KJ053N10D

N-Channel Enhancement Mode MOSFET

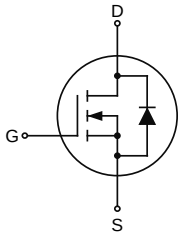
1. Product Information

1.1 Features

Spilt Gate Trench Technology

Excellent $R_{DS(ON)}$

Low gate charge



1.2 Applications

DC-DC Converter

Load Switch for Portable Device

Battery Switch

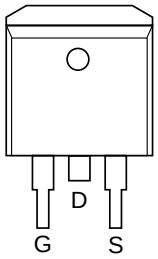
Rectifier

1.3 Quick reference

$BV \geqq 100V$

$I_D \leqq 120A$

$R_{DS(ON)} \leqq 5.4m\Omega @ V_{GS} = 10V$（Type:4.5mΩ）



Top View
TO-263

2. Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ053N10D	TO-263	053N10 YWWXXX YWWXXX: Date Code	-	-	800

3. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current V_{GS} @ 10V	120	A
I_D@T_A=100℃	Continuous Drain Current V_{GS} @ 10V	84	A
I_{DM}	Pulsed Drain Current [1]	440	A
E_{AS}	Single Pulse Avalanche Energy [2]	225	mJ
P_D	Power Dissipation	192	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	–55~150	℃
$R_{\theta JC}$	Thermal Resistance Junction-Case	0.65	℃/W

4. Electrical Characteristics (T_A=25℃ unless otherwise specified)

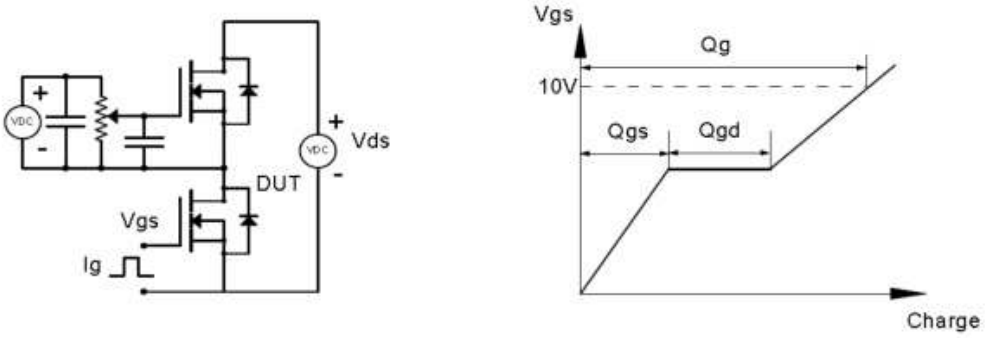
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage [3]	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$	Drain-Source On-State Resistance [3]	V_{GS}=10V, I_D=20A	-	4.5	5.4	mΩ
R_G	Gate Resistance	Frequency=1.0MHz	-	3.5	-	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V Frequency=1MHz	-	3244	-	pF
C_{oss}	Output Capacitance		-	1075	-	
C_{rss}	Reverse Transfer Capacitance		-	52	-	
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V, R_L=2.5Ω V_{GS}=10V, R_G=6Ω	-	22	-	ns
t_r	Turn-on Rise Time		-	36	-	
$t_{d(off)}$	Turn-off Delay Time		-	49	-	
t_f	Turn-off Fall Time		-	31	-	
Q_g	Total Gate Charge	V_{DS}=50V, I_{DS}=20A V_{GS}=10V	-	51	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	
Q_{gd}	Gate-Drain Charge		-	13	-	
Source-Drain Diode Characteristics						
V_{DS}	Diode Forward Voltage [3]	V_{GS}=0V, I_S=20A	-	-	1.2	V
I_S	Diode Forward Current [4]		-	-	120	A
t_{rr}	Reverse Recovery Time	I_S=15A, V_{GS}=0V dI_F/dt=100A/μs	-	58	-	ns
Q_{rr}	Reverse Recovery Charge		-	90	-	nC

