JMTL2N7002K

Description

JMT N-channel MOSFET

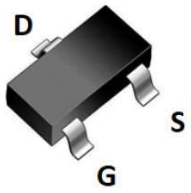
Features

- V_{DS}=60V, I_D=0.3A
  $R_{DS(ON)}$ <2.8Ω @ V_{GS} = 10V
  $R_{DS(ON)}$ <3.6Ω @ V_{GS} = 5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- ESD Protected: 2KV

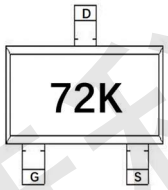
Application

- Battery Operated Systems
- Direct logic-level Interface: TTL/CMOS
- Solid-State Relays

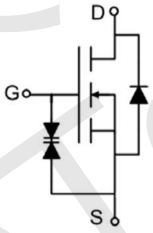
RoHS



SOT-23 top view



Marking and pin Assignment



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
72K	JMTL2N7002K	TAPING	SOT-23	-	-	-

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25℃	0.3	A
		T_A = 100℃	0.20	
I_{DM}	Pulsed Drain Current note1		1.2	A
P_D	Power Dissipation	T_A = 25℃	0.4	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		313	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Tony.Wang@ChipSourceTek.com InFo@ChipSourceTek.com

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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	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =60V, V_{GS} = 0V,	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±20V	-	-	±10	uA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= 250μA	1	1.4	1.9	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =10V, I_D =0.5A	-	1.1	2.8	Ω
		V_{GS} =4.5V, I_D =0.4A	-	1.3	3.6	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	21	-	pF
C_{oss}	Output Capacitance		-	11	-	pF
C_{rss}	Reverse Transfer Capacitance		-	4.2	-	pF
Q_g	Total Gate Charge	V_{DS} = 10V, I_D = 0.3A, V_{GS} = 4.5V	-	1.7	-	nC
Q_{gs}	Gate-Source Charge		-	0.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	0.6	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 30V, I_D =0.2A, R_{GEN} = 10Ω,V_{GS}=10V,	-	10	-	ns
t_r	Turn-on Rise Time		-	50	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	17	-	ns
t_f	Turn-off Fall Time		-	10	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	1.2	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =0.2A	-	-	1.2	V

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

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

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Typical Performance Characteristics

