JMTQ55P02A

Description

JMT P-channel Enhancement Mode Power MOSFET

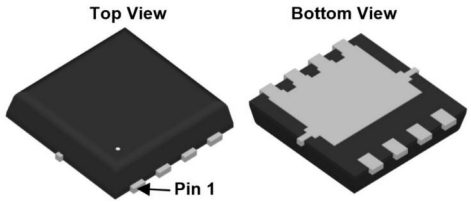
Features

- V_{DS}=-20V, I_D=-55A
  $R_{DS(ON)}$ <8.3mΩ @ V_{GS} = -4.5V
  $R_{DS(ON)}$ <10.4mΩ @ V_{GS} = -2.5V
- High Power and Current Handing Capability
- Lead Free Product is Acquired
- Surface Mount Package

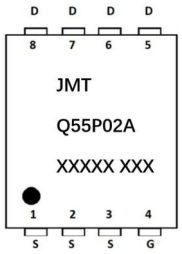
Application

- PWM Applications
- Load Switch

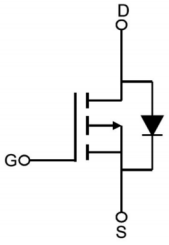
100% UIS TESTED!
100% ΔVds TESTED!



PDFN3x3-8L



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
JMTQ55P02A	JMTQ55P02A	TAPING	PDFN3x3-8L	13inch	5000	50000

Absolute Maximum Ratings (T_C=25℃ 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℃	-55	A
		T_C = 100℃	-35	
I_{DM}	Pulsed Drain Current note1		-220	A
E_{AS}	Single Pulsed Avalanche Energy note2		90	mJ
P_D	Power Dissipation	T_C= 25℃	66	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.9	℃/ W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ 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	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =-4.5V, I_D =-15A	-	6.6	8.3	mΩ
		V_{GS} =-2.5V, I_D =-12A	-	8	10.4	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =-10V, V_{GS} =0V, f = 1.0MHz	-	4770	-	pF
C_{oss}	Output Capacitance		-	570	-	pF
C_{rss}	Reverse Transfer Capacitance		-	502	-	pF
Q_g	Total Gate Charge	V_{DS} =-10V, I_D =-15A, V_{GS} =-4.5V	-	56	-	nC
Q_{gs}	Gate-Source Charge		-	8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	16	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} =-10V, I_D =-13A, R_{GEN}=2.7Ω,V_{GS} =-10V	-	11	-	ns
t_r	Turn-on Rise Time		-	110	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	157	-	ns
t_f	Turn-off Fall Time		-	160	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-55	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-220	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =-30A	-	-	-1.2	V
trr	Reverse Recovery Time	T_J=25℃,I_S=-15A, di/dt=-100A/μs	-	23	-	ns
Qrr	Reverse Recovery Charge		-	14	-	nC

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

2. EAS condition: T_J=25℃,V_{DD}=-10V,V_G=-10V, R_G=25Ω, L=0.5mH,I_{AS}=-19A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure1: Output Characteristics

