
Gate-Source Charge	$Q_{gs}$		-	3.1	-	nC
Gate-Drain Charge	$Q_{gd}$		-	3	-	nC

**Drain-Source Diode Characteristics**

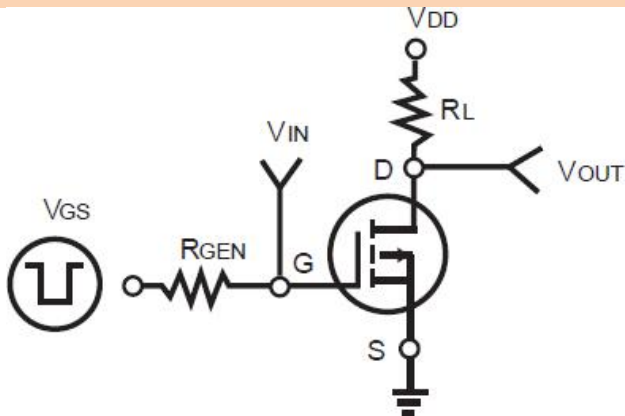
Diode Forward Voltage (Note3)	$V_{SD}$	$V_{GS}=0V, I_S=-4.2A$	-	-	-1.2	V
-------------------------------	----------	------------------------	---	---	------	---

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

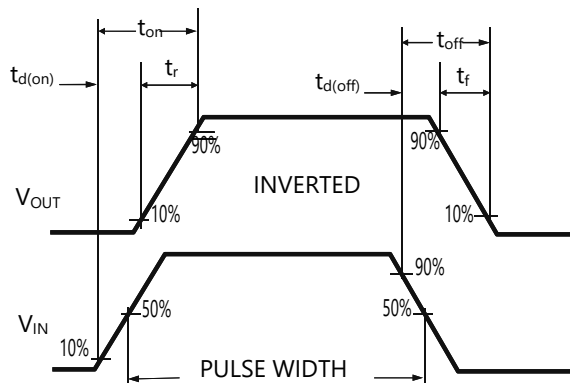
Note 4. Guaranteed by design, not subject to production

