



## Description

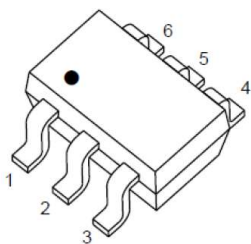
### JMT N-channel Enhancement Mode Power MOSFET

#### Features

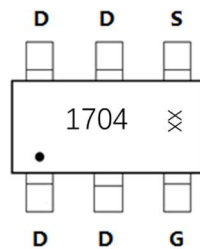
- 40V, 8A  
 $R_{DS(ON)} < 22.5m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 30m\Omega @ V_{GS} = 4.5V$
- Lead free and Green Device Available
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

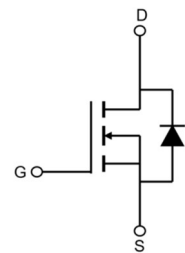
- Load Switch
- PWM Application
- Power management



SOT-23-6L



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
1704	JMTM170N04A	TAPING	SOT-23-6L	7inch	3000	18000

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	40	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> = 25°C	8
		T <sub>A</sub> = 100°C	5
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	32	A
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> = 25°C	2.5
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	50	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	40	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =4A	-	17.5	22.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	-	21.5	30	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1.0MHz	-	980	-	pF
C <sub>oss</sub>	Output Capacitance		-	86.2	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	68.5	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =20V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	-	11	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.9	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	2.2	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =20V, I <sub>D</sub> =8A, R <sub>L</sub> =1Ω, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	-	11	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	13	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	36	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	9	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =8A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =8A, di/dt=100A/μs	-	19	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	11	-	nC

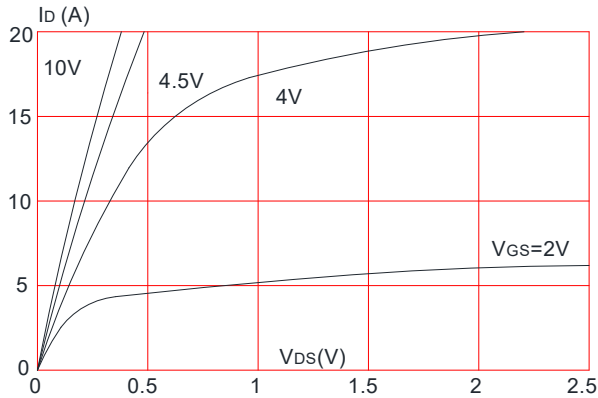
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