Notes:

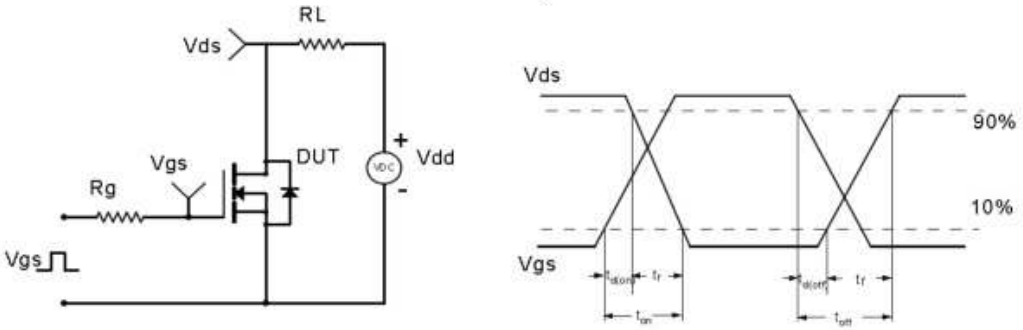
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. E_{AS} condition: T_J=25℃, V_{DD}=50V, R_G=25Ω, L=0.5mH
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4. Surface Mounted on FR-4 Board, t ≤ 10 sec

5. Test Circuit & Waveform

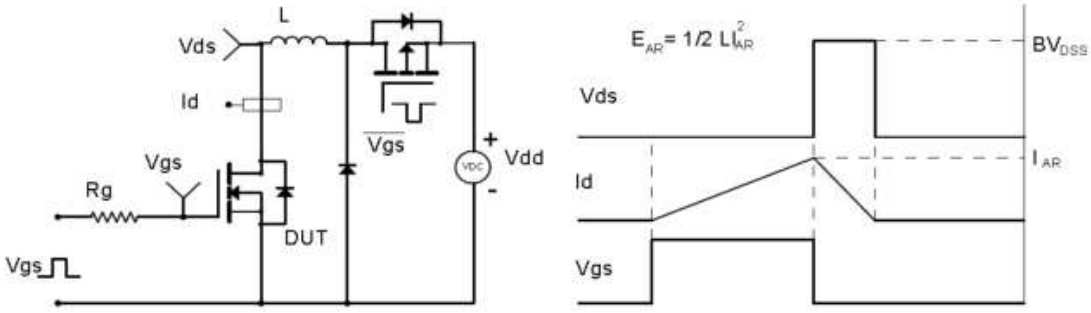
Gate Charge Test Circuit & Waveform



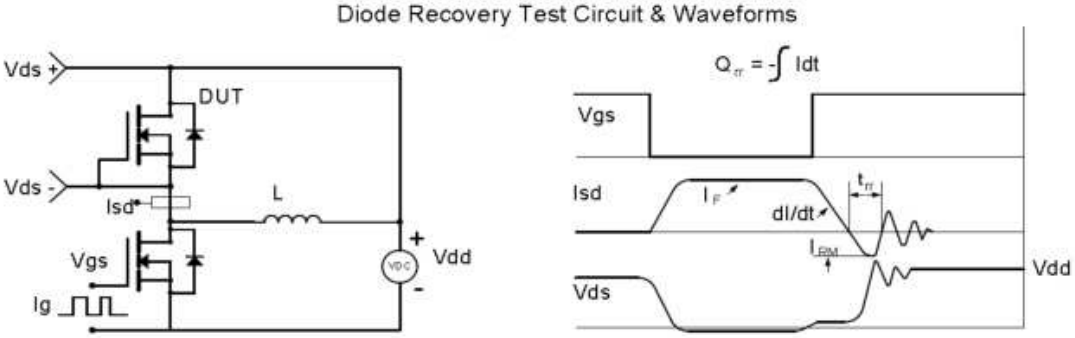
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



