JMTV075N03A

Description

JMT N-channel Enhancement Mode Power MOSFET
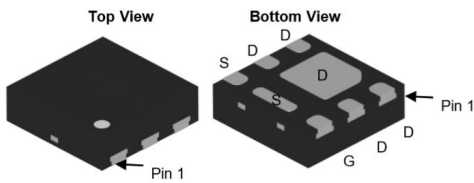
Features

- 30V, 22A

  $R_{DS(ON)}$<8mΩ @ V_{GS} =10V

  $R_{DS(ON)}$<13mΩ @ V_{GS} =4.5V
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
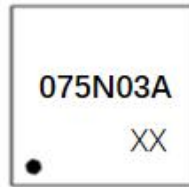- Lead free product is acquired

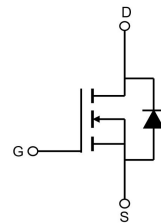**Application**

- Load Switch
- PWM Application
- Power management

100% UIS TESTED!
100% ΔVds TESTED!

RoHS

| **DFN2020-6L** | **Marking and pin Assignment** | **Schematic Diagram** |

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
075N03A	JMTV075N03A	TAPING	DFN2020-6L	7inch	3000	120000

Absolute Maximum Ratings (T$_C$=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	22	A
		T_C = 100℃	14	A
I_{DM}	Pulsed Drain Current [note1]		88	A
E_{AS}	Single Pulsed Avalanche Energy [note2]		42	mJ
P_D	Power Dissipation	T_C = 25℃	10.4	W
$R_{θJC}$	Thermal Resistance, Junction to Case		12	℃/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	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V,	-	-	1.0	µA
I_{GSS}	Gate to 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	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=15A	-	6.3	8	mΩ
		V_{GS}=4.5V, I_D=10A	-	9.8	13	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	1072	-	pF
C_{oss}	Output Capacitance		-	170	-	pF
C_{rss}	Reverse Transfer Capacitance		-	128	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=7A, V_{GS}=10V	-	23	-	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_{DS}=15V,I_D=7A, R_{GEN}=3Ω, V_{GS}=10V	-	7.5	-	ns
t_r	Turn-on Rise Time		-	40	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	24	-	ns
t_f	Turn-off Fall Time		-	36	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current	-	-	-	22	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current	-	-	-	88	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=22A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=7A,dI/dt=100A/µs	-	11	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	4	-	nC

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

2. EAS condition: T_J=25℃, V_{GS}=15V, R_G=25Ω, L=0.5mH, I_{AS}=13A

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

Typical Performance Characteristics
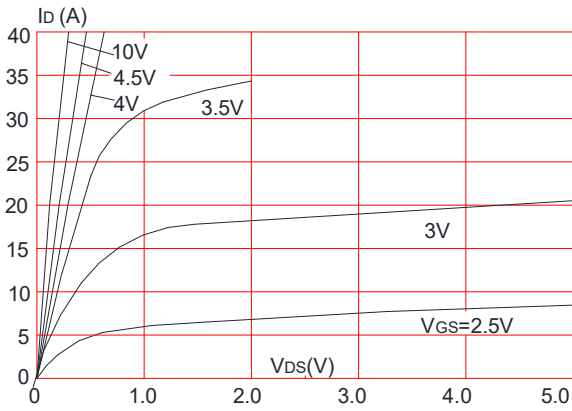
Figure1: Output Characteristics
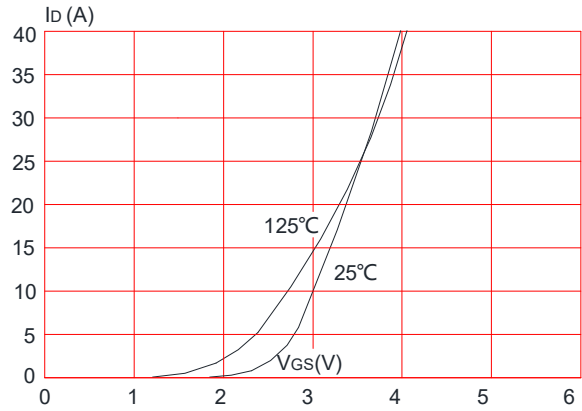

