

Description

JMT N-channel Enhancement Mode Power MOSFET

Features

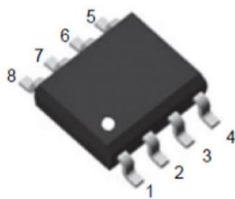
- 30V, 13A
 $R_{DS(ON)} < 9.6m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 16m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

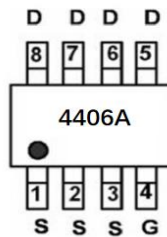
- Load Switch
- PWM Application
- Power Management



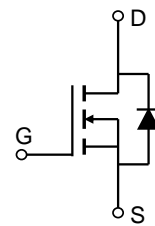
100% UIS TESTED!
100% ΔVds TESTED!



SOP-8 Top View



Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
4406A	JMTP4406A	TAPING	SOP-8	13"	4000	48000

Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ\text{C}$	13
		$T_A = 100^\circ\text{C}$	8
I_{DM}	Pulsed Drain Current ⁽¹⁾	52	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	36	mJ
P_D	Power Dissipation	$T_A = 25^\circ\text{C}$	1.6
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽³⁾	77	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$



Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.6	2.2	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 13A	-	7.4	9.6	mΩ
		V _{GS} = 4.5V, I _D = 10A	-	12.3	16.0	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz	-	1002	-	pF
C _{oss}	Output Capacitance		-	131	-	pF
C _{rss}	Reverse Transfer Capacitance		-	105	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DD} = 15V, I _D = 13A	-	20	-	nC
Q _{gs}	Gate Source Charge		-	4	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{GS} = 10V, V _{DD} = 15V I _D = 13A, R _{GEN} = 3Ω	-	6	-	ns
t _r	Turn-On Rise Time		-	19	-	ns
t _{d(off)}	Turn-Off Delay Time		-	22	-	ns
t _f	Turn-Off Fall Time		-	5	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	13	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	52	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 13A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 13A, di/dt = 100A/μs	-	8	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	2	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting T_J = 25°C, V_{DD} = 15V, V_G = 10V, R_G = 25ohm, L = 0.5mH, I_{AS} = 12A
 3. R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
 4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