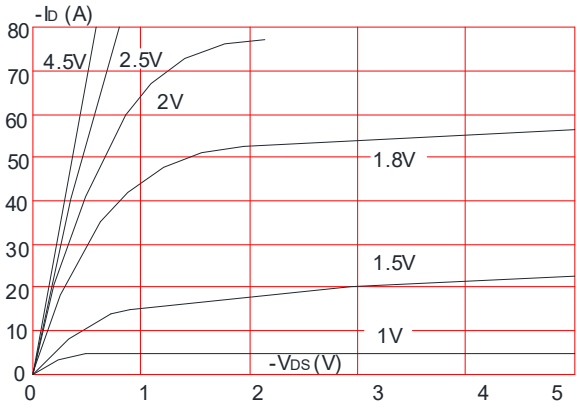


Figure 2: Typical Transfer Characteristics

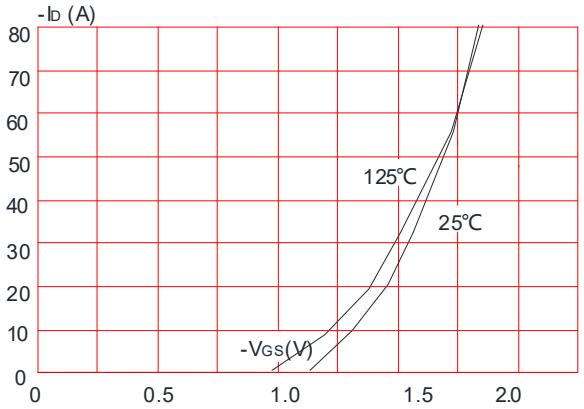


Figure 3: On-resistance vs. Drain Current

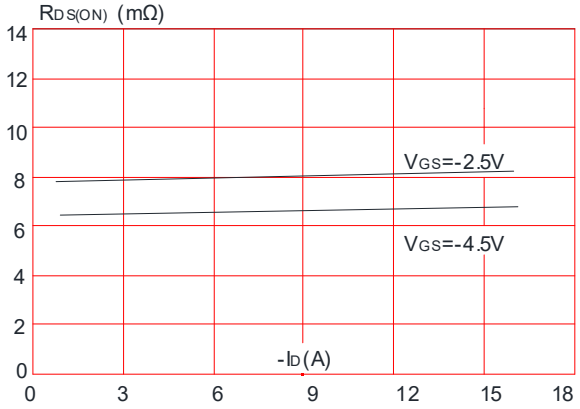


Figure 4 : Body Diode Characteristics

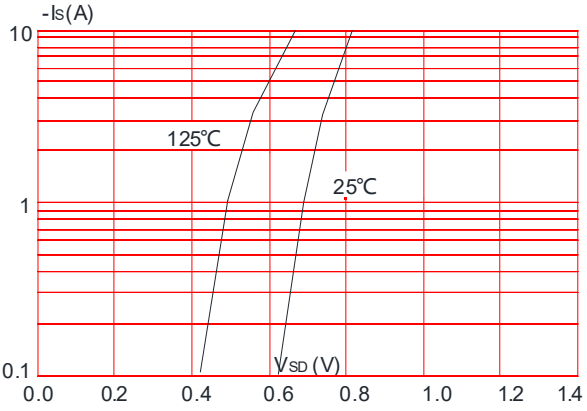