Figure 2: Typical Transfer Characteristics

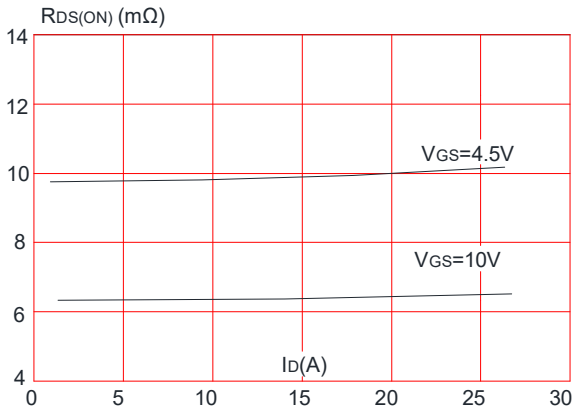**Figure 3:** On-resistance vs. Drain Current

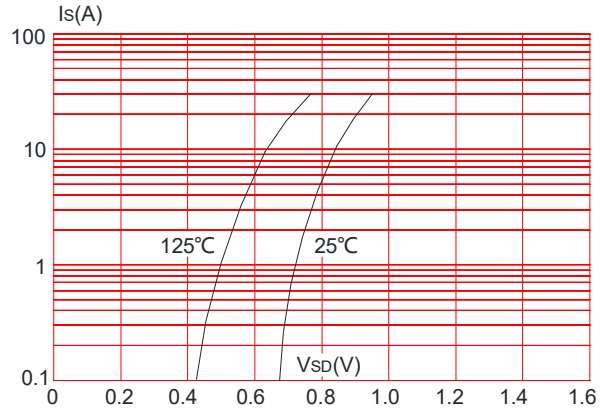**Figure 4:** Body Diode Characteristics

Figure 5: Gate Charge Characteristics
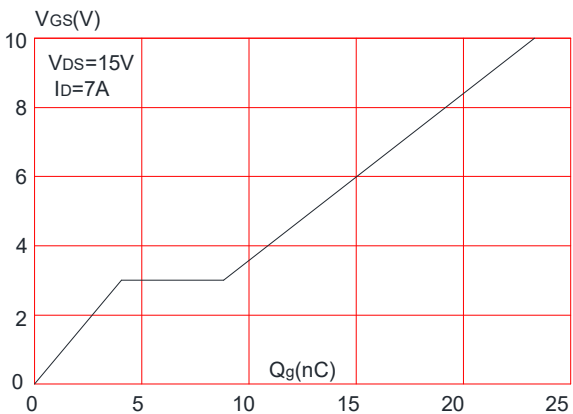

Figure 6: Capacitance Characteristics
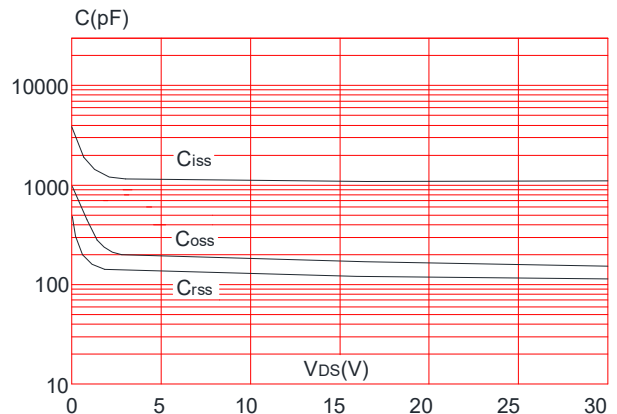
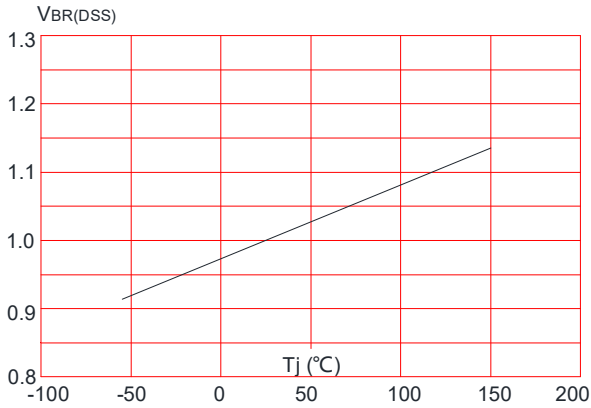**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

