



Description

JMT N-channel Enhancement Mode Power MOSFET

Features

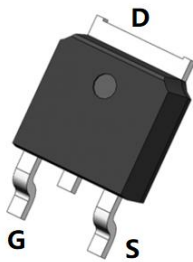
- 100V,59A
 $R_{DS(ON)} < 20m\Omega @ V_{GS} = 10V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

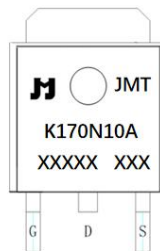
- Load Switch
- PWM Application
- Power management



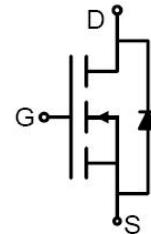
100% UIS TESTED!
100% ΔVds TESTED!



TO-252-3L(DPAK) 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)
JMTK170N10A	JMTK170N10A	TAPING	TO-252-3L	13inch	2500	25000

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 25	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	59
		$T_C = 100^\circ C$	38
I_{DM}	Pulsed Drain Current ^{note1}	236	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	110	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	153
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.98	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	$^\circ C$



Electrical Characteristics (T_C=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	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±25V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note3</small>	V _{GS} =10V, I _D =30A	-	15	20	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	5211	-	pF
C _{oss}	Output Capacitance		-	232	-	pF
C _{rss}	Reverse Transfer Capacitance		-	163	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	87	-	nC
Q _{gs}	Gate-Source Charge		-	27	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	21	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =2A, R _L =15Ω, R _{GEN} =2.5Ω, V _{GS} =10V	-	18	-	ns
t _r	Turn-on Rise Time		-	8	-	ns
t _{d(off)}	Turn-off Delay Time		-	50	-	ns
t _f	Turn-off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	59	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	236	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =59A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	T _J = 25°C I _F =28A, di/dt=100A/μs	-	32	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	55	-	nC