Figure1: Output Characteristics

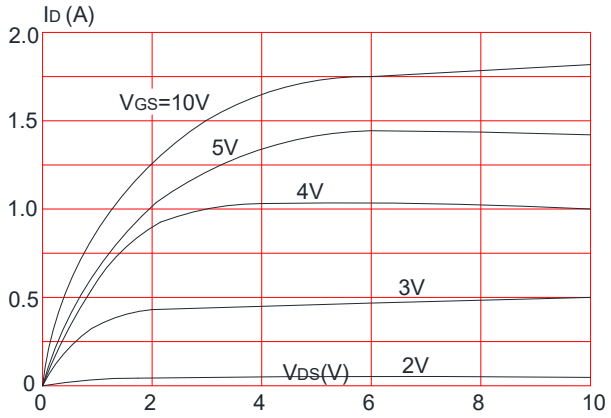

Figure 2: Typical Transfer Characteristics

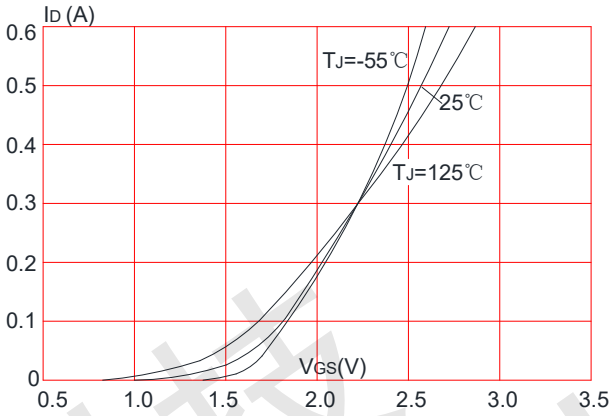

Figure 3: On-resistance vs. Drain Current

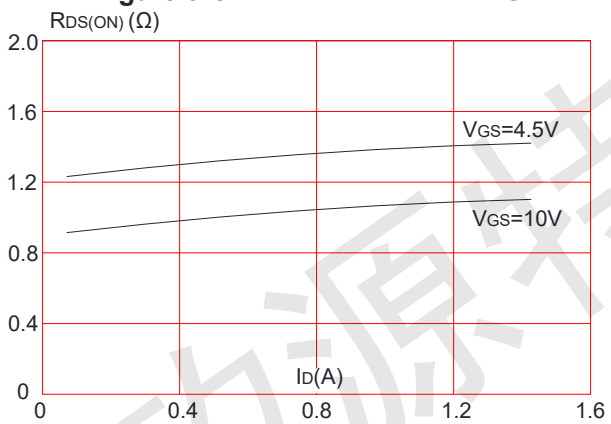

Figure 4: Body Diode Characteristics

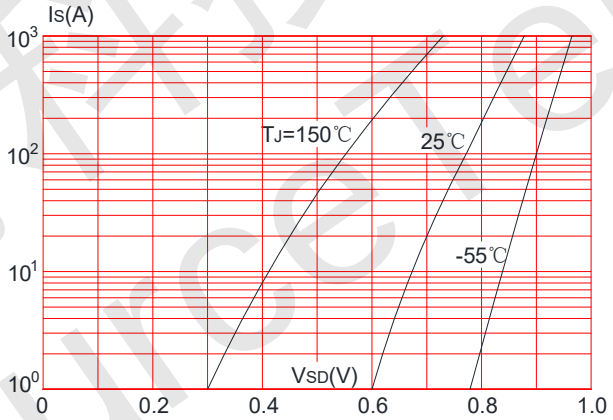

Figure 5: Gate Charge Characteristics

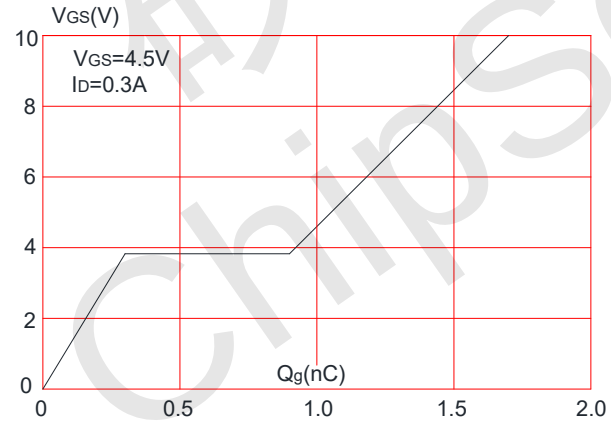

Figure 6: Capacitance Characteristics

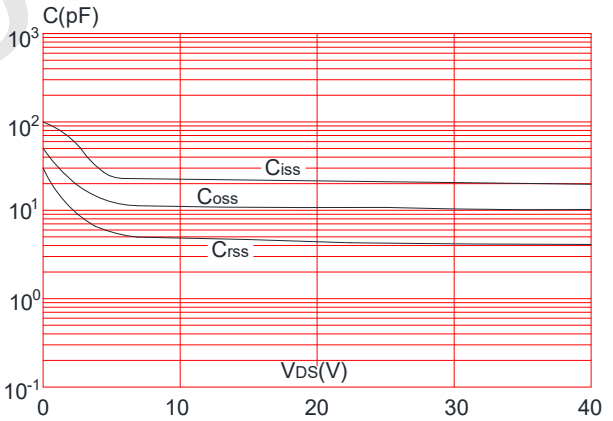

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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