$V_{BR(DSS)}$

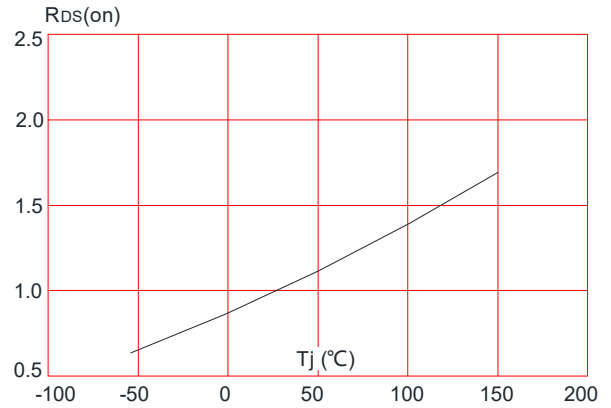**Figure 8:** Normalized on Resistance vs. Junction Temperature

$R_{DS}(on)$

Figure 9: Maximum Safe Operating Area

$I_D(A)$

Limited by $R_{DS(on)}$

10μs
100μs
1ms
10ms
100ms
DC

T_C=25℃
Single pulse

V_{DS}(V)
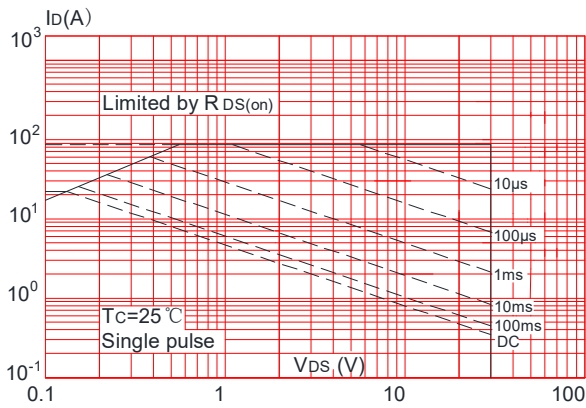
Figure 10: Maximum Continuous Drain Current vs. Case Temperature

$I_D(A)$

T_C (℃)
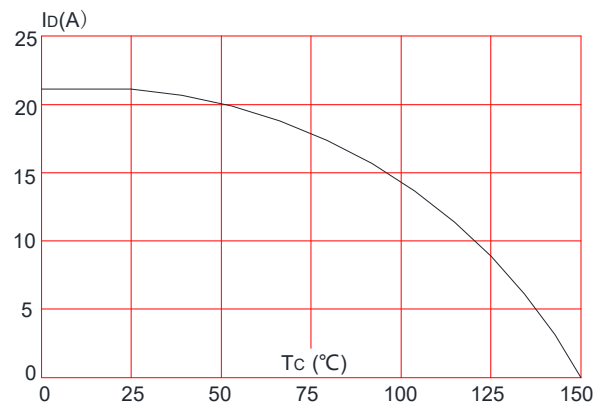
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Zth_{J-C}(℃/W)

