

30V_{DS}/±20V_{GS} N-Channel Enhancement Mode MOSFET

Features

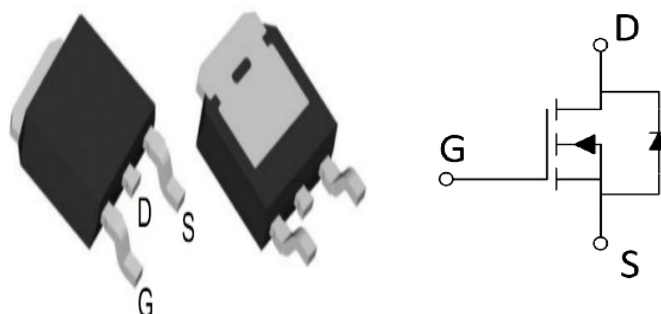
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

BVDSS	RDSON	ID
30V	10mΩ	50A

TO-252

Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion



Ordering Information

Device	package	Device Marking	Package Qty.
JMTK50N03A	TO-252	TK50N03A	2500/PCS

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V _{GS} =0V)	V _{DS}	30	V
Gate-Source Voltage (V _{GS} =0V,static)	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	50	A
Continuous Drain Current (T _C =100°C)		33	A
Pulsed Drain Current	I _{DM}	115	A
Maximum Power Dissipation	P _D	37	W
Single pulse avalanche energy	E _{as}	24	mJ
Operating,Storage Temperature Range	T _J ,T _{STG}	-55~175	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	R _{θJC}	-	2.5	-	°C/W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	3	V
Drain-Source On-stage Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	7.5	10	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	11	17	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1MHz$	-	940	-	pF
Output capacitance	C_{oss}		-	131	-	
Reverse transfer capacitance	C_{rss}		-	109	-	
Gate Resistance	R_g	$f=1MHz$	-	1.5	-	Ω
Total Gate Charge	Q_g	$V_{DS}=15V$ $V_{GS}=10V$ $I_D=20A$	-	70	-	nC
Gate Source Charge	Q_{gs}		-	4.8	-	
Gate Drain Charge	Q_{gd}		-	16.3	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=15V$ $R_L=0.75\Omega$ $R_G=3\Omega$	-	11	-	ns
Rise time	t_r		-	16	-	
Turn-off delay Time	$t_{d(off)}$		-	42	-	
Fall time	t_f		-	16	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=1A$	-	0.85	1.2	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=20A$ $dI/dt=500A/\mu s$	-	22	-	ns
Reverse Recovery Charge	Q_{rr}		-	11	-	nC

