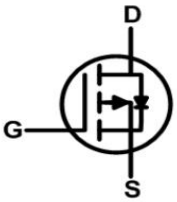
GENERAL DESCRIPTION

The RZC6103D is the high cell density trenched P-Channel MOSFET, which provide excellent RDS（ON）and gate charge for most of the synchronous buck converter applications.

The RZC6103D meet the RoHS and Green Product requirement with full function reliability approved.

PIN CONFIGURATION



FEATURES

- -60V/-18A, $R_{DS(ON)}$ =65mΩ V_{GS} = 10V (TYP.)
- -60V/-18A, $R_{DS(ON)}$ =95mΩ V_{GS} = 4.5V (TYP.)
- 100% EAS Guaranteed
- Green Device Available
- Supper Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology
- TO-252 package design

APPLICTIONS

- Load Switch
- Battery Powered System
- Hard Switch and High Frequency Circuits
- UPS.

ORDERING INFORMATION

Part Number	Package	Top Marking	Packing
RZC6103D	TO-252	D6103	2500PCS/Tape&Real

MAXIMUM RATINGS (Ta = 25℃)

Parameter	Symbol		Value	Units
Drain to Source Voltage	V_{DSS}		-60	V
Gate to Source Voltage	V_{GSS}		±20	V
Continuous Drain Current	25℃	I_D	-18	A
	70℃		-11	A
Pulsed Drain Current (note 1)	$I_{D(pulse)}$		-36	A
Single Pulse Avalanche Energy	E_{AS}		35	mJ
Avalanche Current	I_{AS}		-26	A
Maximum Power Dissipation	25℃	P_D	34.7	W
Thermal Resistance,Junction to Case	$R_{\theta JC}$		62	℃/W
Thermal Resistance,Junction to Ambient	$R_{\theta JA}$		3.6	℃/W
Operating Junction Temperature	T_J		150	°C
Storage Temperature	T_{STG}		-55-+150	°C
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)	T_L		260	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

ELECTRICAL CHARACTERISTICS (TA = 25℃)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=-250uA	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-48V,V_{GS}=0V T_J=25°C			-1	uA
		V_{DS}=-48V,V_{GS}=0V T_J=55°C			-5	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Gate threshold voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	-2	-2.5	V
Drain to Source On-state Resistance(note 2)	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-12A		65	70	mΩ
		V_{GS}=-4.5V,I_D=-8A		95	105	mΩ
Input Capacitance	C_{ISS}	V_{DS}=-15V , V_{GS}=0V , f=1MHz		1447		pF
Output Capacitance	C_{OSS}			97		pF
Reverse Transfer Capacitance	C_{RSS}			70		pF
Total Gate Charge (-4.5V)	Q_G	V_{DD}=-48V , V_{GS}=-10V , I_D=-10A		9.86		nC
Gate-Source Charge	Q_{GS}			3.08		nC
Gate-Drain Charge	Q_{GD}			2.95		nC
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V, V_{GS}=-10V R_G=3.3Ω,I_D=-1A		28.8		nS
Rise Time	Tr			19.8		
Turn-Off Delay Time	$T_{d(off)}$			60.8		
Fall Time	Tf			7.2		
Drain-Source Diode Forward Voltage	V_{SD}	Is=-1A,V_{GS}=0V, T_C=25℃		-0.9	-1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_D	T_C=25℃			-18	A
Maximum Pulse Drain-Source Diode Forward Current	I_{DSM}				-36	A

Note : 1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width≦300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-26.6A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

