MJ P-Channel Enhancement Mode Power MOSFET

Description

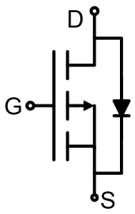
The MJ3407 uses advanced trench technology to provide excellent $R_{DS(ON)}$, This device is suitable for use as a load switch or in PWM applications.

General Features

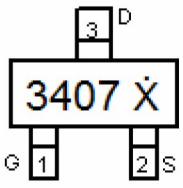
- V_{DS}=-30V,I_D=-4.6A
  $R_{DS(ON)}$<95mΩ @ V_{GS}=-4.5V
  $R_{DS(ON)}$<65mΩ @ V_{GS}=-10V
- High power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment

SOT-23 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3407 X	MJ3407	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings (T_C =25 ℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{DS}	±20	V
Drain Current-Continuous	I_D	-4.6	A
Pulsed Drain Current (Note 1)	I_{DM}	-20	A
Maximum Power Dissipation	P_D	1.4	W
Operating Junction and Storage Temperature Range	T_J ,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	90	℃/W

Electrical Characteristics (T_A =25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} ,I_D=-250μA	-1.1	-1.5	-2.1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.6A	-	48	65	mΩ
		V_{GS}=-4.5V, I_D=-4A	-	60	95	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-4.6A	-	10	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	650	-	PF
Output Capacitance	C_{oss}		-	105	-	PF
Reverse Transfer Capacitance	C_{rss}		-	65	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, ,R_L=3.6Ω V_{GS}=-10V,R_{GEN}=3Ω	-	8.5	-	nS
Turn-on Rise Time	t_r		-	4.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	26	-	nS
Turn-Off Fall Time	t_f		-	12.5	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-4.6A, V_{GS}=-10V	-	12.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.8	-	nC
Gate-Drain Charge	Q_{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-4.6A	-	-	-1.2	V

Notes:

① Repetitive Rating: Pulse width limited by maximum junction temperature.
② Surface Mounted on FR4 Board, t ≤ 10 sec.
③ Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
④ Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