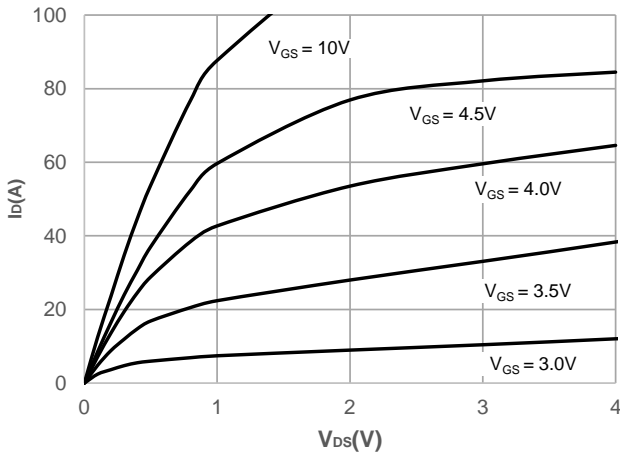


Figure 2: Typical Transfer Characteristics

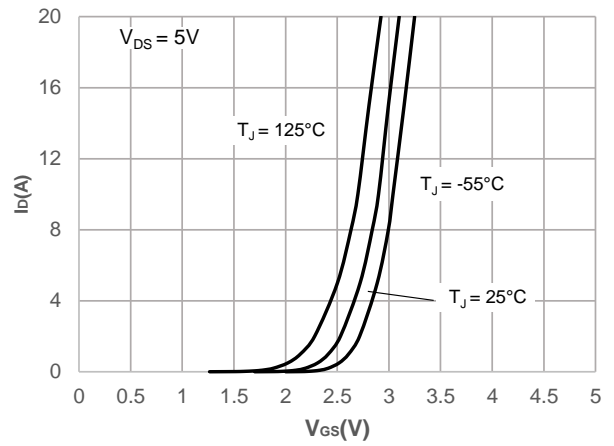


Figure 3: On-resistance vs. Drain Current

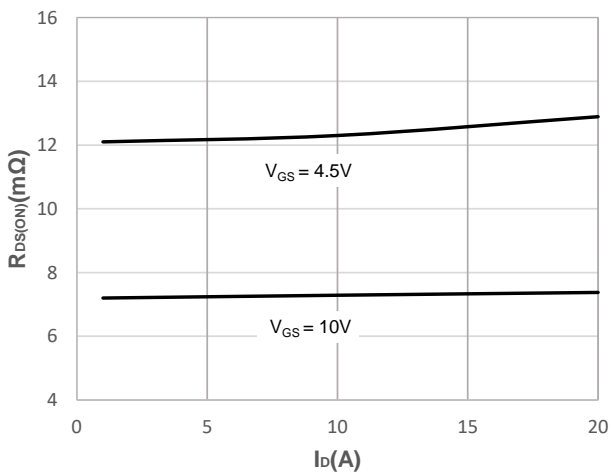


Figure 4: Body Diode Characteristics

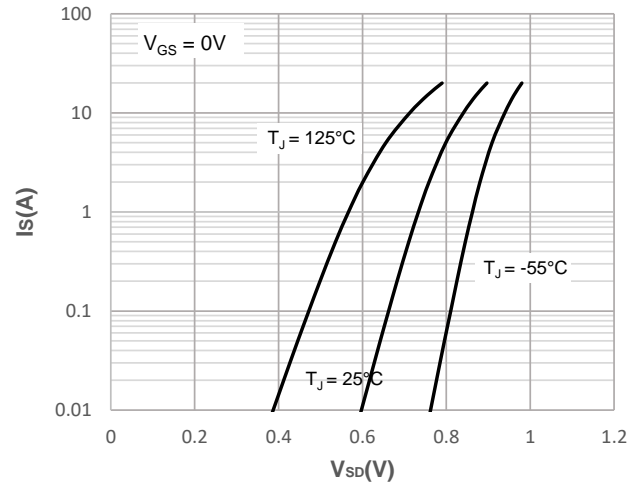


Figure 5: Gate Charge Characteristics

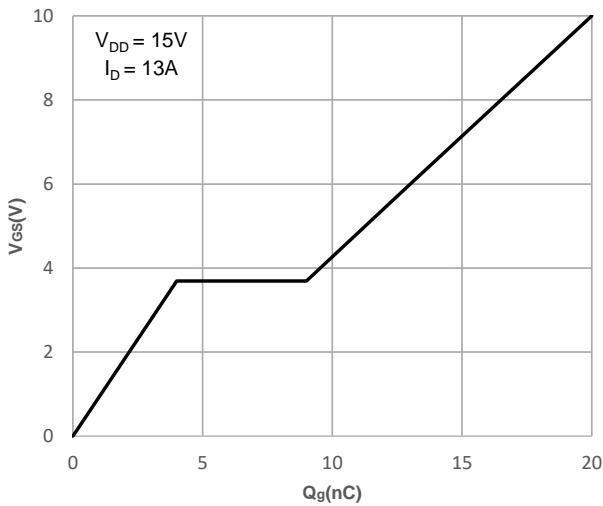
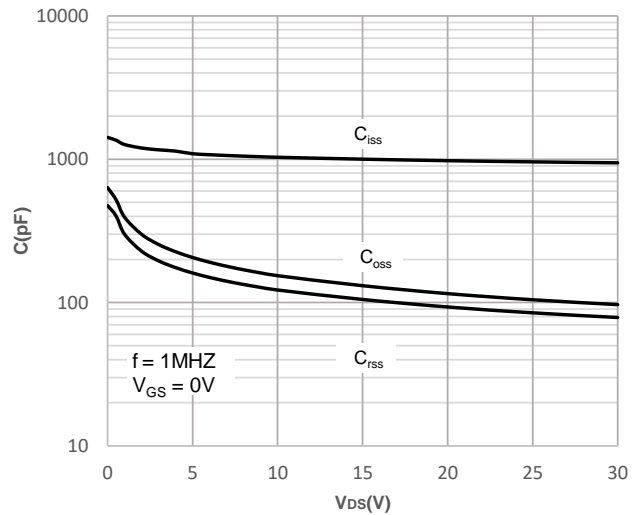