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

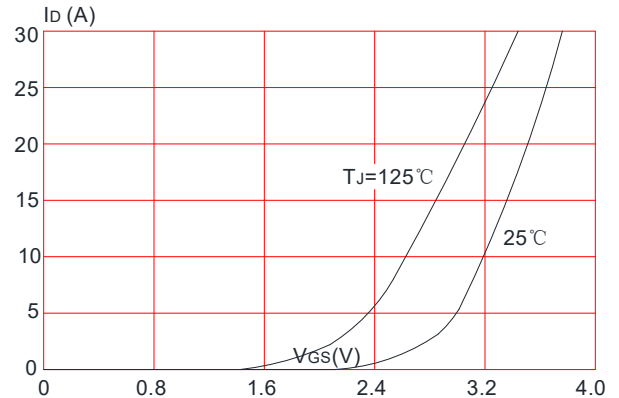


## Typical Performance Characteristics

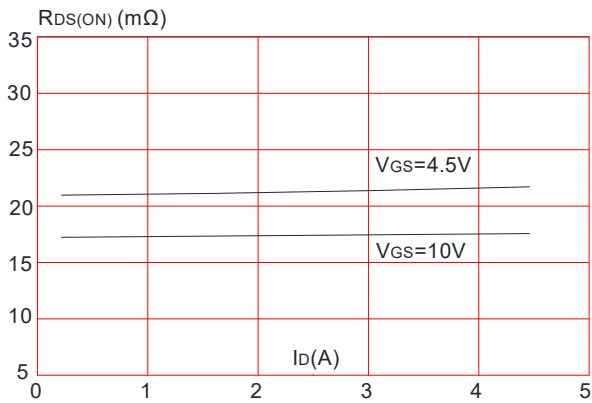
**Figure 1:** Output Characteristics



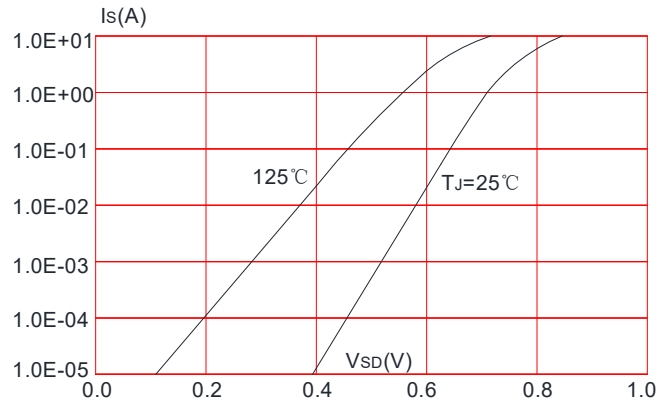
**Figure 2:** Typical Transfer Characteristics



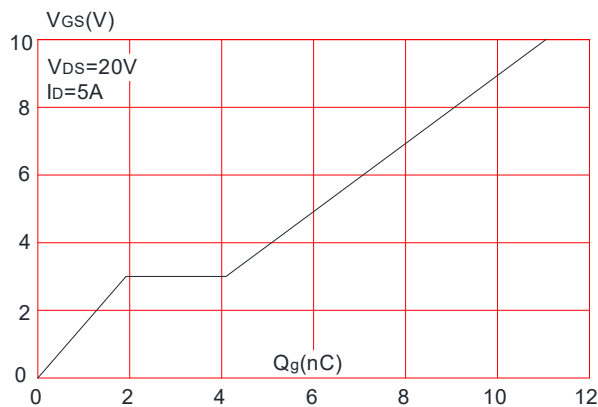
**Figure 3:** On-resistance vs. Drain Current



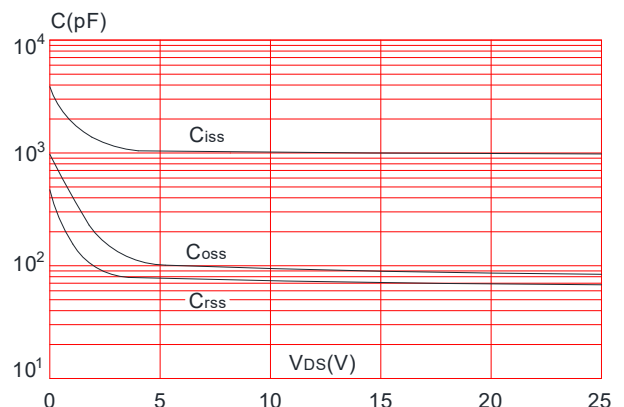
**Figure 4:** Body Diode Characteristics