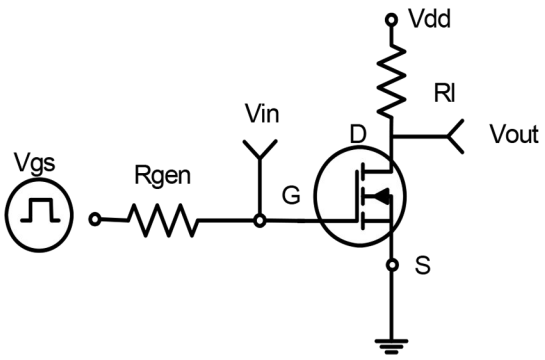


Figure 1 Switching Test Circuit

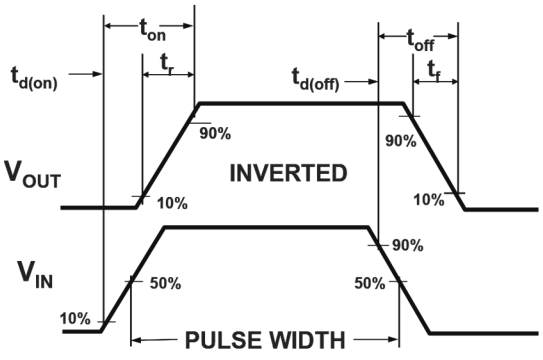


Figure 2 Switching Waveforms

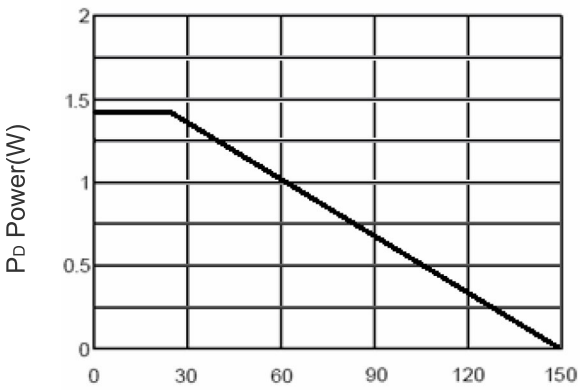


Figure 3 Power Dissipation

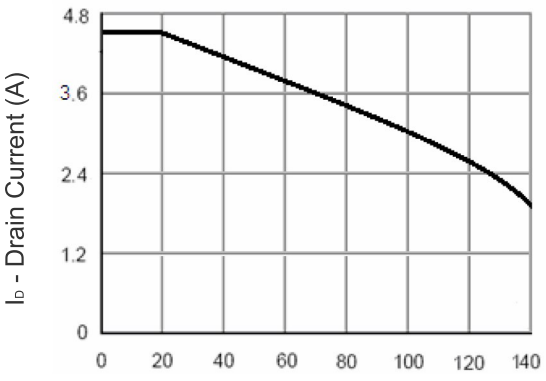


Figure 4 Drain Current

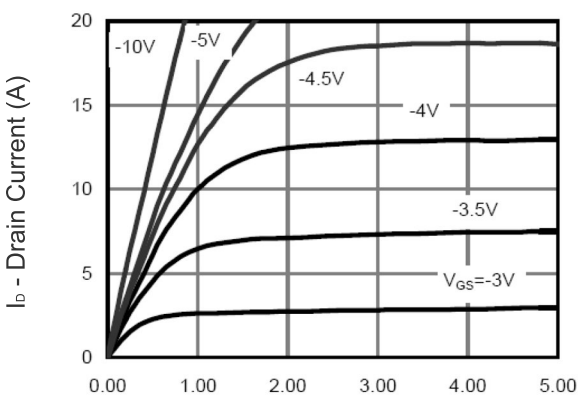


Figure 5 Output Characteristics

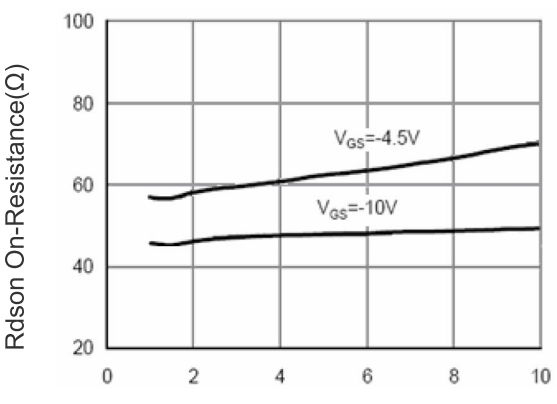