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

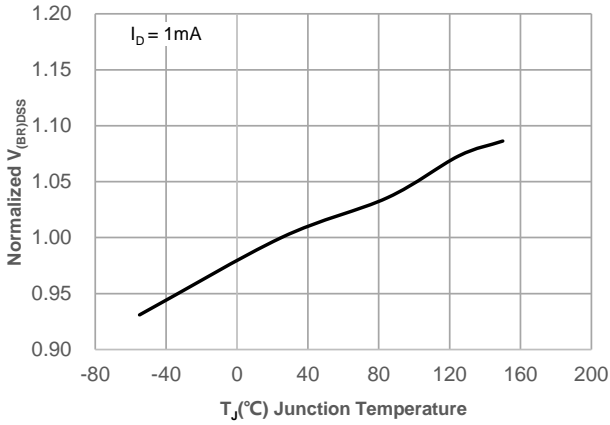


Figure 8: Normalized on Resistance vs. Junction Temperature

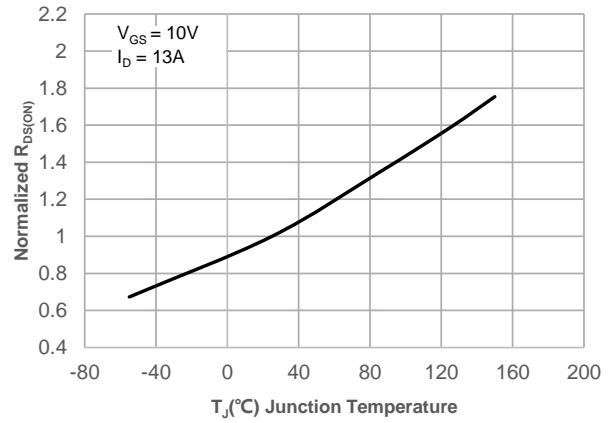


Figure 9: Maximum Safe Operating Area

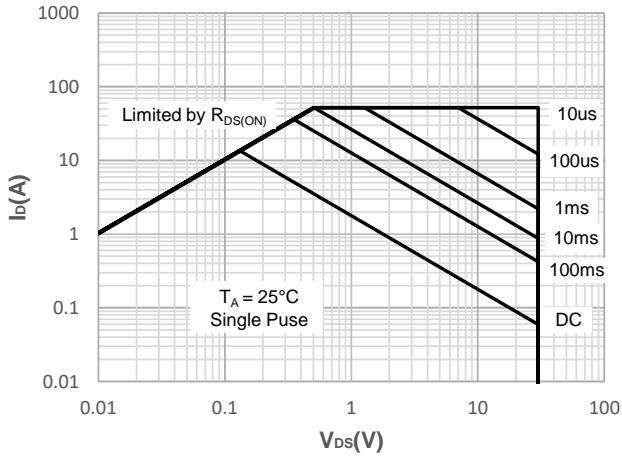


Figure 10: Maximum Continuous Driand Current vs. Ambient Temperature

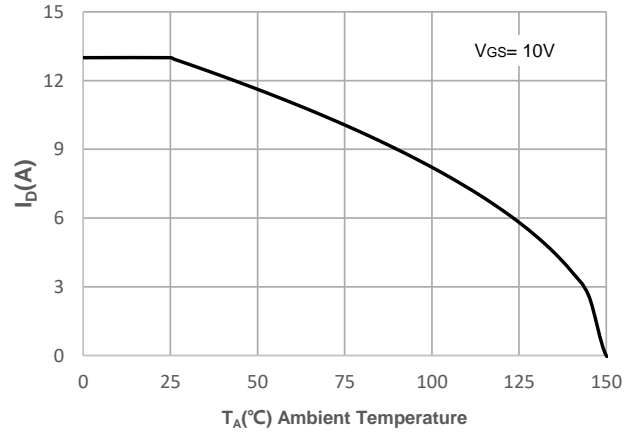