D=0.5
D=0.2
D=0.1
D=0.05
D=0.02
D=0.01
Single pulse

P_{DM}

t1
t2

Notes:
1.Duty factor D=t1/t2
2.Peak T_J=P_{DM}*Z_{thJC}+T_C
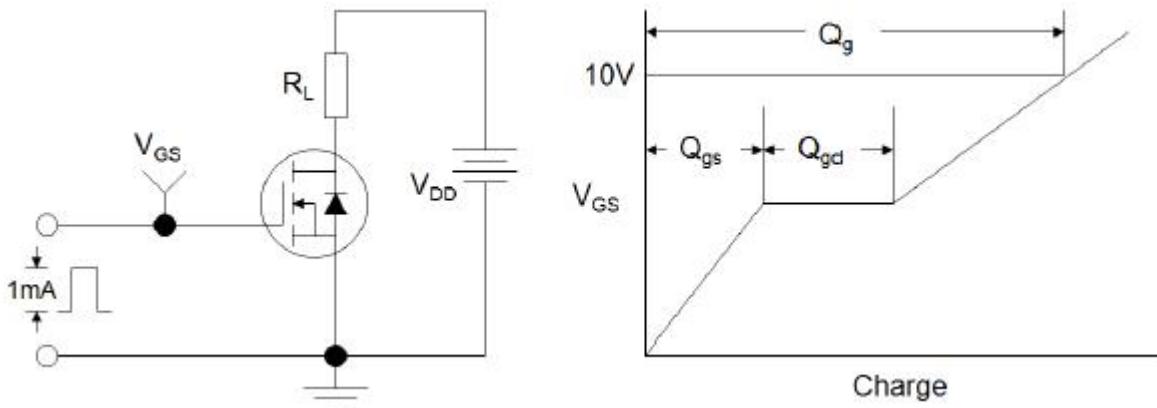
T_P(s)
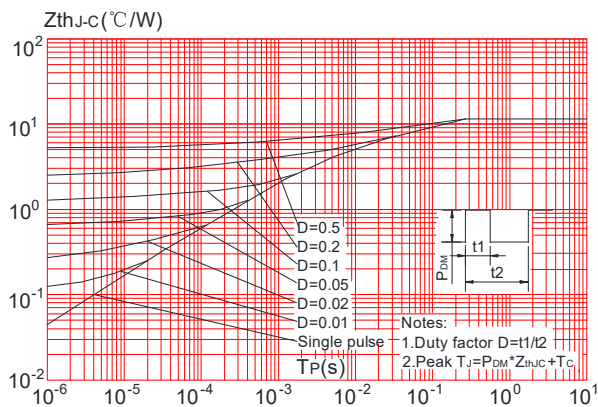
Test Circuit

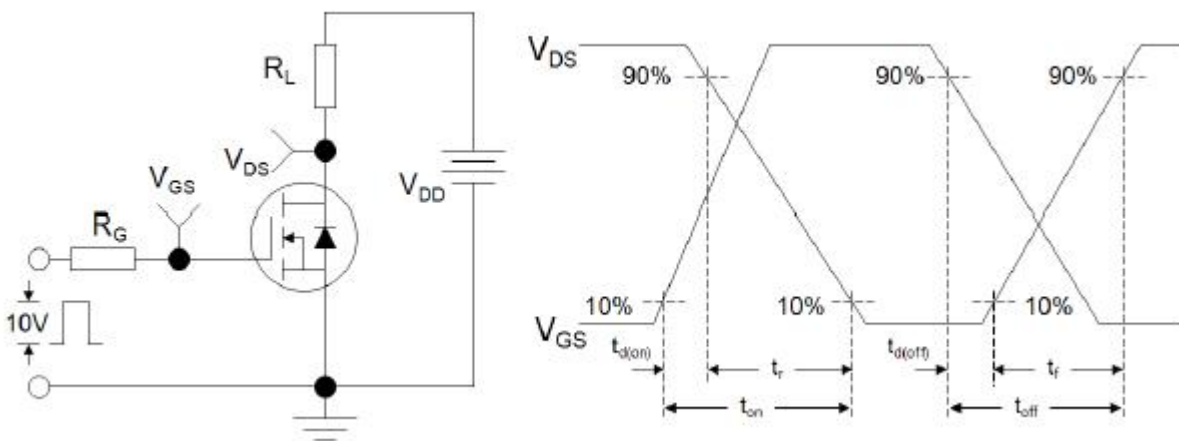**Figure1:Gate Charge Test Circuit & Waveform**