Figure 6 Drain-Source On-Resistance

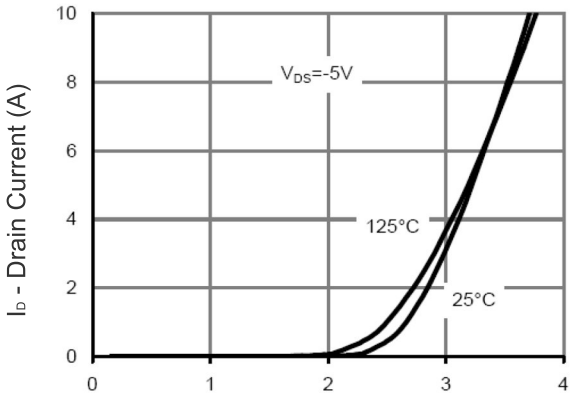


Figure 7 Transfer Characteristics

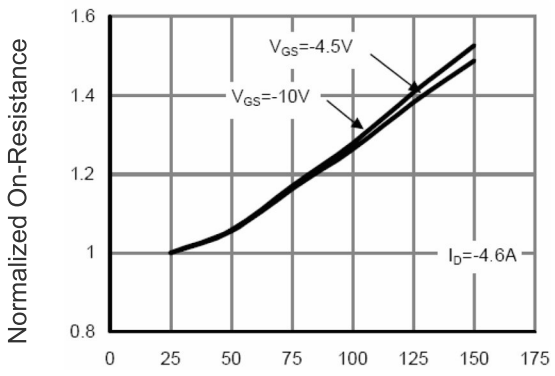


Figure 8 Drain-Source On-Resistance

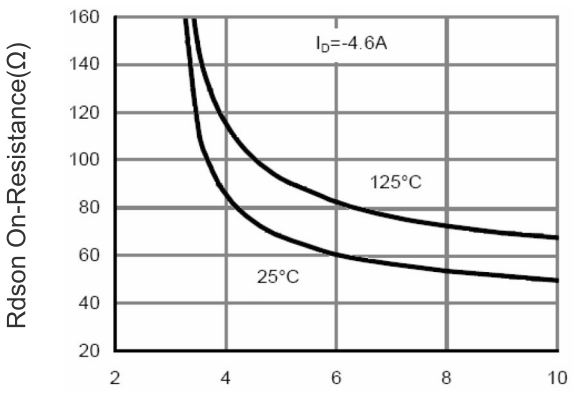


Figure 9 Rdson vs Vgs

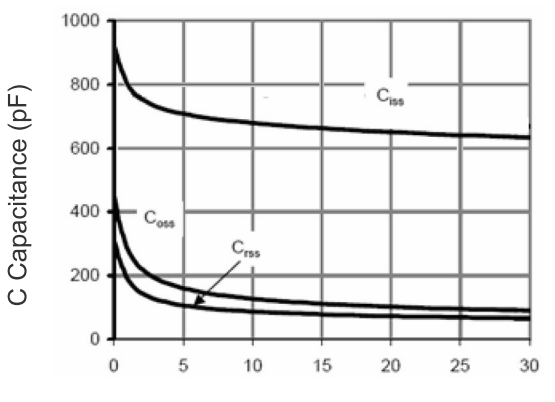


Figure 10 Capacitance vs Vds

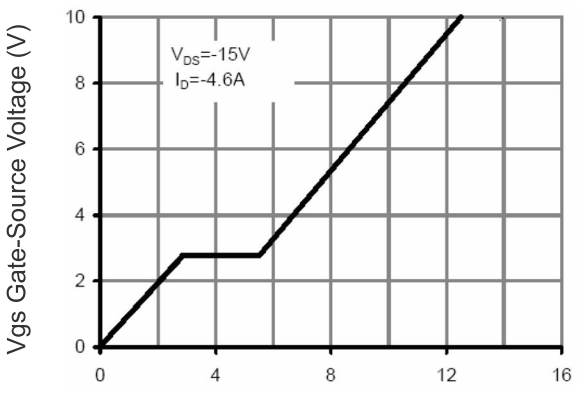


Figure 11 Gate Charge

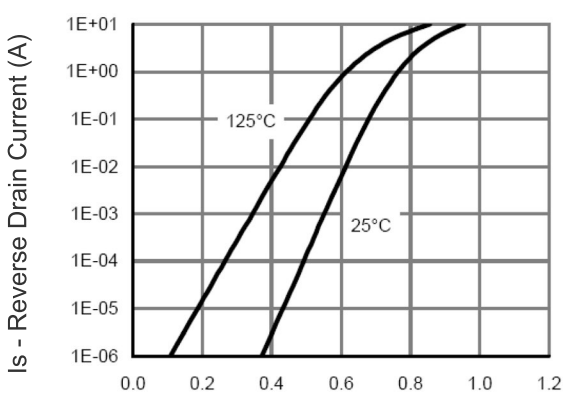