Figure 11: Normalized Maximum Transient Thermal Impedance

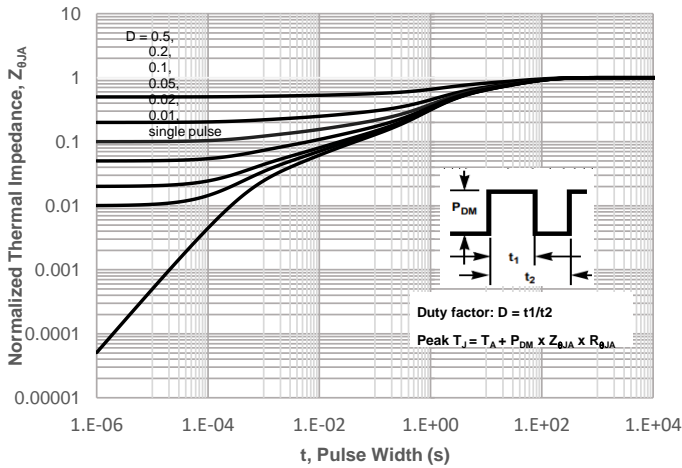
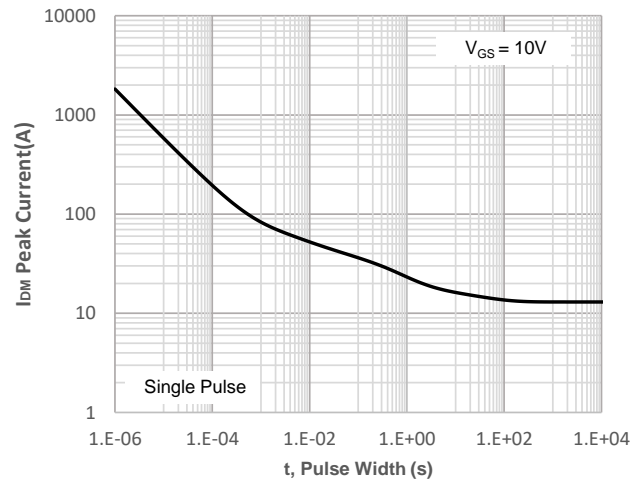


Figure 12: Peak Current Capacity



Test Circuit

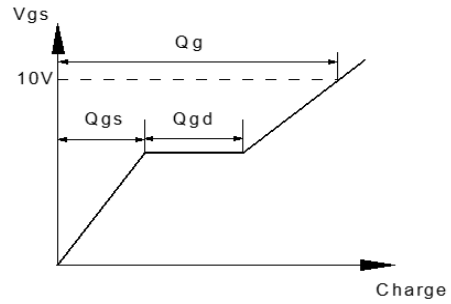
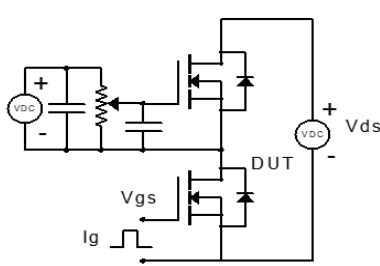


Figure 1: Gate Charge Test Circuit & Waveform

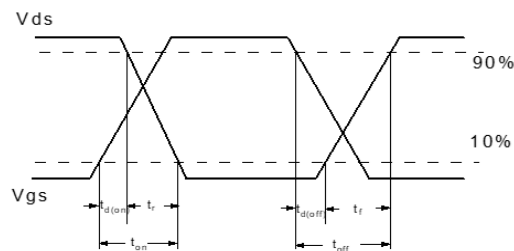
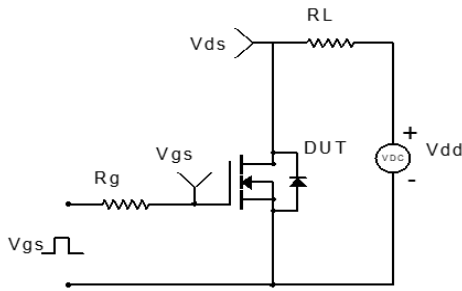