**Figure 5:** Gate Charge Characteristics

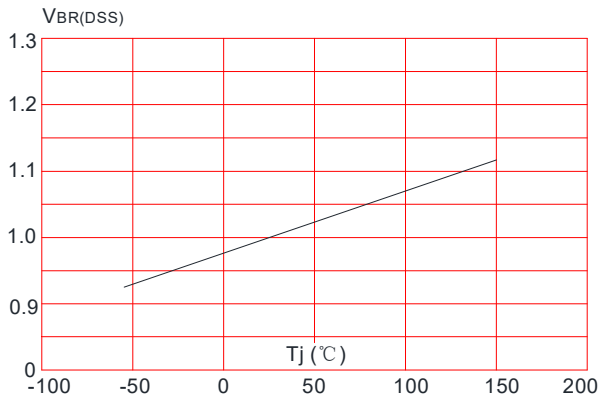


**Figure 6:** Capacitance Characteristics

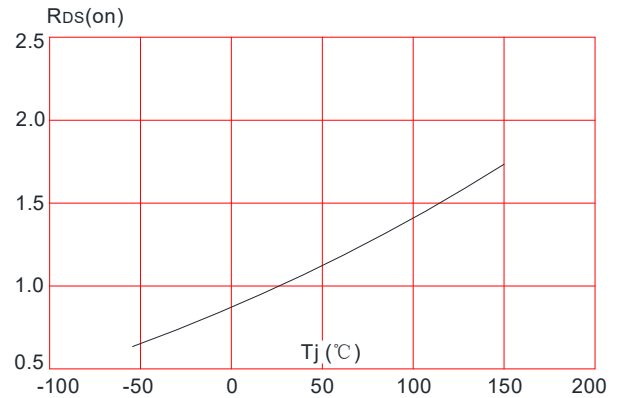




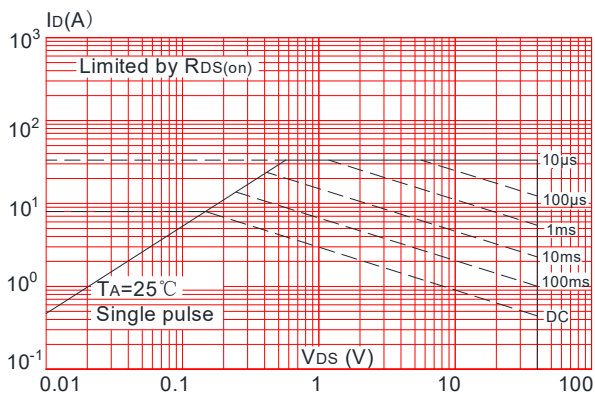
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



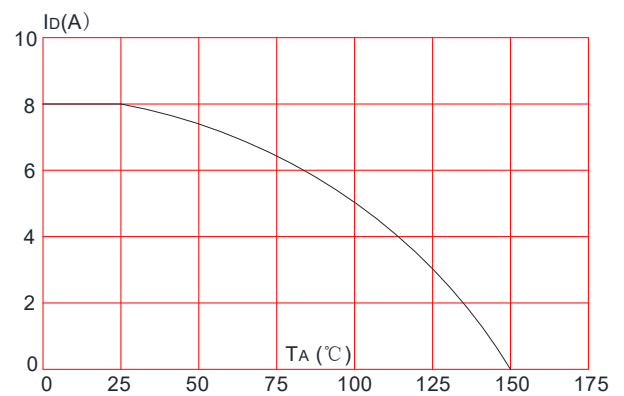
**Figure 8: Normalized on Resistance vs. Junction Temperature**



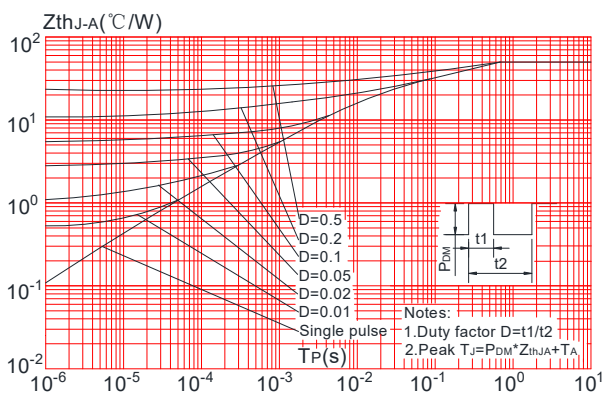
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**