Figure 12 Source- Drain Diode Forward

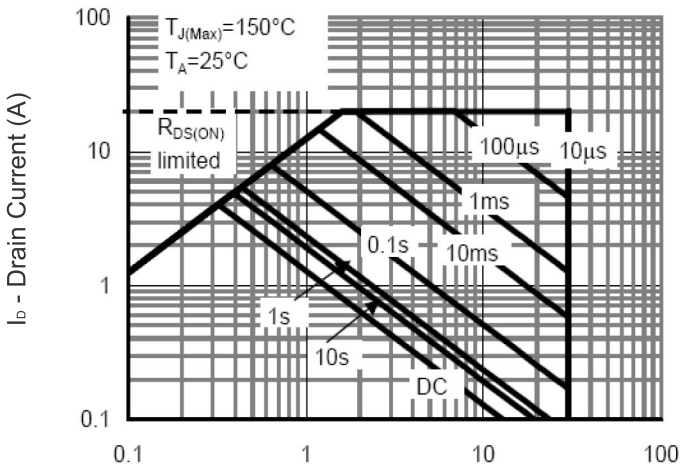


Figure 13 Safe Operation Area

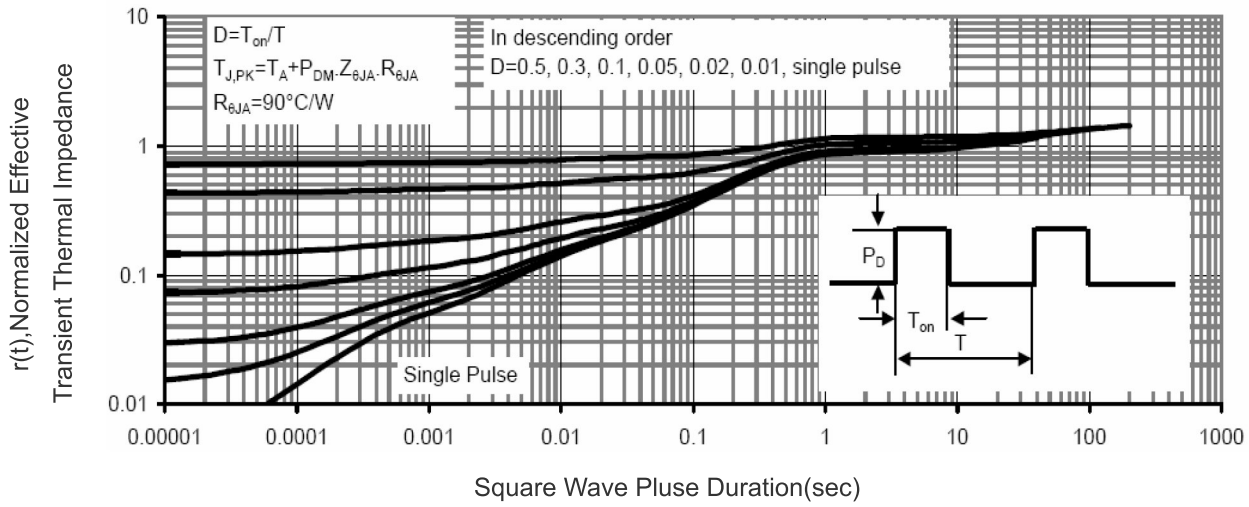
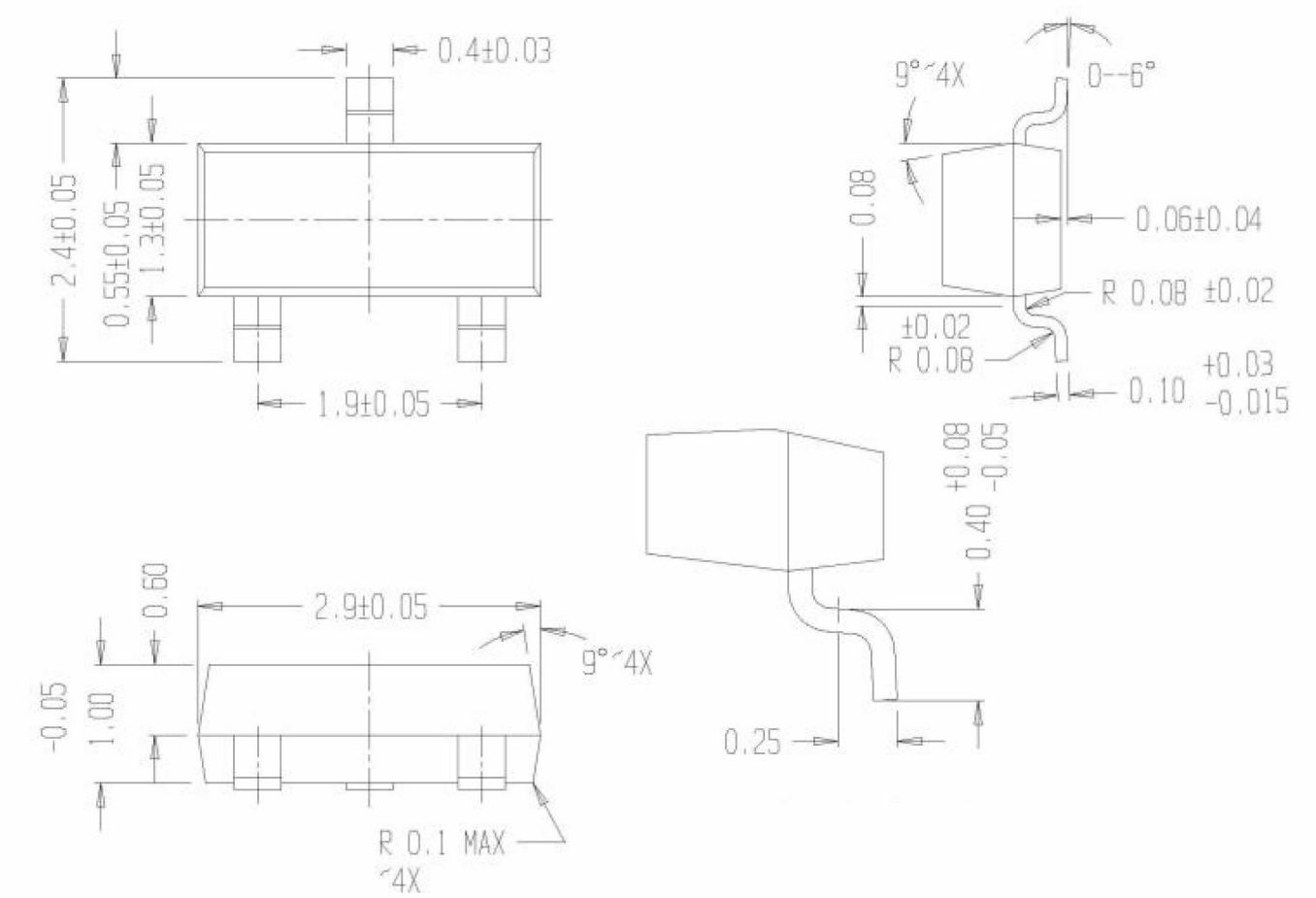
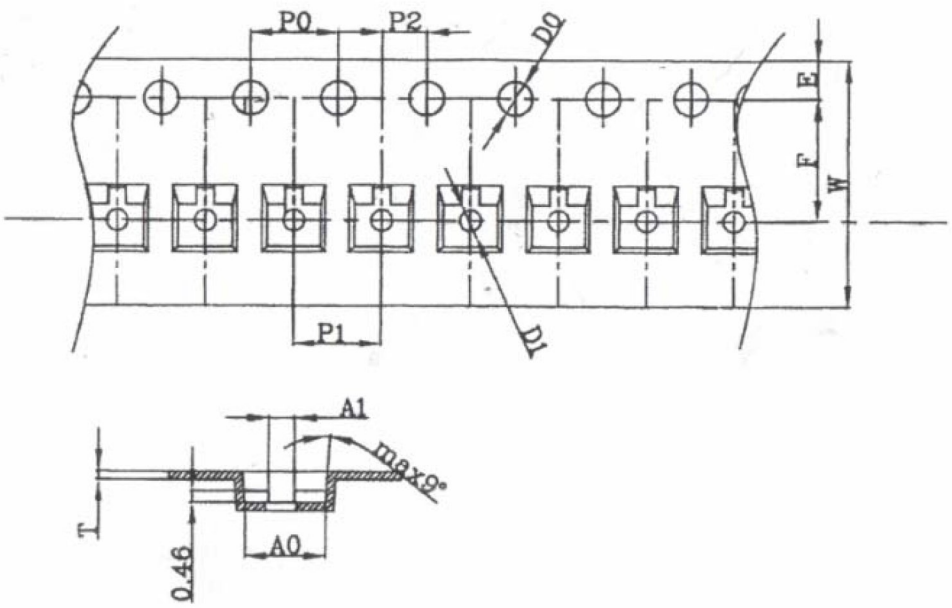


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Information





NOTE:
1. 材料：导电PC(Denka ECM3K, 0.20T)；
2. 10个链孔的累积公差不能超过0.2mm；
3. 250mm带子的扇形不得超过1mm；
4. 所有尺寸符合EIA-481-E的要求

SYMBOL	A0	A1	B0	B1	K0	P0	P1	P2
SPEC	3.15±0.10	0.99±0.2	2.77±0.10	2.06±0.10	1.22±0.10	4.00±0.10	4.00±0.10	2.00±0.05
SYMBOL	T	E	F	D0	D1	W		
SPEC	0.2±0.02	1.75±0.10	3.50±0.50	$1.55^{+0.1}_{0}$	$1.0^{+0.25}_{0}$	8.00±0.1		

Carrier Tape

PKG TYPE	Lead count	Tape Width	Reel Diameter	QTY/Reel	QTY/Outer Box	G.W.(kg)
SOT-23	3	8mm	7"	3000	180000	6.5

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