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

2. EAS condition: T_J=25°C, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=21A

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



Typical Performance Characteristics

Figure 1: Output Characteristics

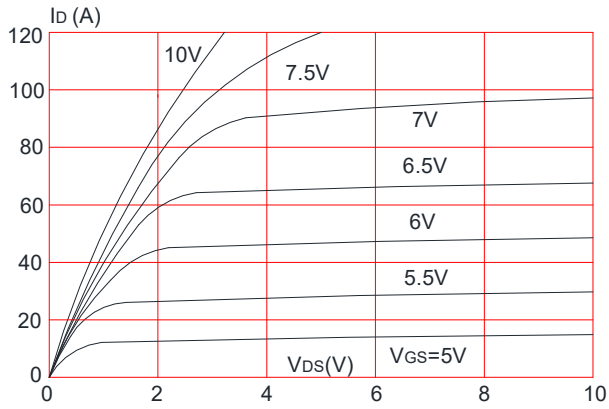


Figure 2: Typical Transfer Characteristics

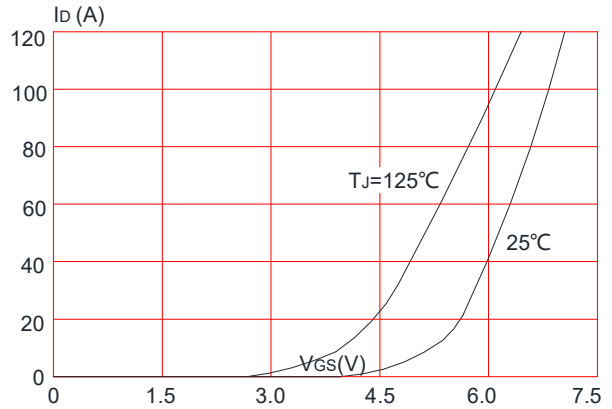


Figure 3: On-resistance vs. Drain Current

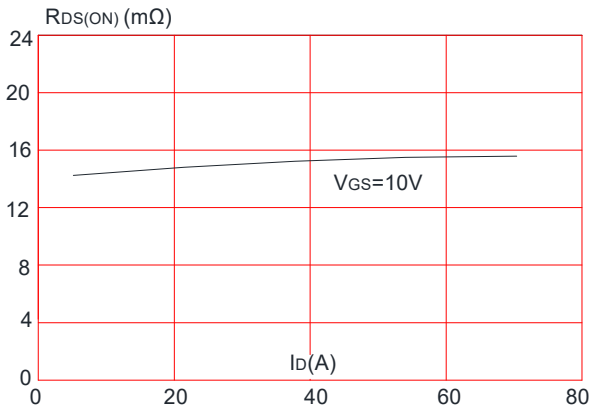


Figure 4: Body Diode Characteristics

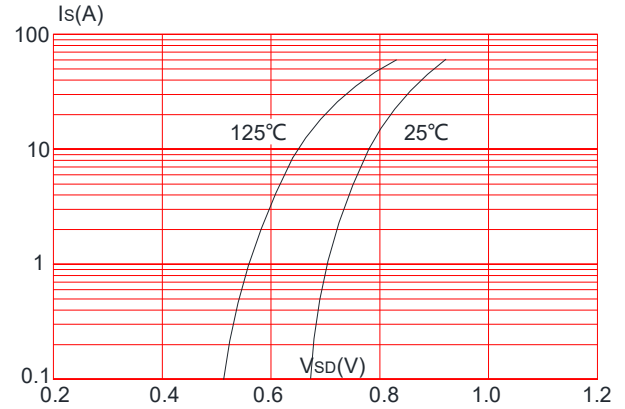


Figure 5: Gate Charge Characteristics

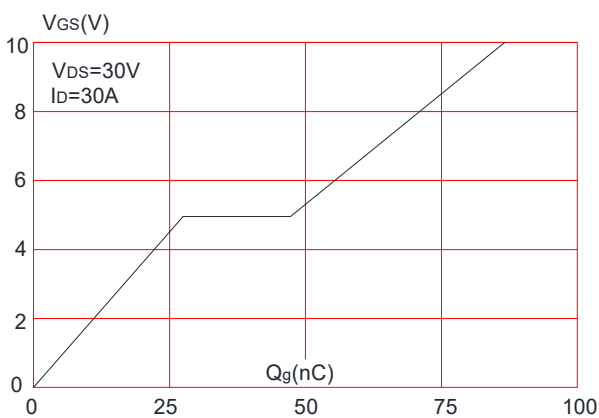
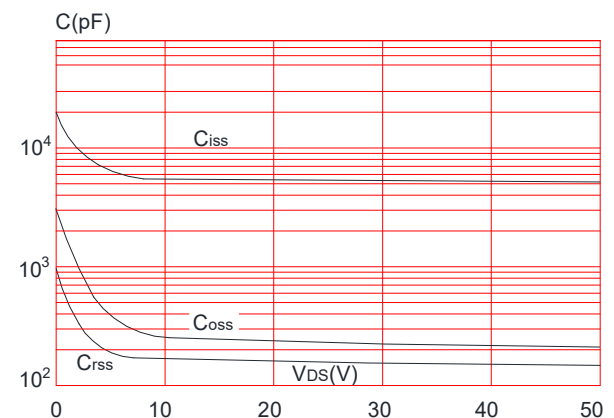