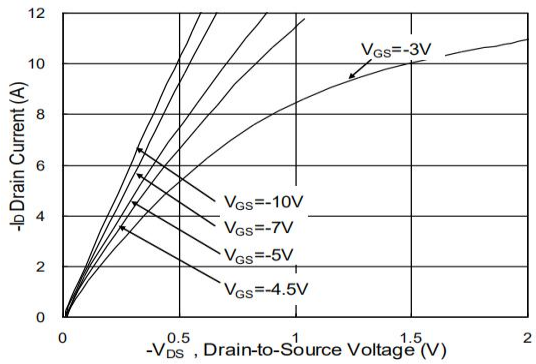


Fig 2. On-Resistance VS. VGS

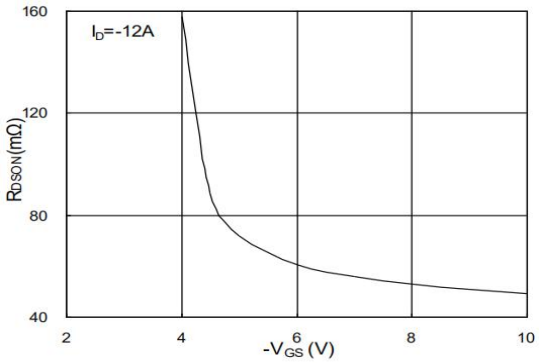


Fig 3. Forward Characteristics of Reverse

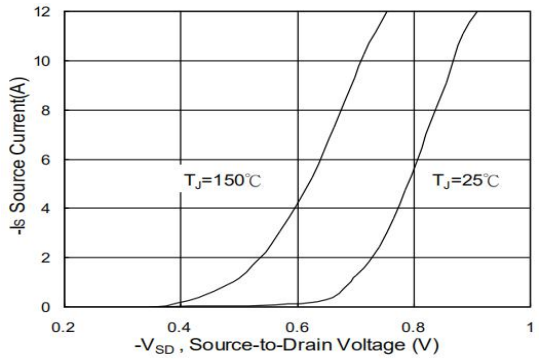


Fig 4. Gate-Charge Characteristics

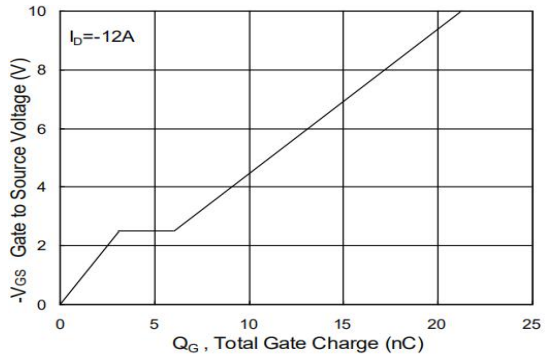


Fig.5 Normalized VGS(TH) VS. TJ