6. Typical Characteristics

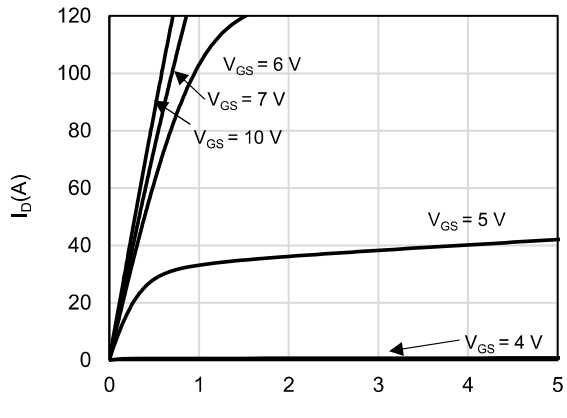


Figure 1: On-Region Characteristics

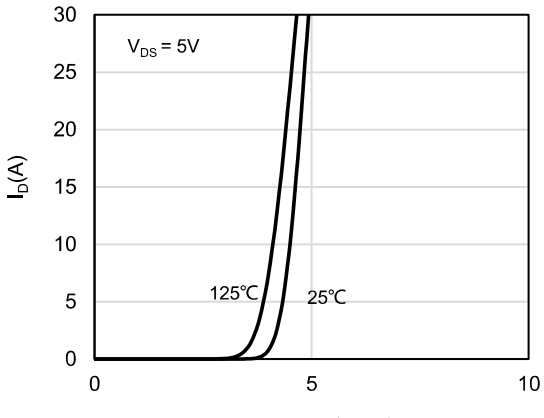


Figure 2: Transfer Characteristics

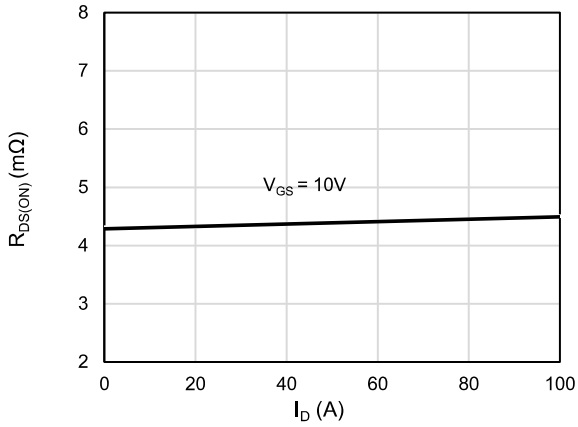


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

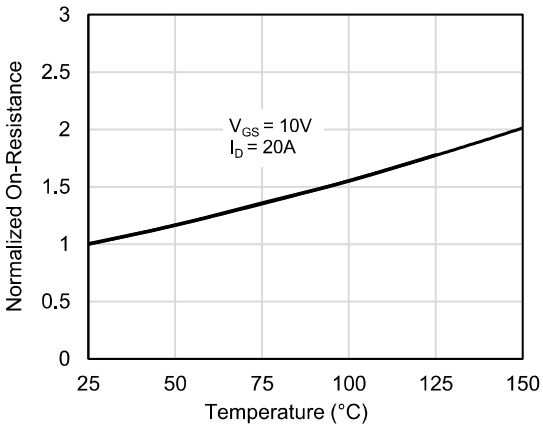


Figure 4: On-Resistance vs. Junction Temperature

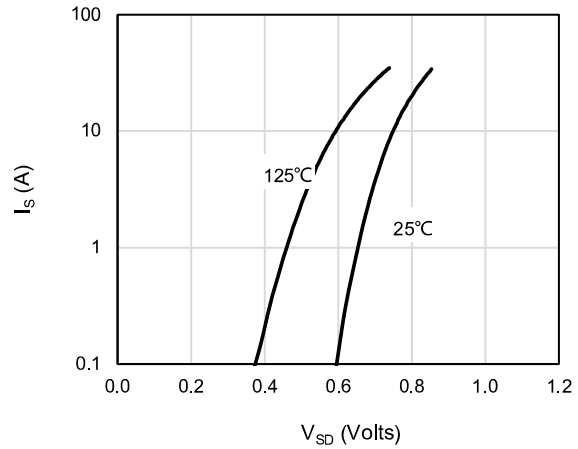