Figure 6: Capacitance Characteristics





JMTK170N10A

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

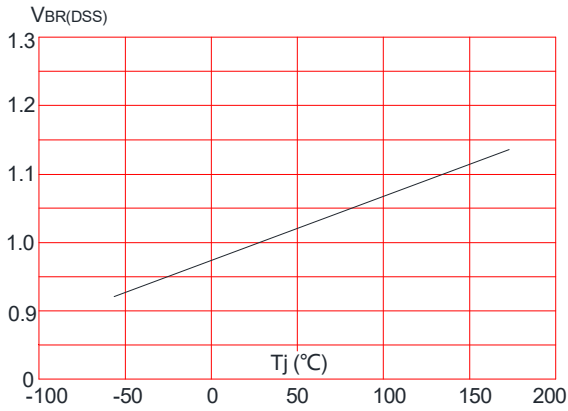


Figure 8: Normalized on Resistance vs. Junction Temperature

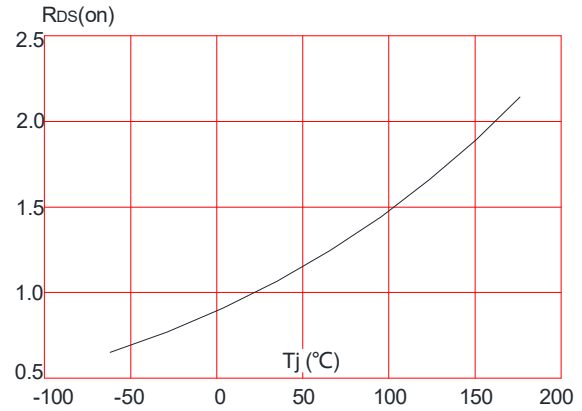


Figure 9: Maximum Safe Operating Area

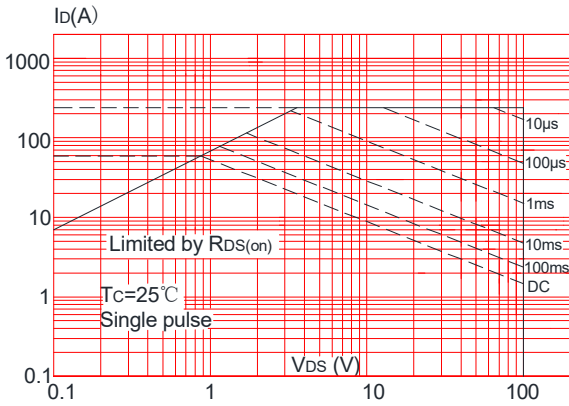


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

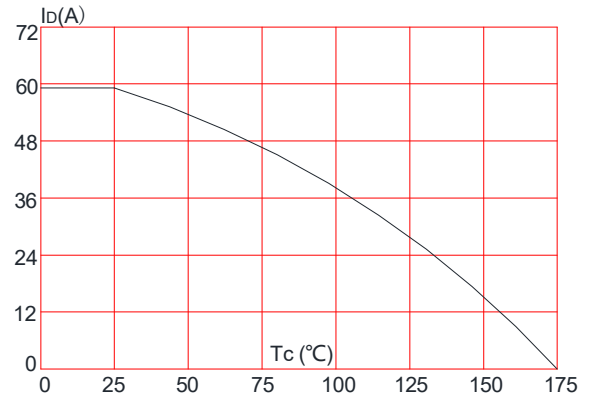
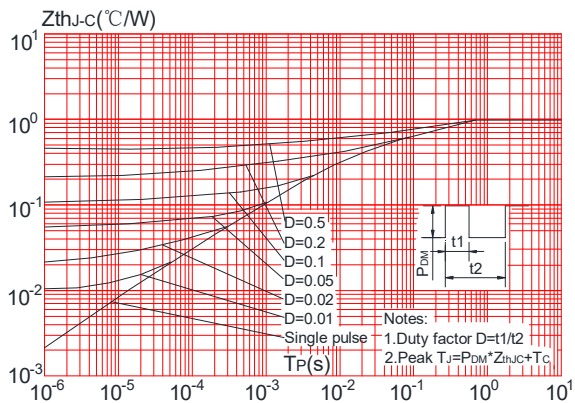