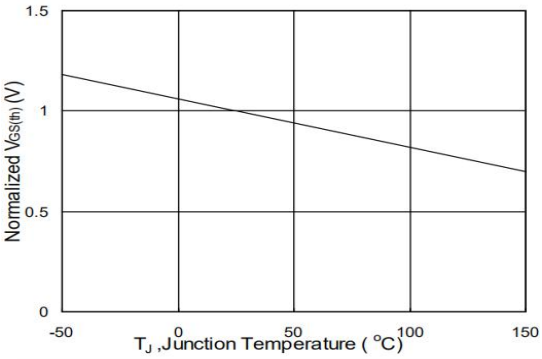


Fig.6 Normalized RDS(ON) VS. TJ

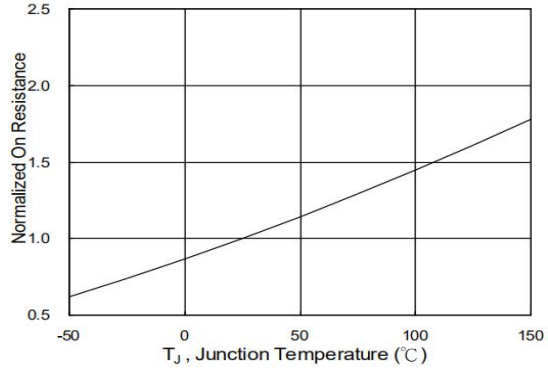


Fig.7 Capacitance

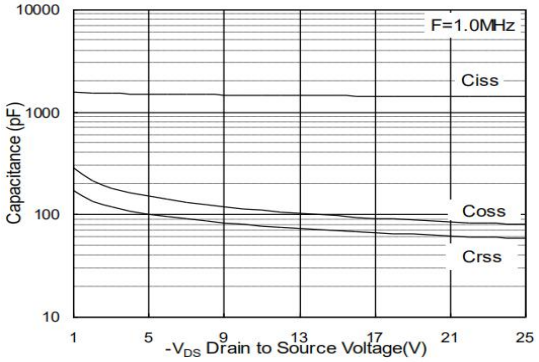


Fig.8 Safe Operation Area

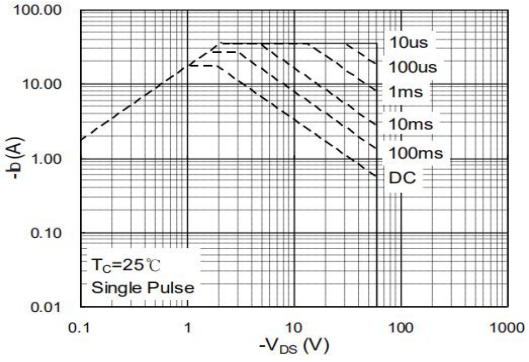
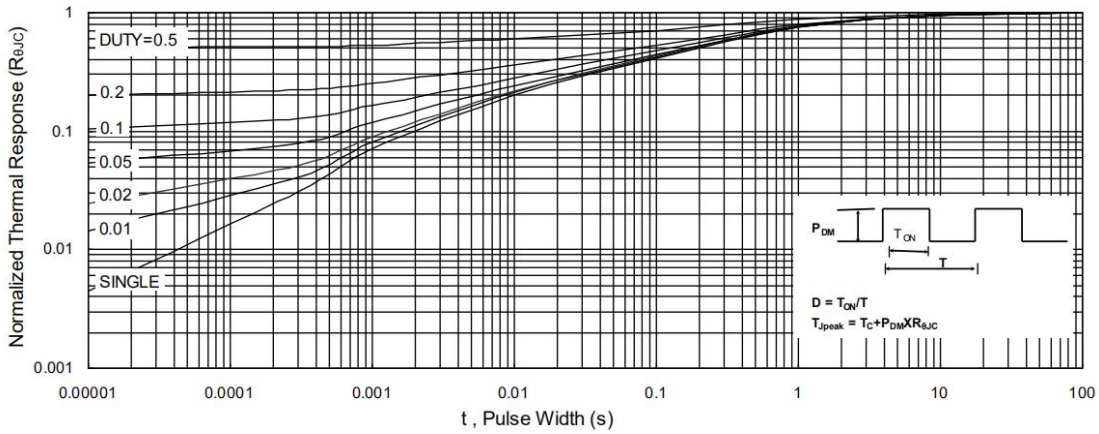
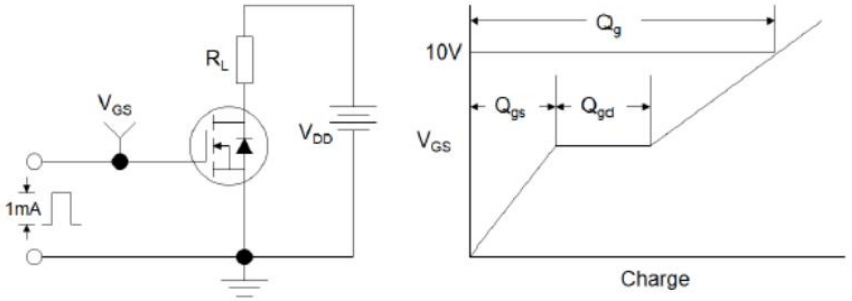