Electrical Characteristics Diagrames

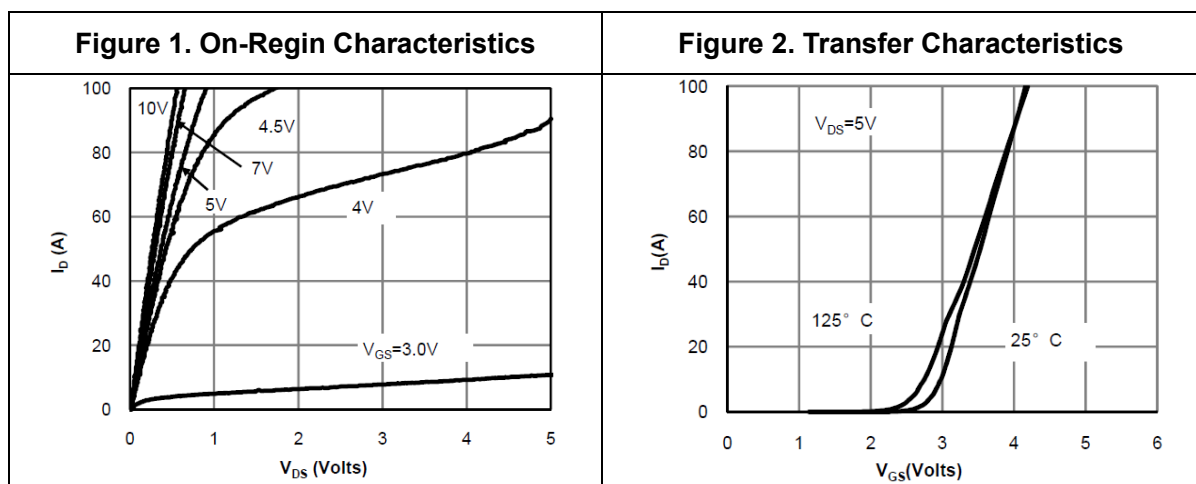


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

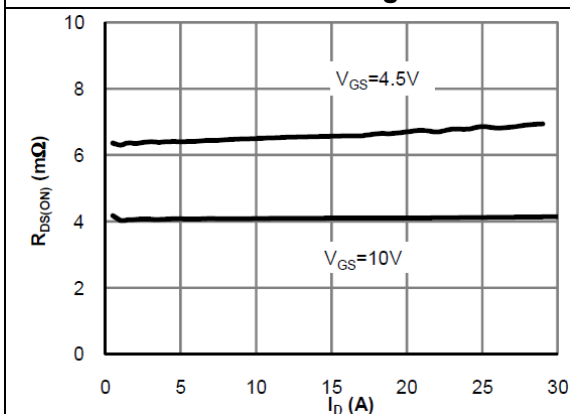


Figure 4. On-Resistance vs. Junction Temperature

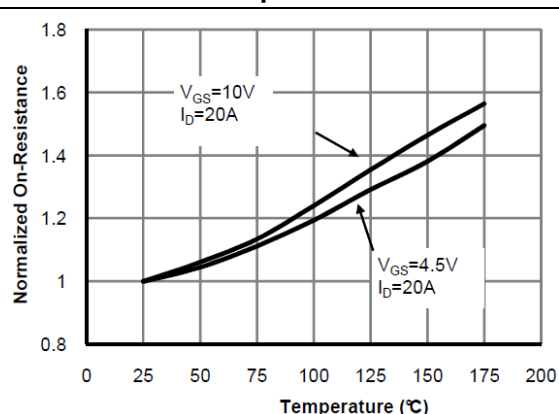


Figure 5. On-Resistance vs. Gate-Source Voltage

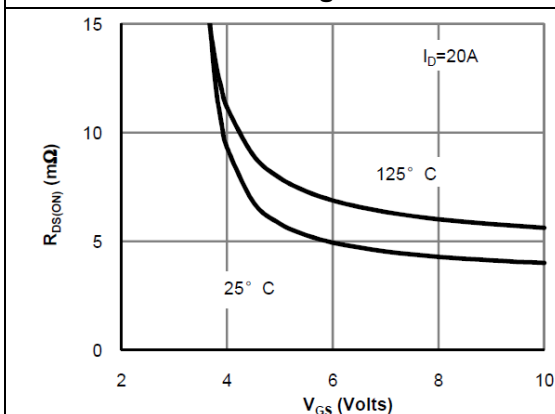


Figure 6. Body-Diode Characteristics

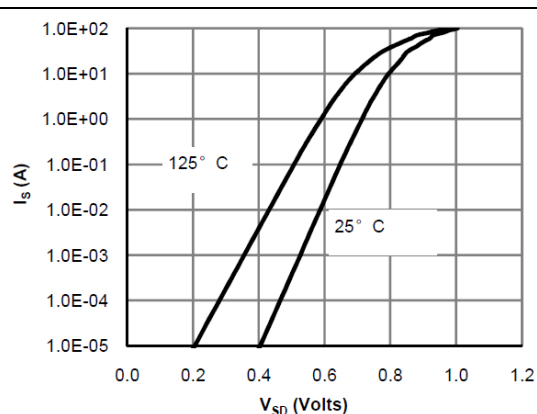


Figure 7. Gate-Charge Characteristics