Figure 5: Body-Diode Characteristics

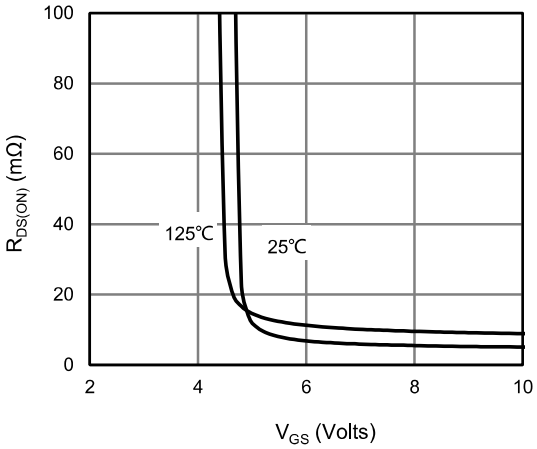


Figure 6: On-Resistance vs. Gate-Source Voltage

6. Typical Characteristics (cont.)

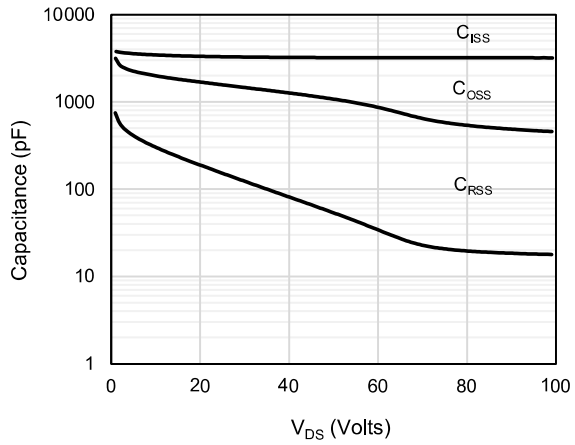


Figure 7: Capacitance Characteristics

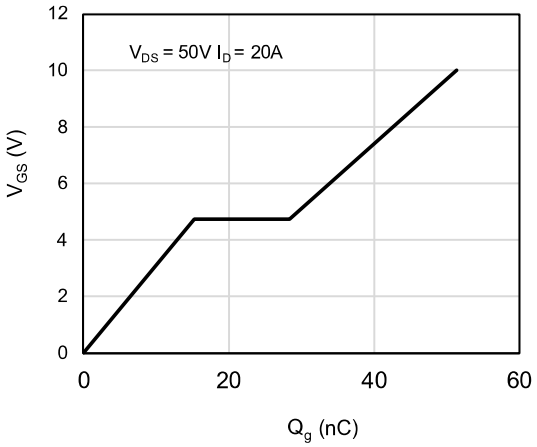


Figure 8: Gate-Charge Characteristics

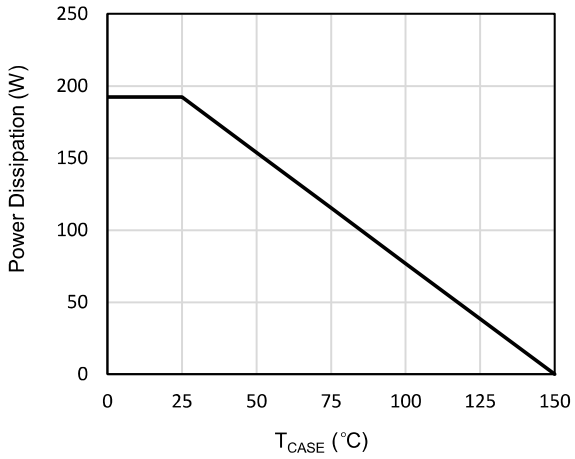


Figure 9: Power De-rating