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

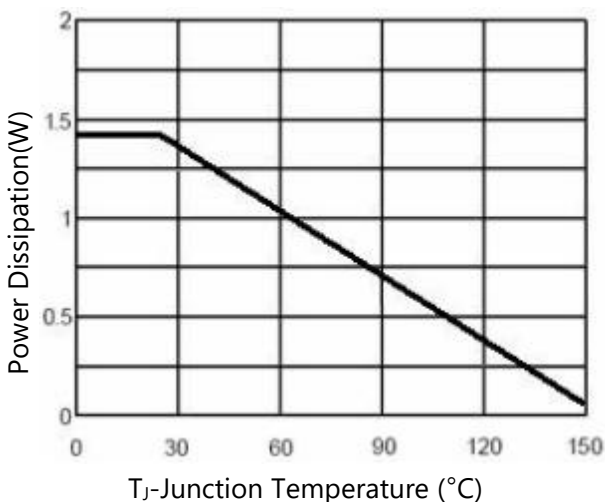
**Figure 1. Switching Test Circuit**



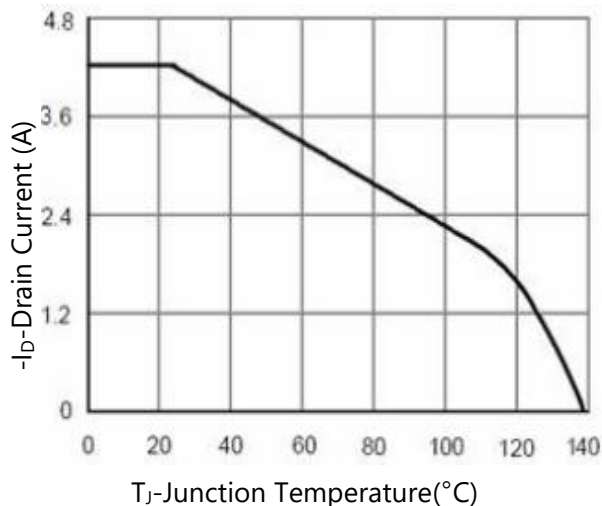
**Figure 2. Switching Waveform**



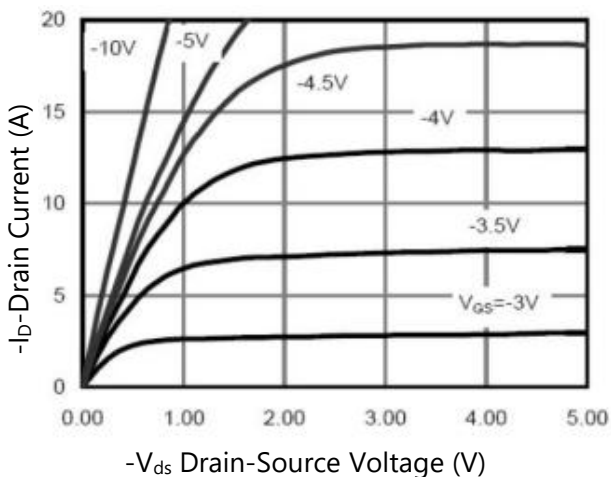
**Figure 3. Power Dissipation**



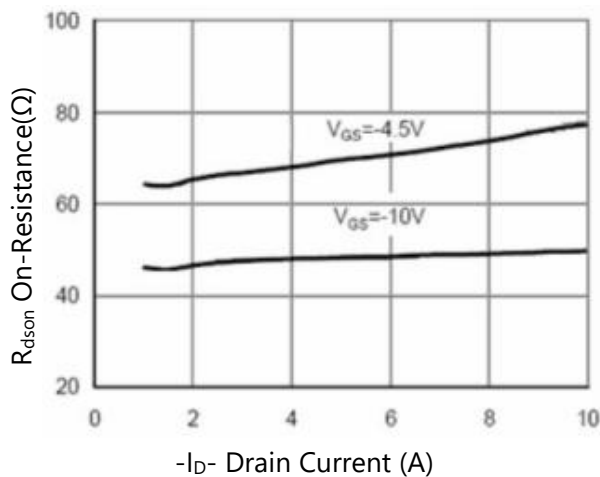
**Figure 4. Drain Current**



**Figure 5. Output Characteristics**



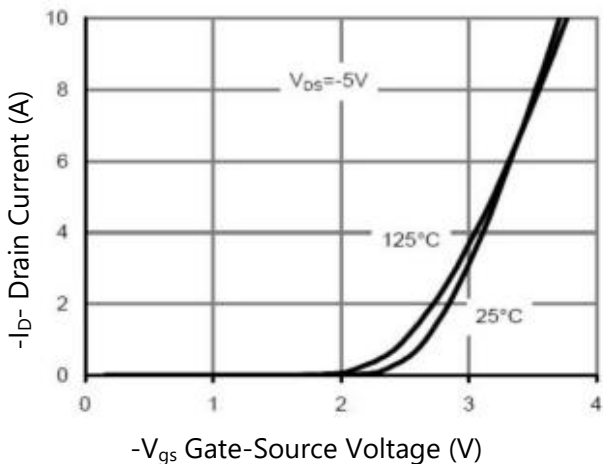
**Figure 6. Drain-Source On-Resistance**



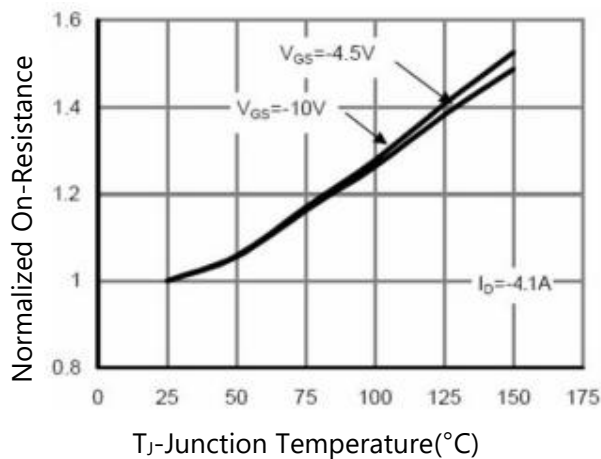


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

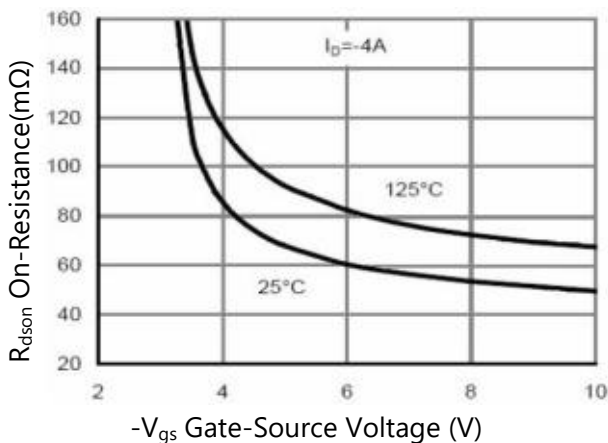
**Figure 7. Transfer Characteristics**



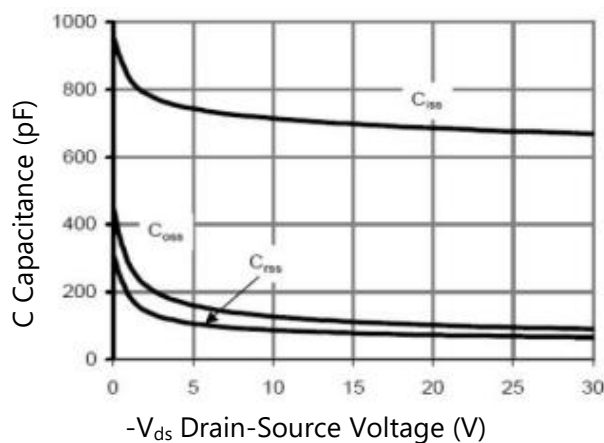
**Figure 8. Drain-Source On-Resistance**