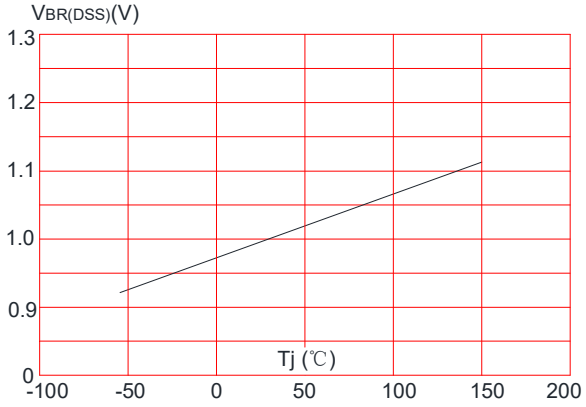


Figure 8: Normalized on Resistance vs. Junction Temperature

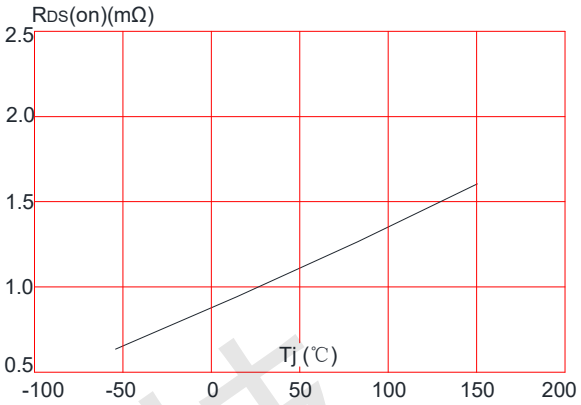


Figure 9: Maximum Safe Operating Area

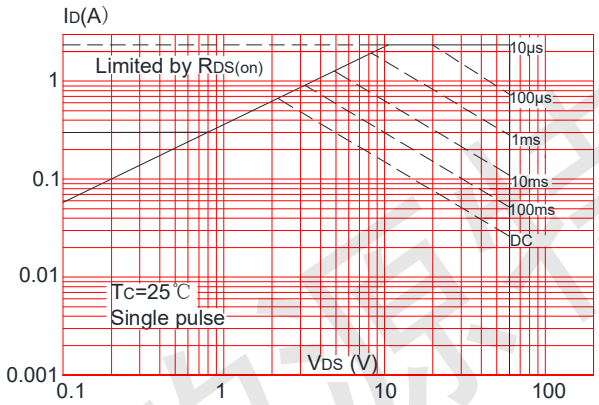


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

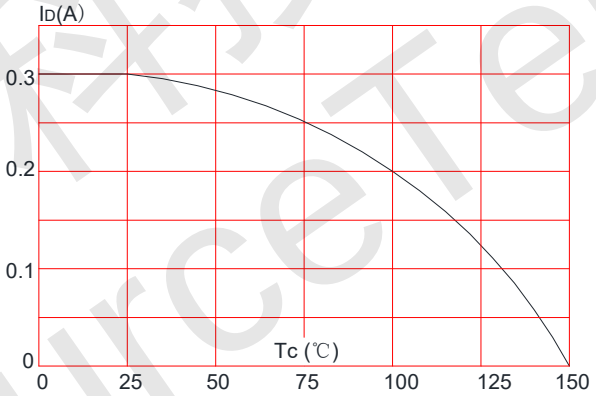
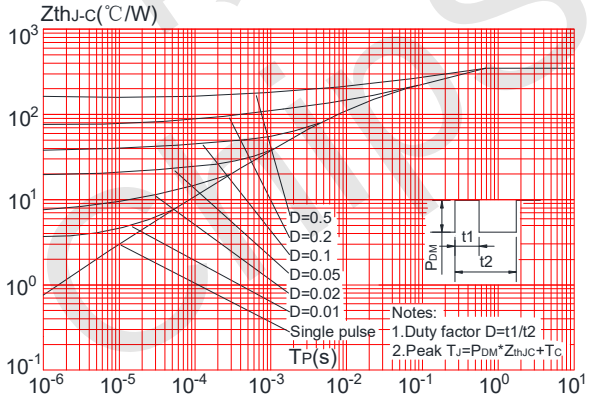


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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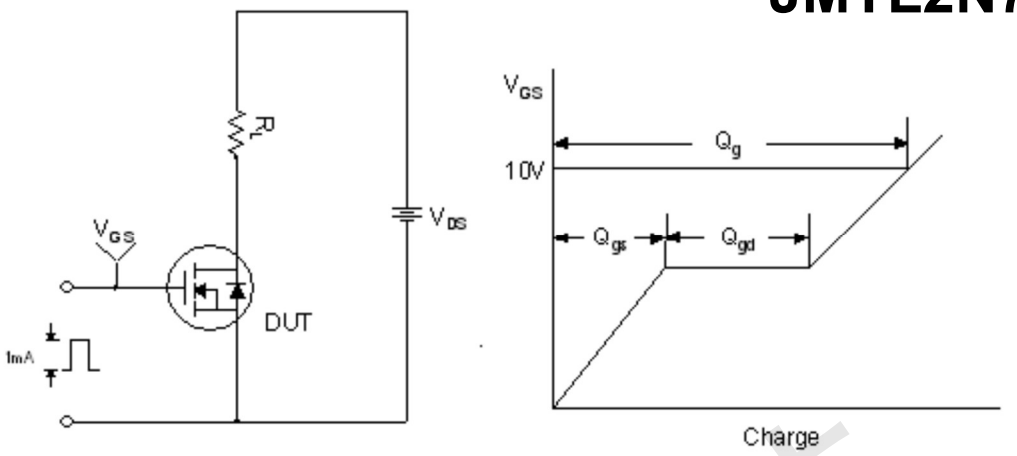

