



Description

JMT P-channel Enhancement Mode Power MOSFET

Features

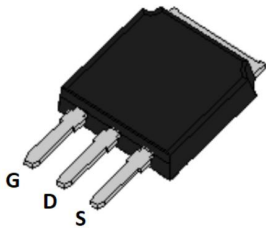
- -20V, -20A
 $R_{DS(ON)} < 16m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 24m\Omega @ V_{GS} = -2.5V$
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

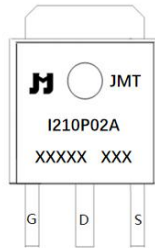
- Load Switch
- PWM Application
- Power management



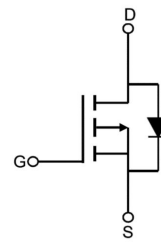
100% UIS TESTED!
100% ΔVds TESTED!



TO-251-3L top view



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner Box (PCS)	Per Carton (PCS)
JMTI210P02A	JMTI210P02A	TUBE	TO-251-3L	75	4,950	29,700

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V _{DSS}	Drain-Source Voltage	-20	V
V _{GSS}	Gate-Source Voltage	±12	V
I _D	Continuous Drain Current	T _C = 25°C	-20
		T _C = 100°C	-13
I _{DM}	Pulsed Drain Current ^{note1}	-80	A
EAS	Single Pulsed Avalanche Energy ^{note2}	36	mJ
P _D	Power Dissipation	13	W
R _{θJC}	Thermal Resistance, Junction to Ambient	12	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +175	°C



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} =0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-0.4	-0.7	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>Note3</small>	V _{GS} = -4.5V, I _D = -10A	-	12	16	mΩ
		V _{GS} = -2.5V, I _D = -5A	-	17	24	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -10V, V _{GS} =0V, f=1.0MHz	-	2000	-	pF
C _{oss}	Output Capacitance		-	242	-	pF
C _{rss}	Reverse Transfer Capacitance		-	231	-	pF
Q _g	Total Gate Charge	V _{DS} = -10V, I _D = -6A, V _{GS} = -4.5V	-	16	-	nC
Q _{gs}	Gate-Source Charge		-	3	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	4	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -10V, I _D = -12A, V _{GS} = -4.5V, R _{GEN} =2.4Ω	-	14	-	ns
t _r	Turn-on Rise Time		-	79	-	ns
t _{d(off)}	Turn-off Delay Time		-	76	-	ns
t _f	Turn-off Fall Time		-	76	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-20	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-80	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -20A	-	-0.8	-1.2	V
trr	Body Diode Reverse Recovery Time	I _F =-2A, di/dt=-100A/μs	-	180	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	300	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25°C, V_{DD}=-10V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=-12A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%