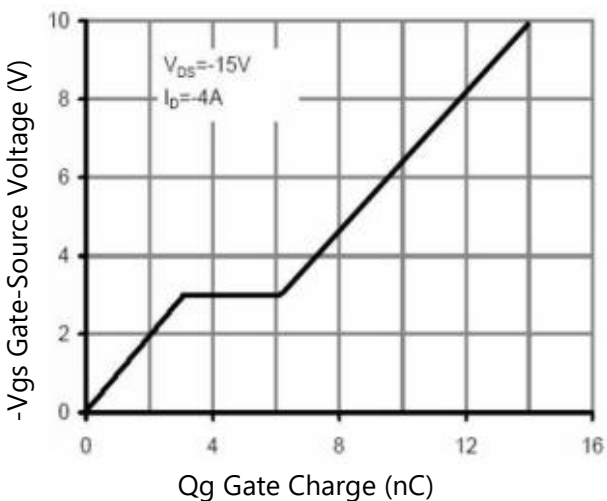
**Figure 9.  $R_{dson}$  vs  $V_{GS}$**



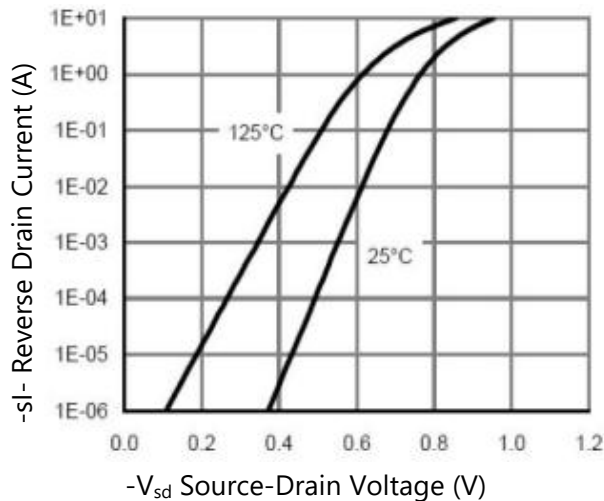
**Figure 10. Capacitance vs  $V_{ds}$**



**Figure 11. Gate Charge**



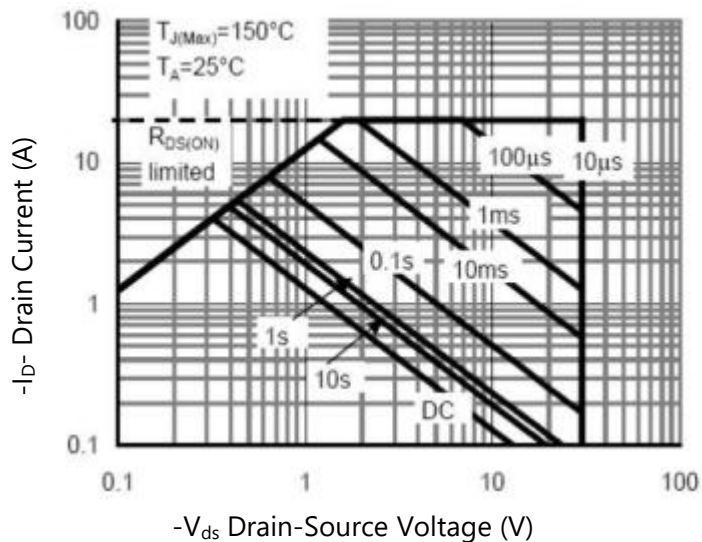
**Figure 12. Source- Drain Diode Forward**