Figure 5: Gate Charge Characteristics

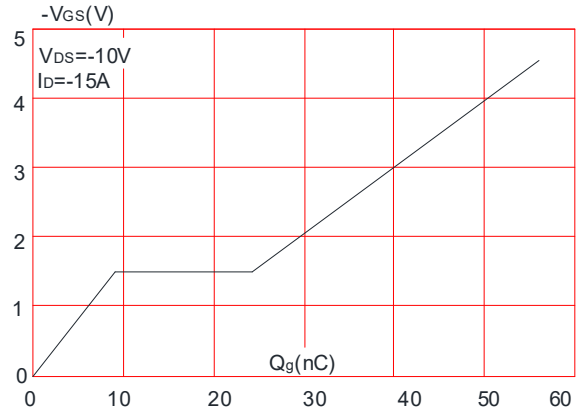


Figure 6: Capacitance Characteristics

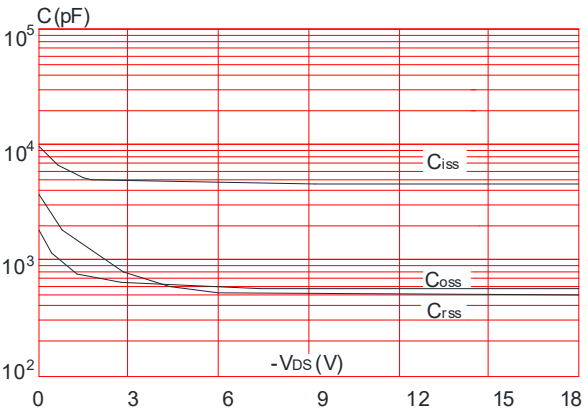


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

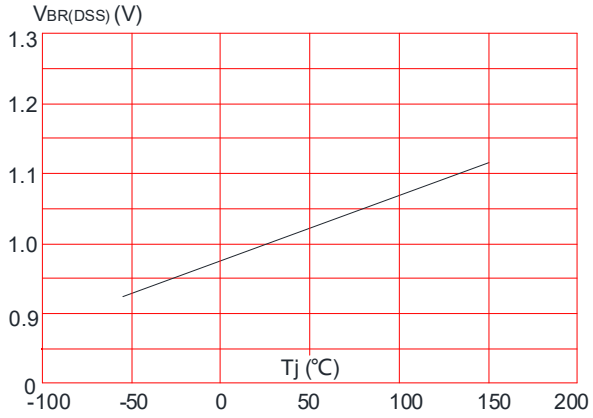


Figure 8: Normalized on Resistance vs. Junction Temperature