Typical Performance Characteristics

Figure 1: Output Characteristics

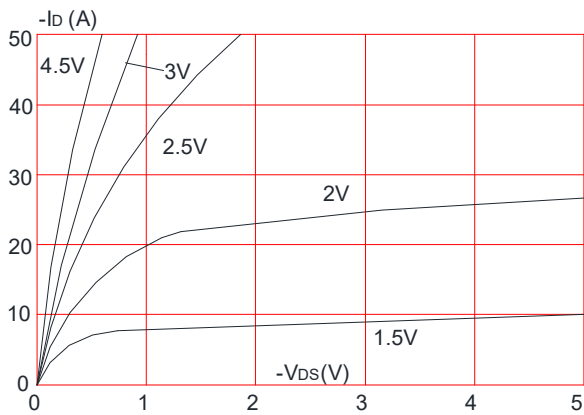


Figure 2: Typical Transfer Characteristics

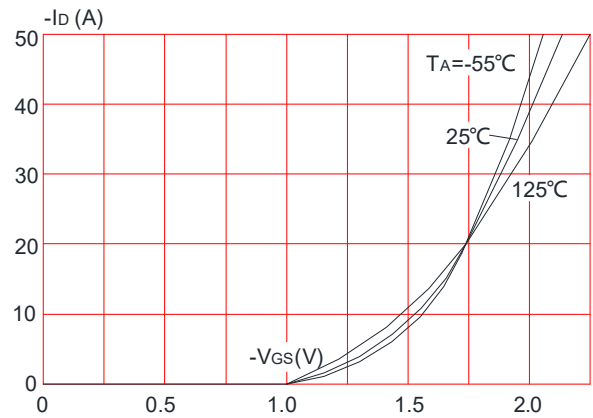


Figure 3: On-resistance vs. Drain Current

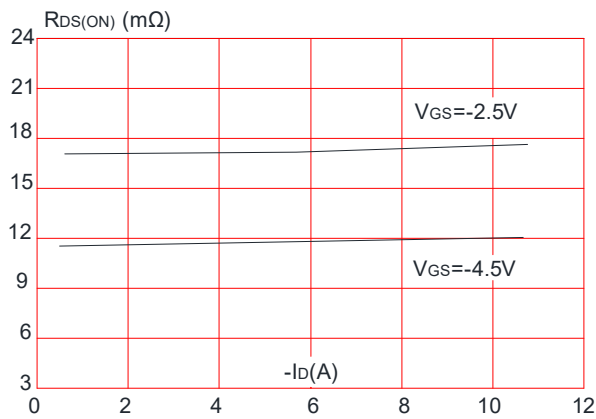


Figure 4: Body Diode Characteristics

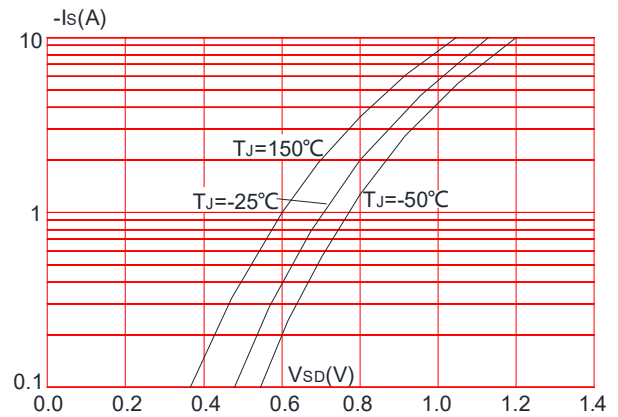


Figure 5: Gate Charge Characteristics

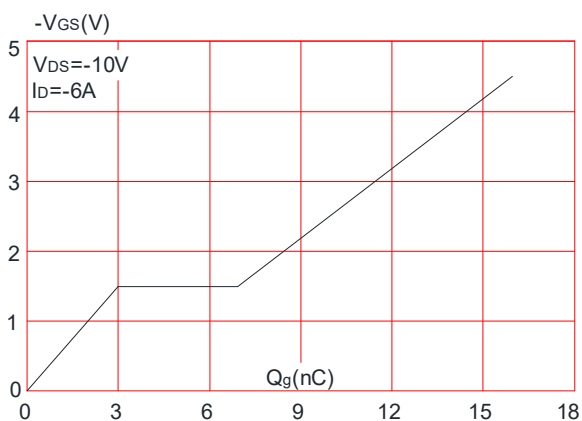


Figure 6: Capacitance Characteristics