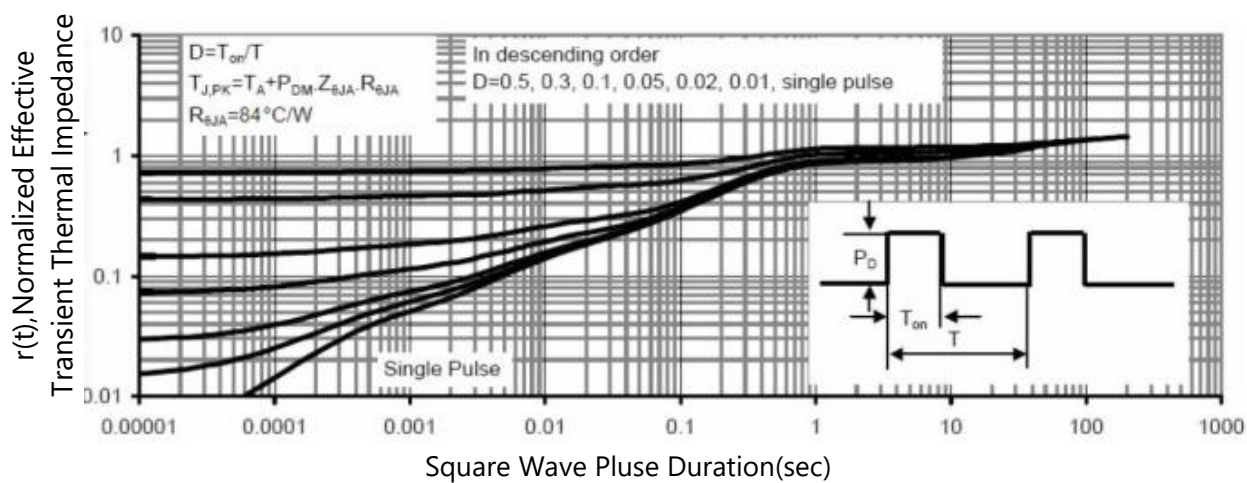


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

**Figure 11. Safe Operation Area**

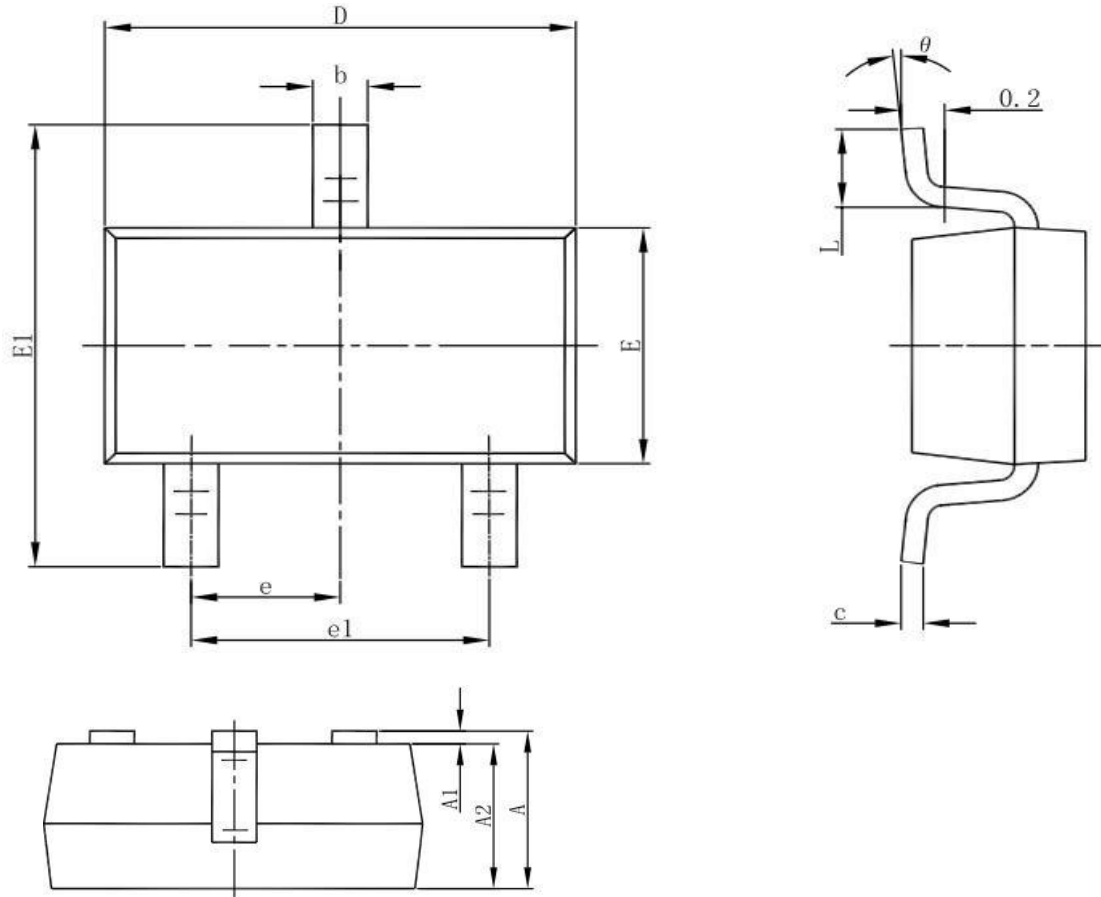


**Figure 12. Normalized Maximum Transient Thermal Impedance**



**PACKAGE INFORMATION**

SOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°