Figure 1. Gate Charge Test Circuit & Waveform

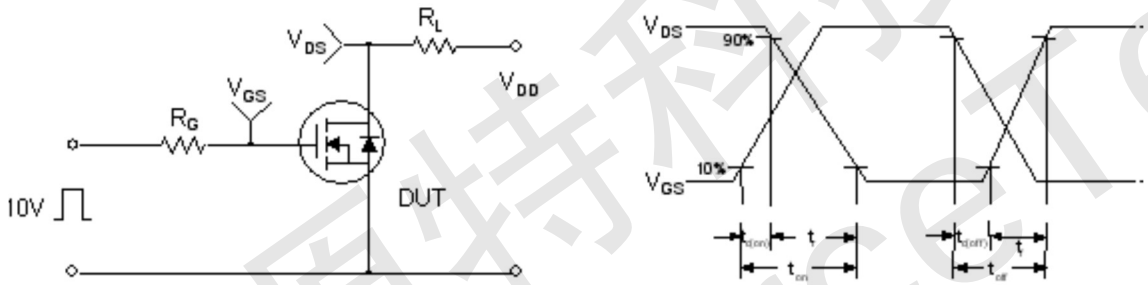

Figure 2. Resistive Switching Test Circuit & Waveforms

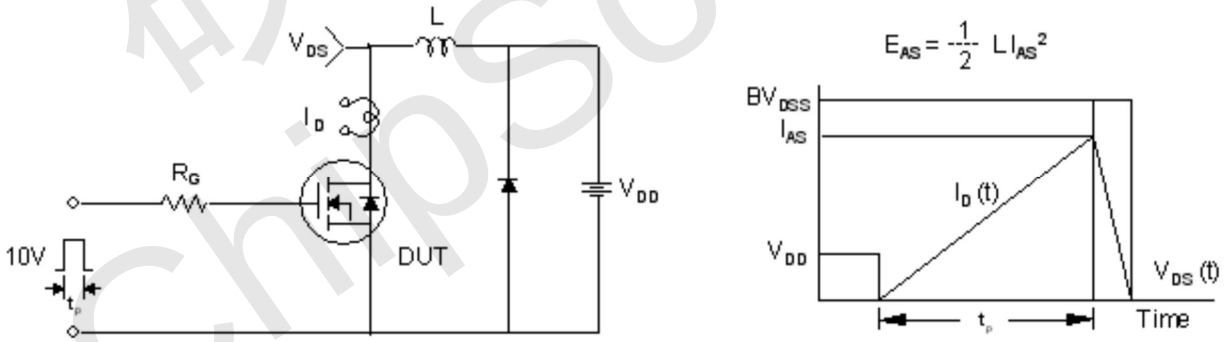

Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

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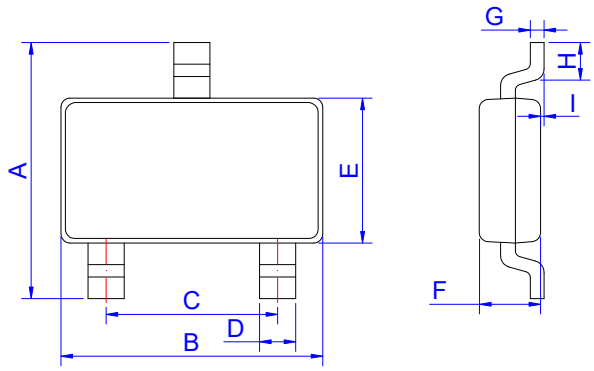
Package Mechanical Data



SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

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