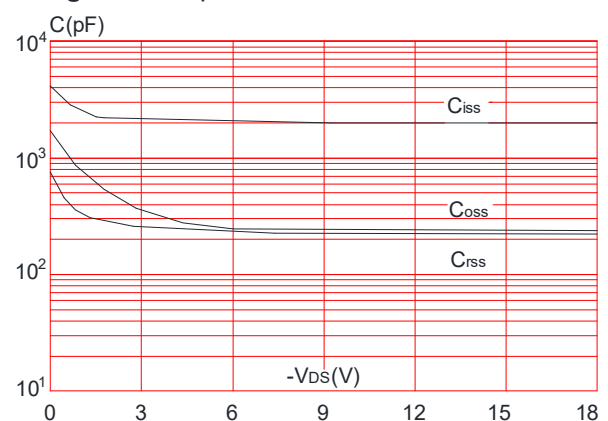




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

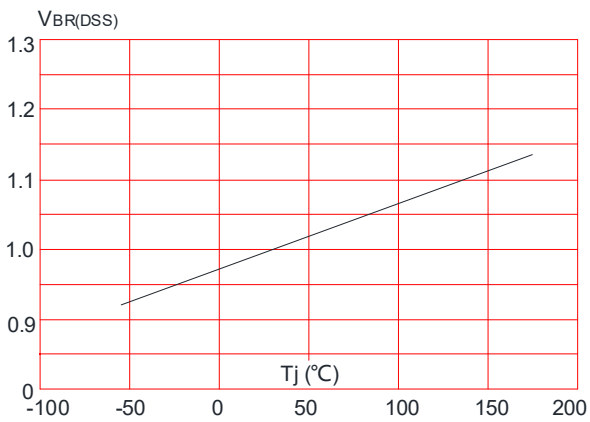


Figure 8: Normalized on Resistance vs. Junction Temperature

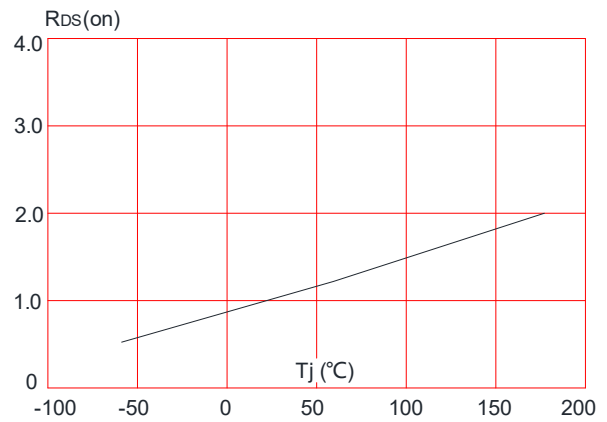


Figure 9: Maximum Safe Operating Area

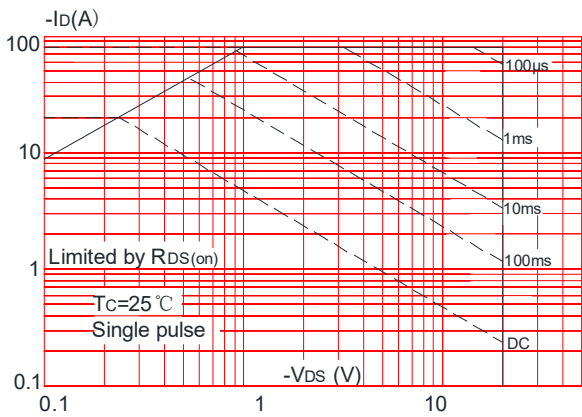


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

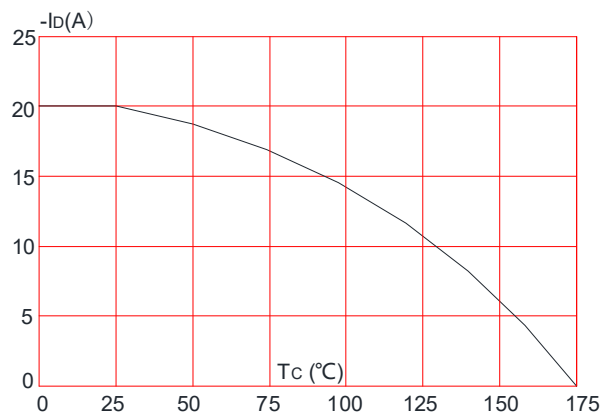
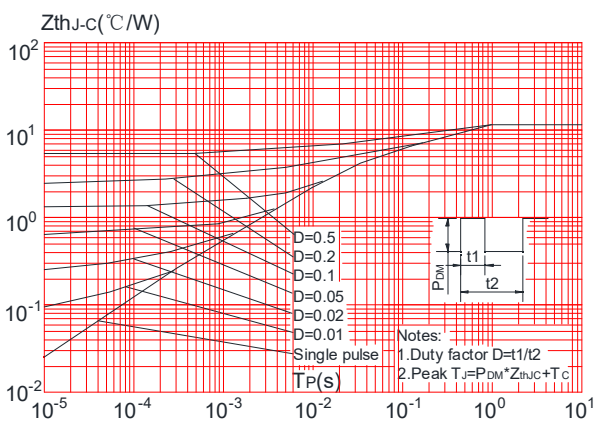
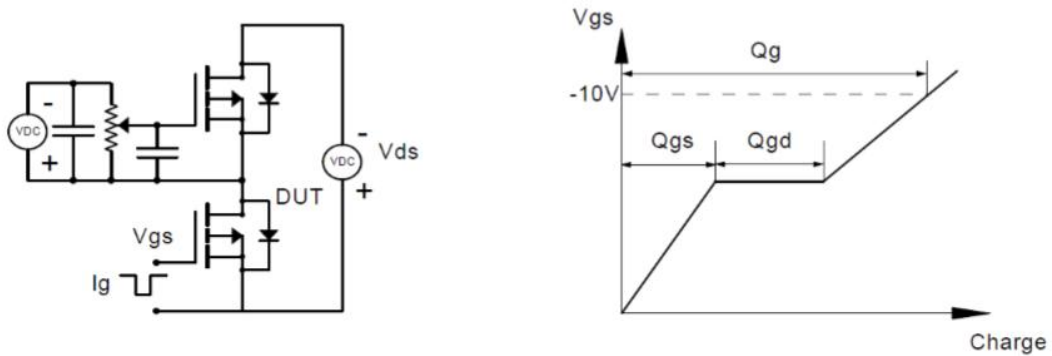