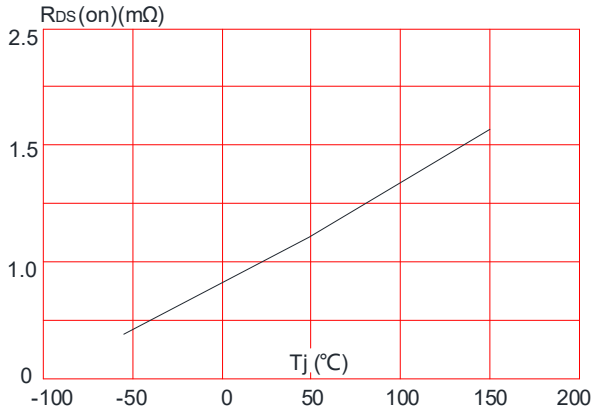


Figure 9: Maximum Safe Operating Area

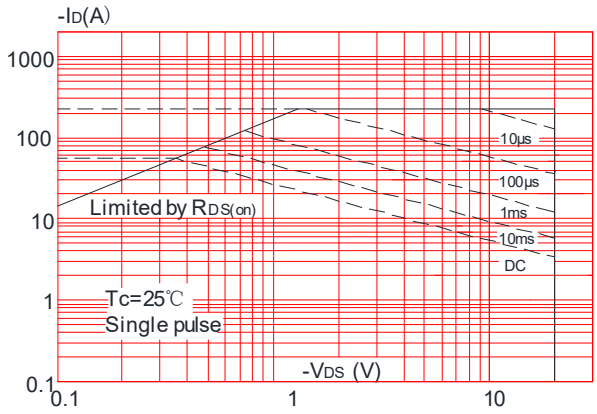


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

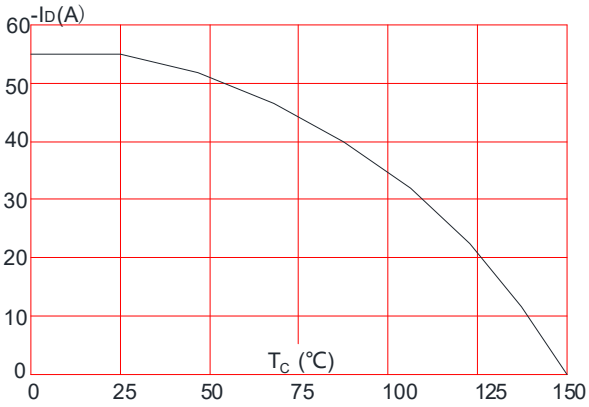
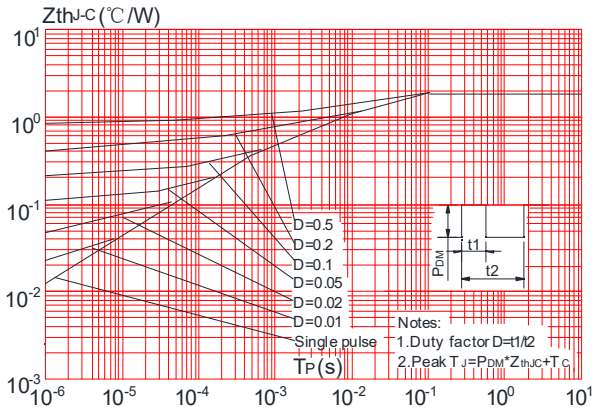
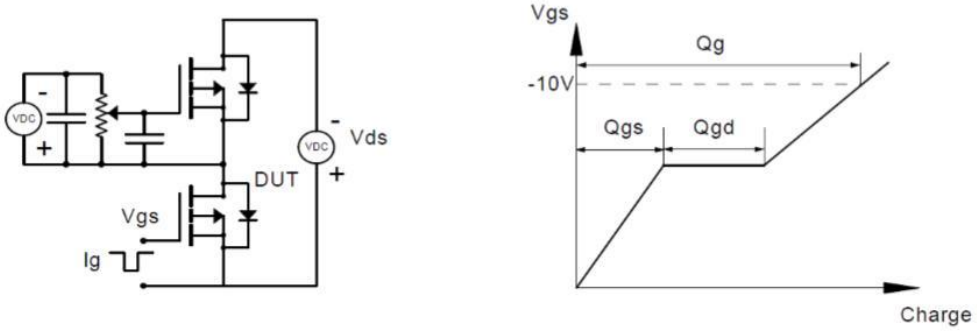