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



## Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform



Figure 2: Resistive Switching Test Circuit & Waveforms

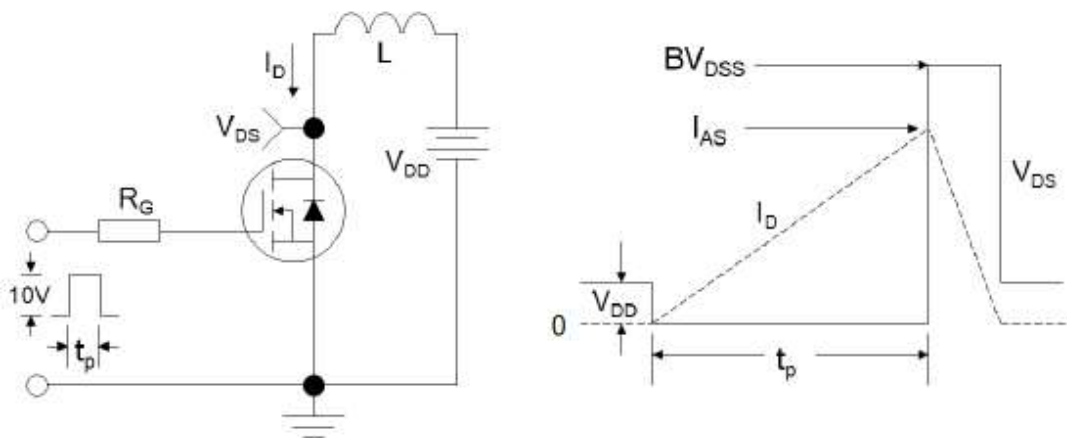
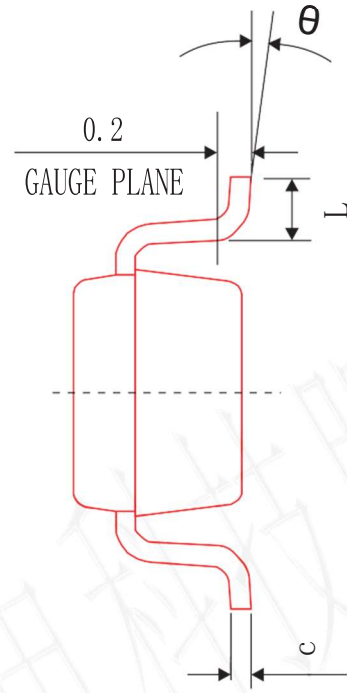
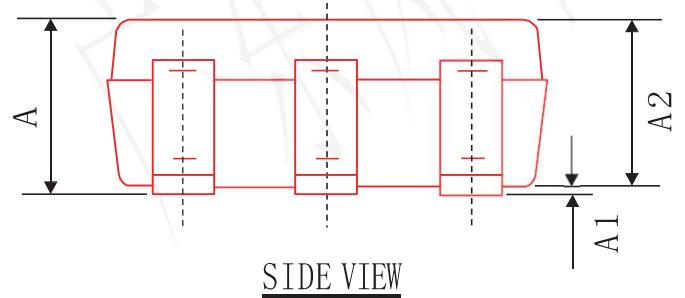
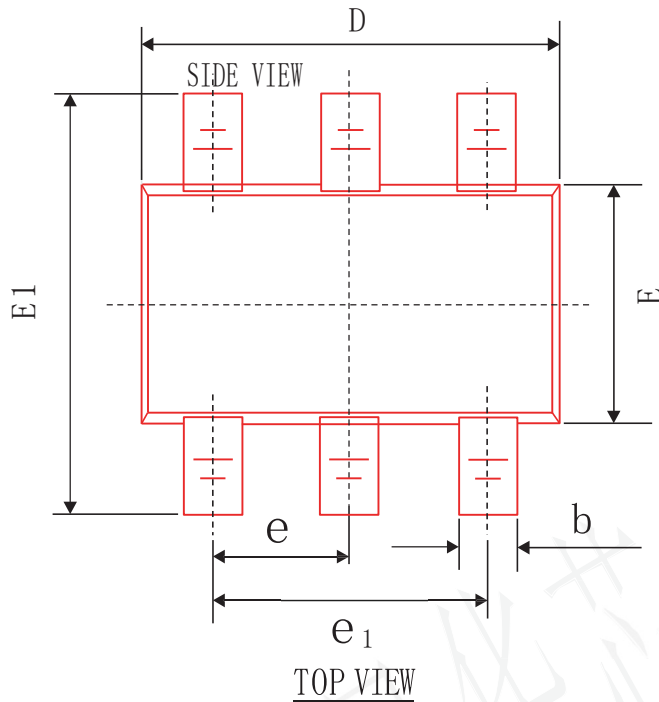


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-SOT-23-6L



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE=mm)


SYMBOL	MIN	NOM	MAX
A	—	—	1.20
A1	0.00	0.05	0.10
A2	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.119	0.127	0.135
e <sub>1</sub>	1.80	1.90	2.00
D	2.80	2.90	3.00
E	1.50	1.60	1.70
E1	2.60	2.80	3.00
L	0.30	0.45	0.60
θ	0°	4°	8°
e	0.95BSC		



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