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

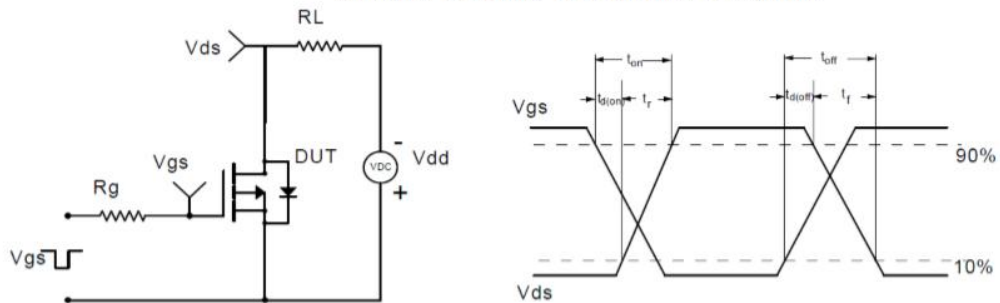


Test Circuit

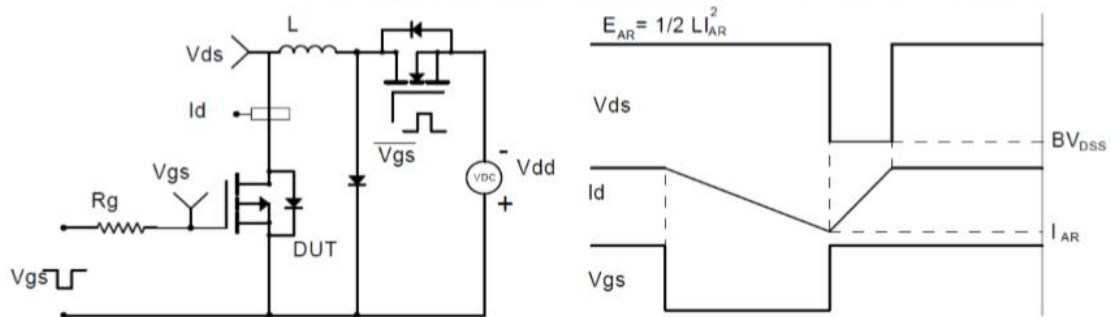
Gate Charge Test Circuit & Waveform



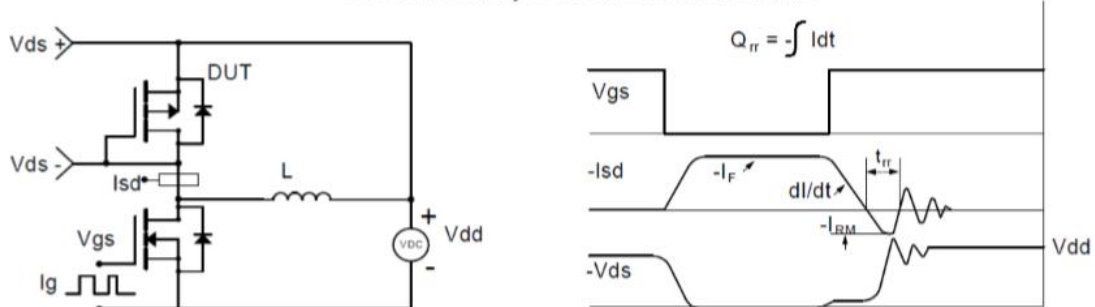
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