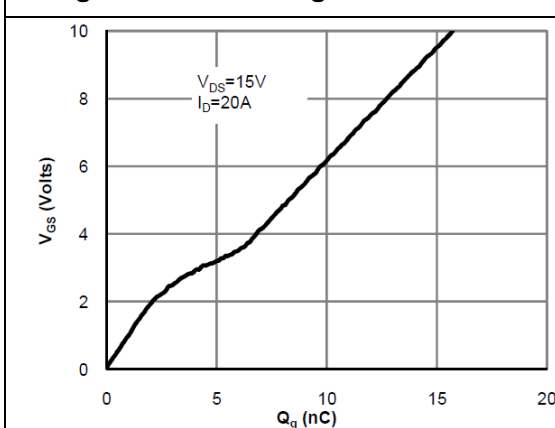


Figure 8. Capacitance Characteristics

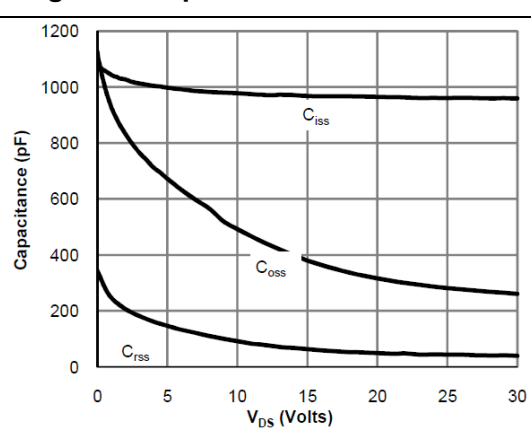


Figure 9. Maximum Forward Biased Safe Operating Area

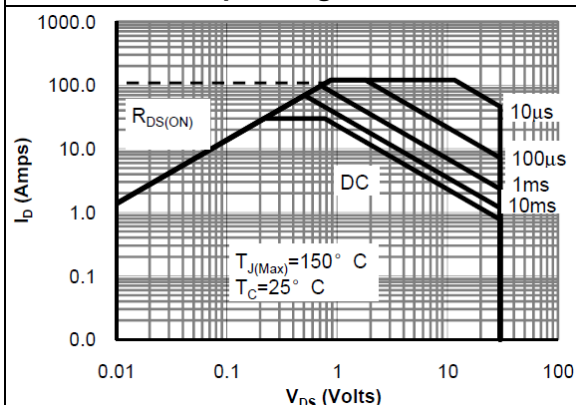


Figure 10. Single Pulse Power Rating Junction-to-Case

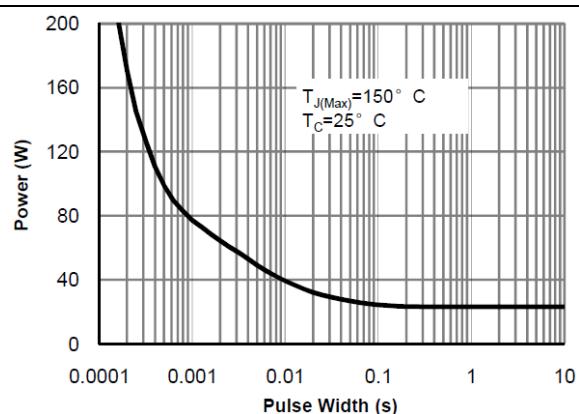
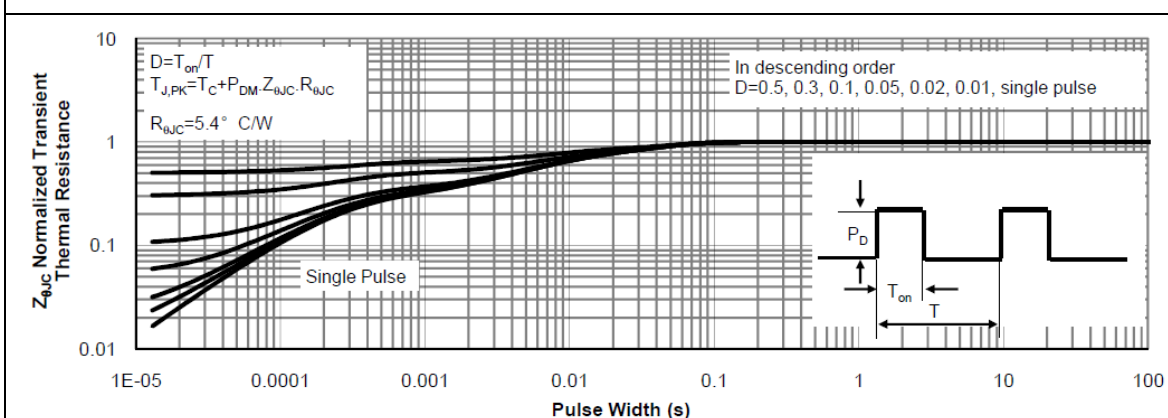


Figure 11. Normalized Maximum Transient Thermal Impedance



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