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

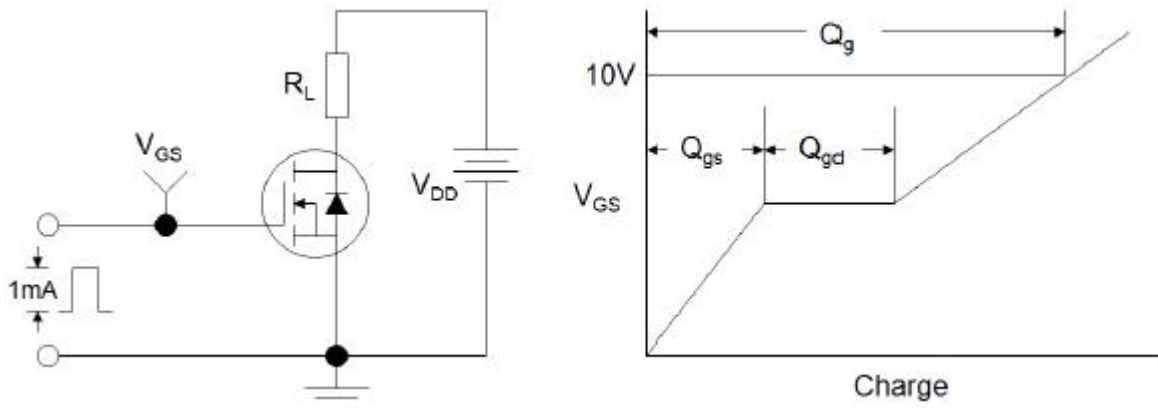


Figure1:Gate Charge Test Circuit & Waveform

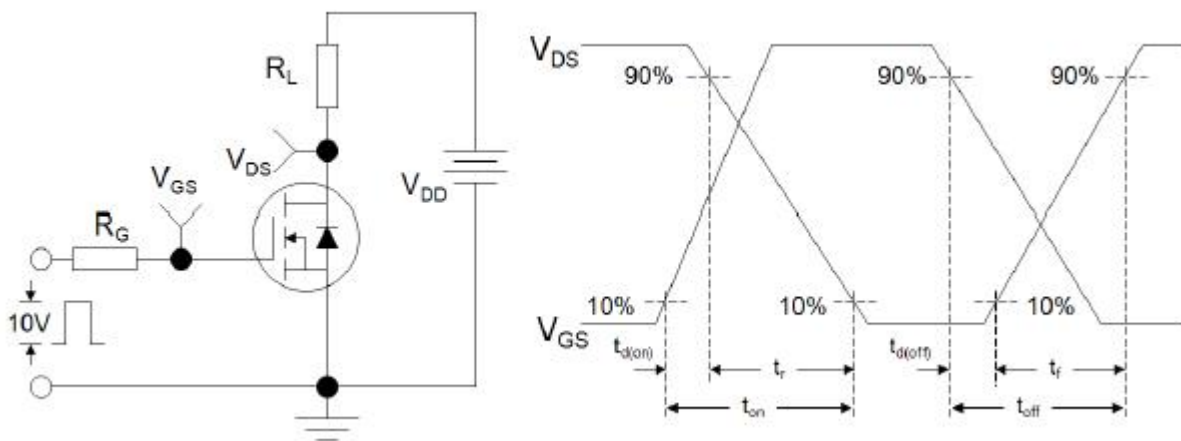


Figure 2: Resistive Switching Test Circuit & Waveforms

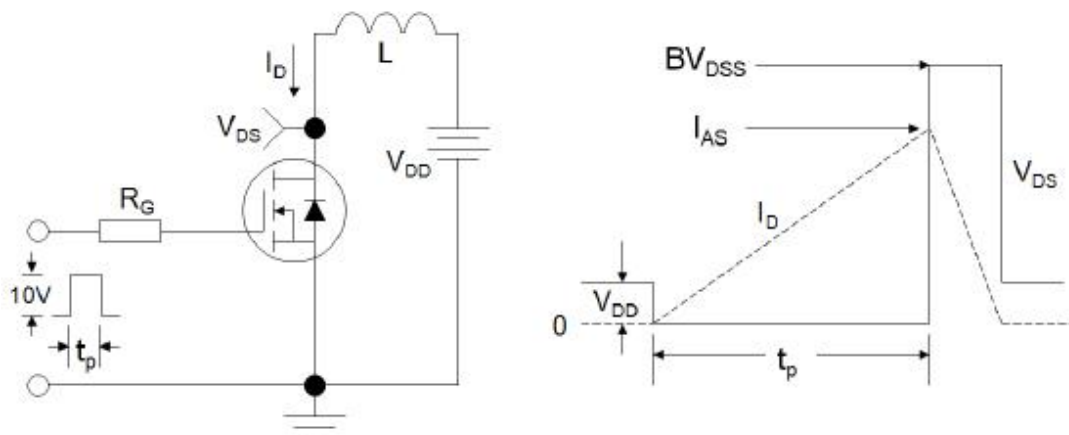
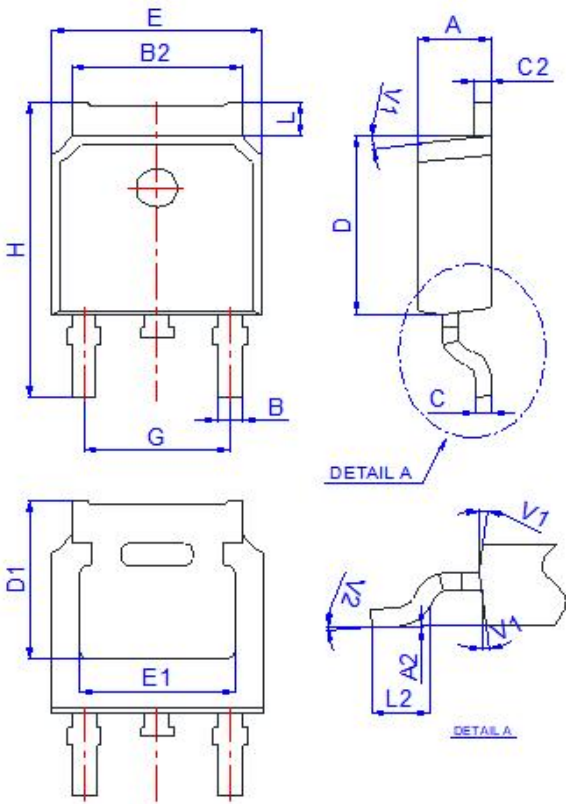


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

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