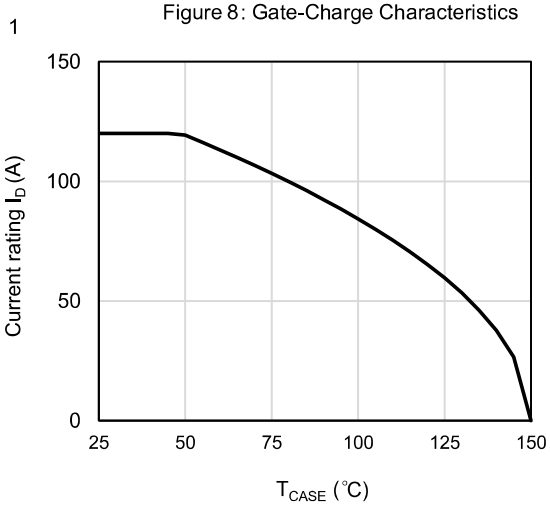


Figure 10: Current De-rating

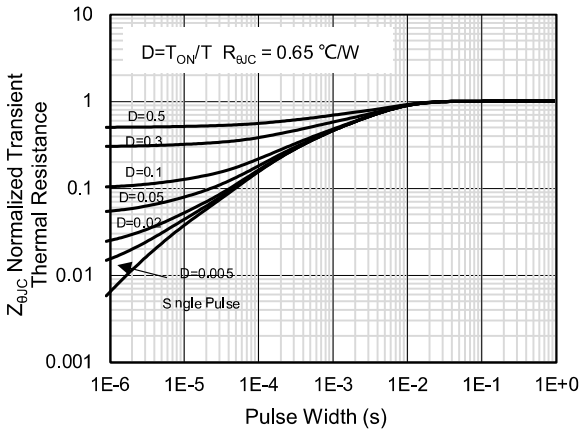


Figure 11: Normalized Maximum Transient Thermal Impedance

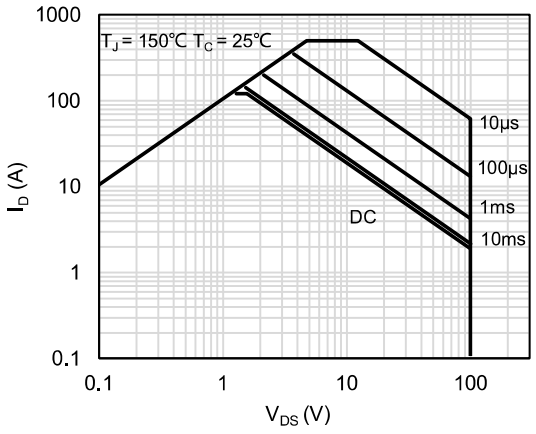
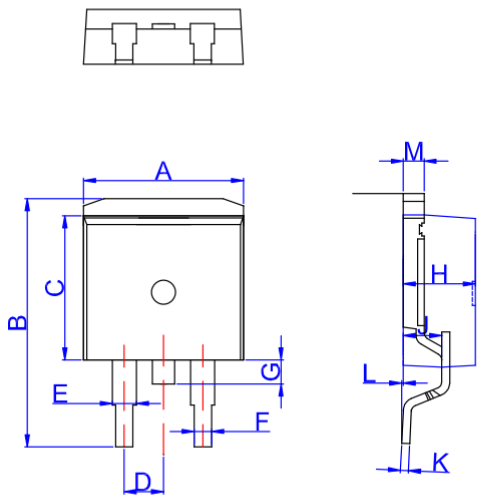


Figure 12: Maximum Forward Biased Safe Operating Area

7. Package Dimensions

TO-263 Package



TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053