Fig.9 Maximum Effective Transient Thermal Impedance,Junction to Case

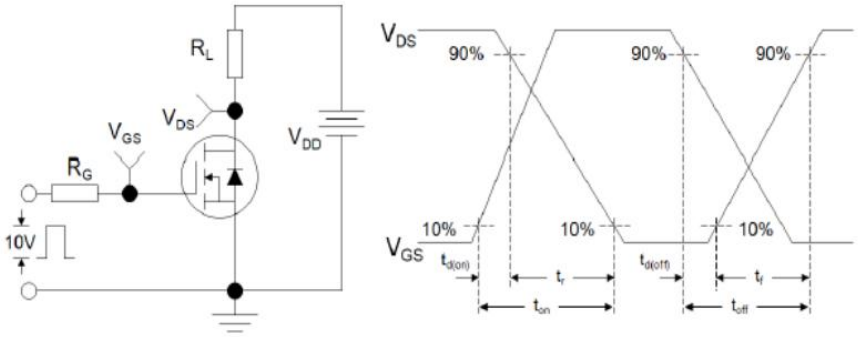


TEST CIRCUITS

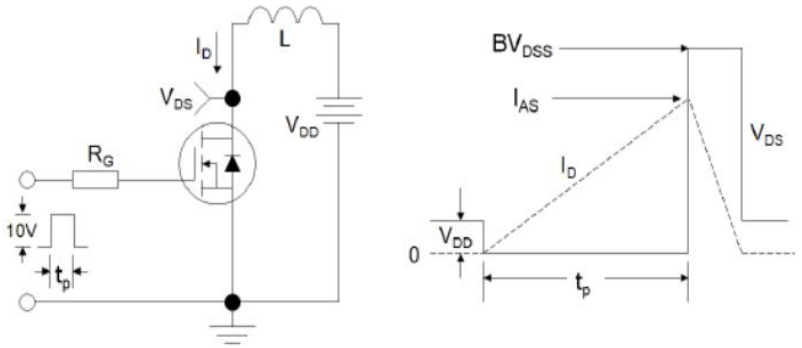
Gate Charge Test Circuit and Waveform



Resistive Switching Test Circuit and Waveform

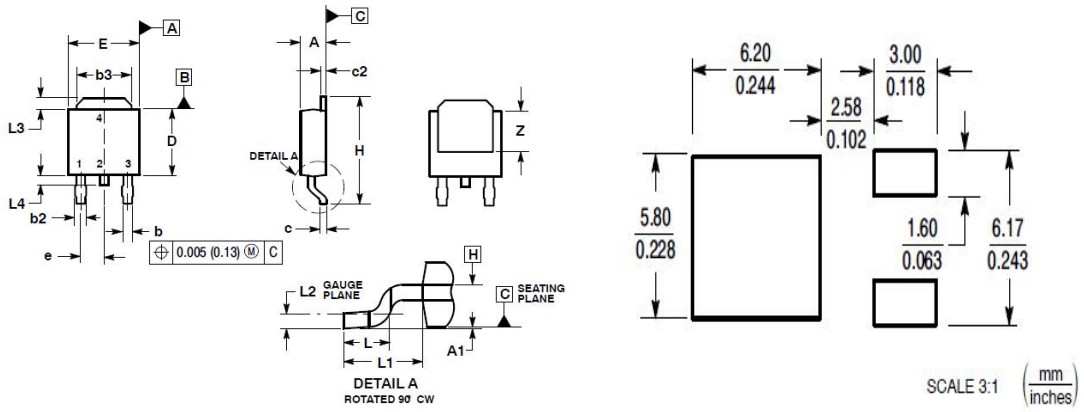


Unclamped Inductive Switching Test Circuit and Waveform



PACKAGE DIMENSIONS

TO-252



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090 BSC		2.29 BSC	
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020 BSC		0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---