Figure 2: Resistive Switching Test Circuit & Waveform

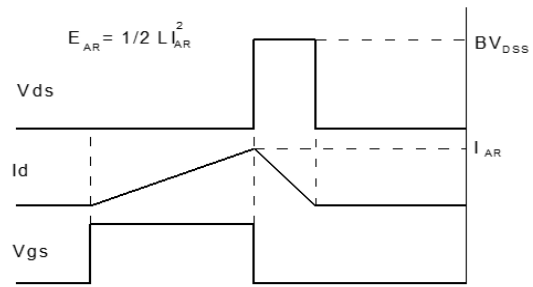
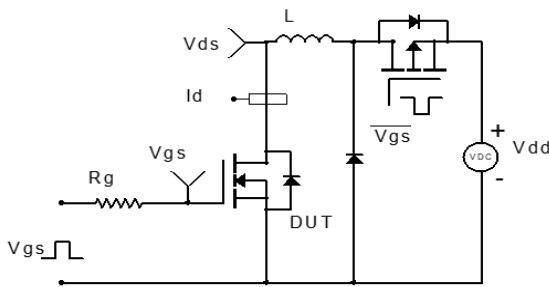


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

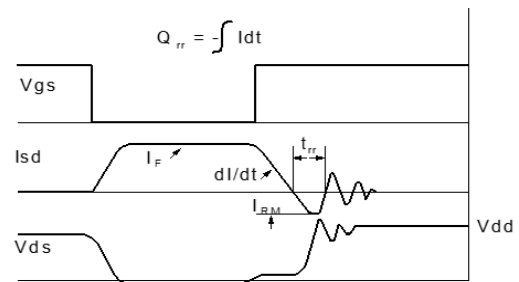
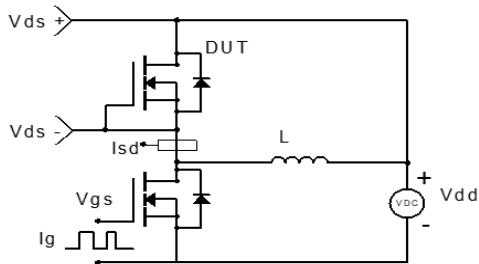
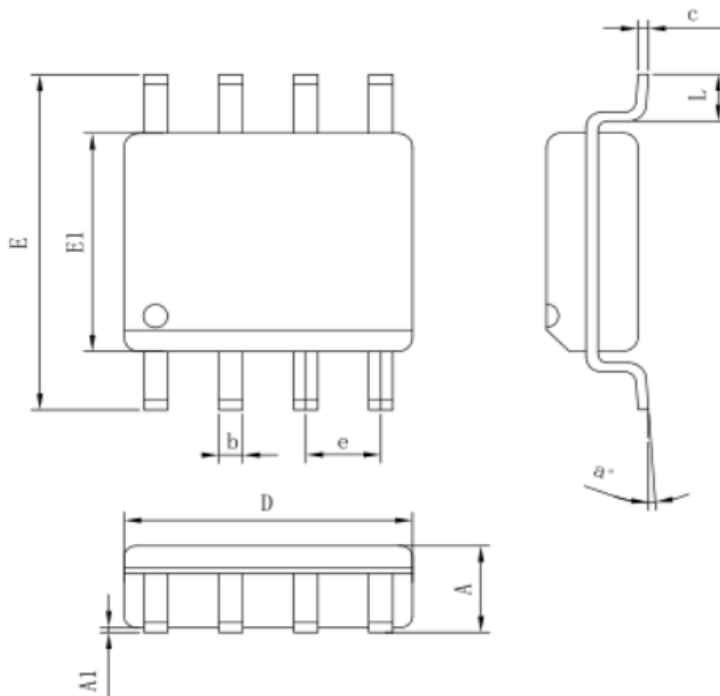


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOP-8)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.75
A1	0.10	--	0.23
b	0.35	--	0.48
c	0.19	--	0.25
D	4.70	4.90	5.00
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	--	0.80
a*	0°	--	8°

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