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

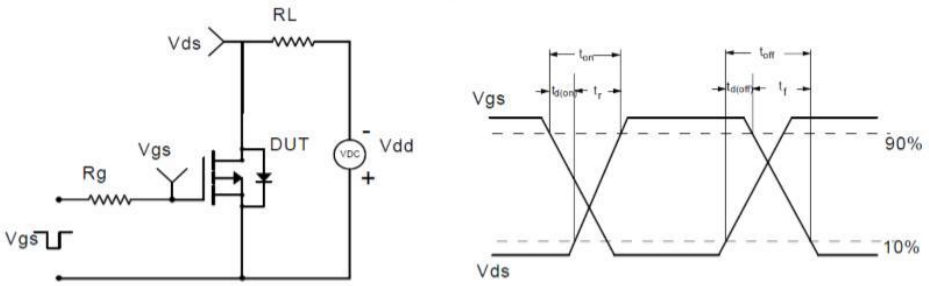


Test Circuit

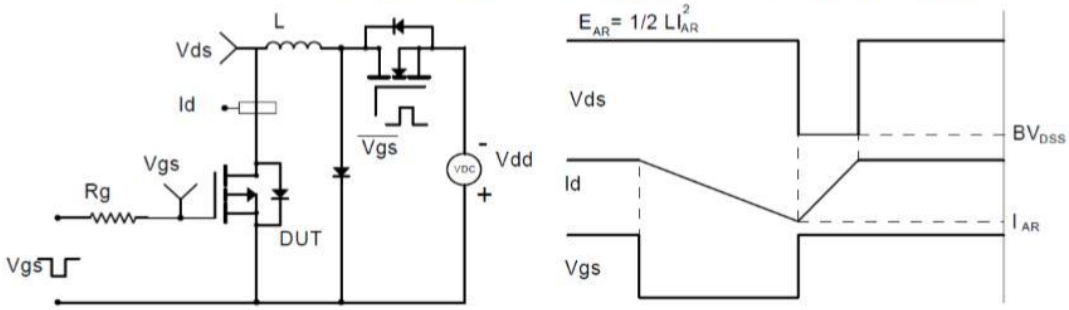
Gate Charge Test Circuit & Waveform



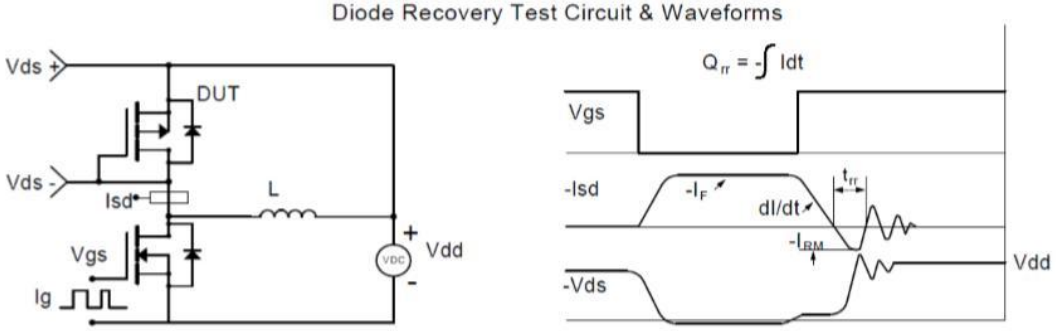
Resistive Switching Test Circuit & Waveforms



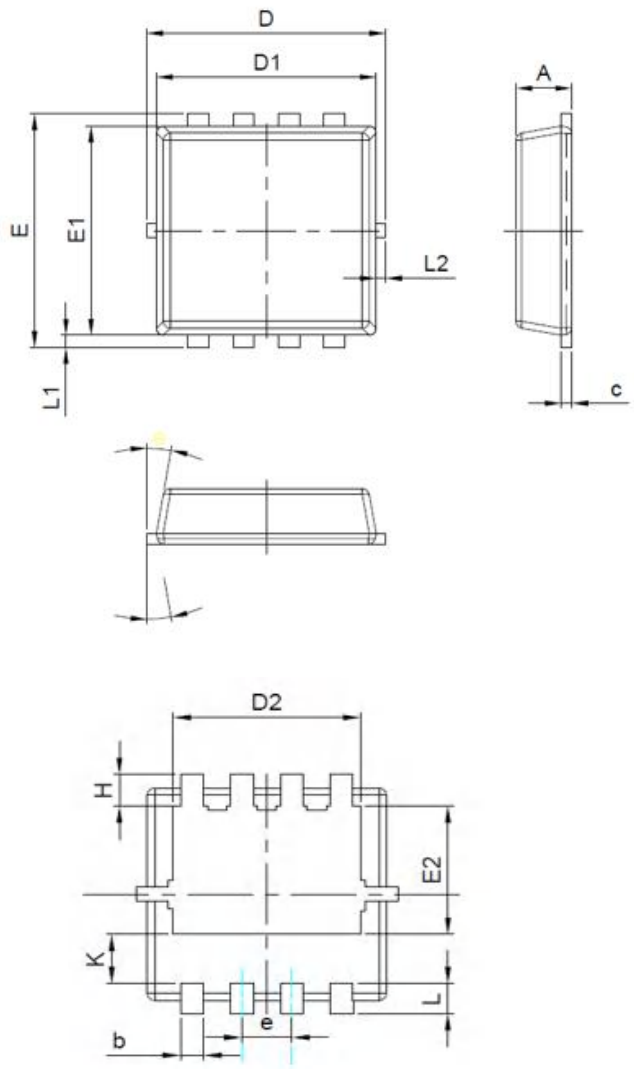
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-PDFN3x3-8L



COMMON DIMENSIONS

(UNITS OF MEASURE = MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
b	0.25	0.30	0.39
c	0.14	0.15	0.25
D	3.20	3.30	3.40
D1	3.00	3.15	3.30
D2	2.35	2.45	2.55
e	0.65 BSC		
E	3.25	3.35	3.45
E1	2.85	3.00	3.15
E2	1.635	1.735	1.835
H	0.33	0.48	0.63
K	0.585	0.685	0.785
L	0.30	0.40	0.50
L1	0.05	0.15	0.25
L2	–	–	0.15
Θ	8°	10°	12°