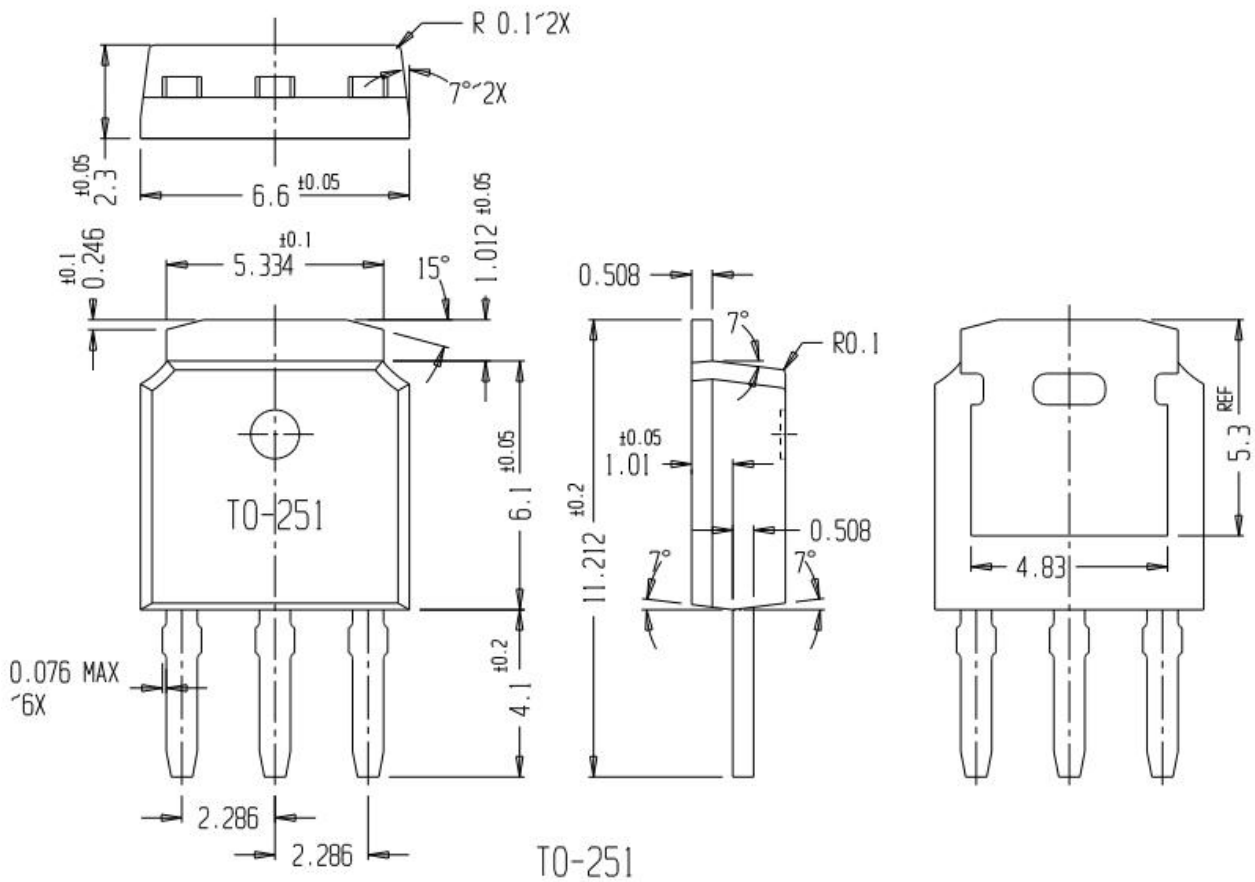


Diode Recovery Test Circuit & Waveforms





Package Mechanical Data- TO-251-3L



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