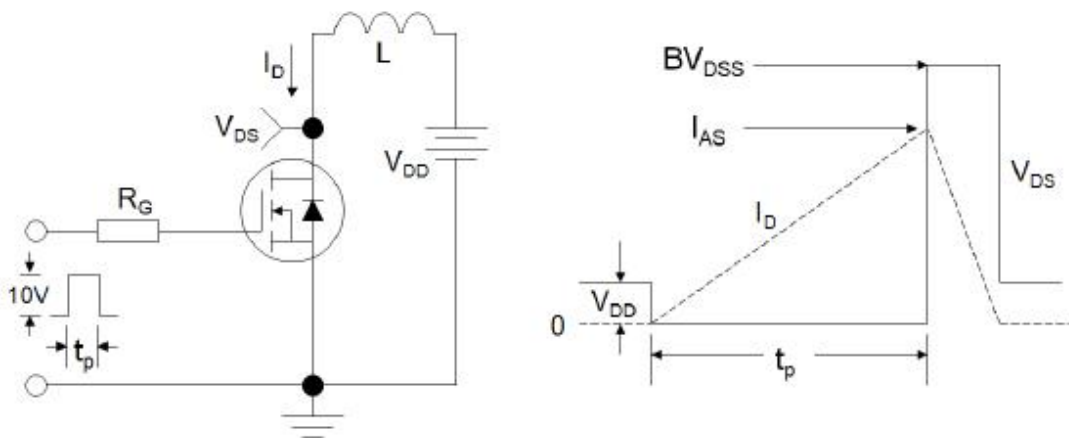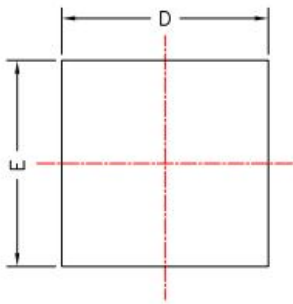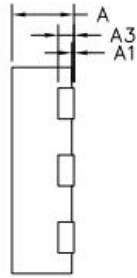**Figure 2: Resistive Switching Test Circuit & Waveforms**

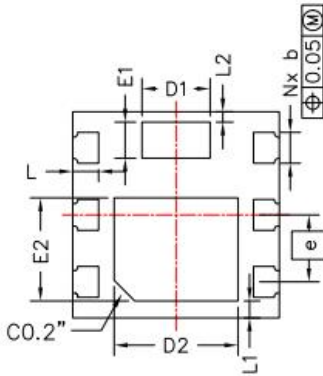**Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms**

Package Mechanical Data- DFN2020-6L

Top View   Side View

Bottom View

SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.750	0.800	0.028	0.030	0.031
A1	---	---	0.050	----	----	0.002
A3	0.195	0.203	0.211	0.008	0.008	0.008
b	0.250	0.300	0.350	0.010	0.012	0.014
e	0.65BSC			0.026 BSC		
D	1.900	2.000	2.100	0.075	0.079	0.083
E	1.900	2.000	2.100	0.075	0.079	0.083
D1	0.560	0.660	0.760	0.022	0.026	0.030
E1	0.250	0.350	0.450	0.010	0.014	0.018
D2	1.100	1.200	1.300	0.043	0.047	0.051
E2	0.900	1.000	1.100	0.035	0.039	0.043
L	0.150	0.250	0.350	0.006	0.010	0.014
L1	0.065	0.165	0.265	0.003	0.006	0.010
L2	0.000	0.100	0.200	0.000	0.004	0.008