



## GENERAL DESCRIPTION

The RZC2023D is the high cell density trench N-Channel MOSFET, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The RZC2023D meet the ROHS and Green Product requirement with full function reliability approved.

## PIN CONFIGURATION



## FEATURES

- 40V/100A,  $R_{DS(ON)} = 3m\Omega$   $V_{GS} = 10V$  (TYP.)
- High Density Cell Design for Ultra Low  $R_{DS(ON)}$
- Full Characterized Avalanche Voltage and Current
- Good Stability and Uniformity with High EAS
- Excellent Package for Good Heat Dissipation
- Special Process Technology for High ESD Capability

## APPLICTIONS

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

## ORDERING INFORMATION

Part Number	Package	Top Marking	Packing
RZC2023D	TO-252	T2023	2500PCS/Tape&Real

**MAXIMUM RATINGS** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Value	Units	
Drain to Source Voltage	$V_{DSS}$	40	V	
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current	$25^\circ\text{C}$	$I_D$	100	A
	$70^\circ\text{C}$		80	A
Pulsed Drain Current (note 1)	$I_{D(pulse)}$	400	A	
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	125	mJ	
Maximum Power Dissipation	$25^\circ\text{C}$	$P_D$	65	W
Operating Junction Temperature	$T_J$	150	$^\circ\text{C}$	
Storage Temperature	$T_{STG}$	-55-+150	$^\circ\text{C}$	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	$T_L$	260	$^\circ\text{C}$	

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°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX	Units
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250uA	40			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 40V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C			1	uA
		V <sub>DS</sub> = 40V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			5	uA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Gate threshold voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.0	V
Drain to Source On-state Resistance <sub>(note 2)</sub>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> = 5.0A		3	5	mΩ
Forward Transconductance	g <sub>fs</sub>	I <sub>D</sub> =20A, V <sub>DS</sub> =5V	10			S
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =20V , V <sub>GS</sub> =0V , f=1MHz		5900		pF
Output Capacitance	C <sub>OSS</sub>			690		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			640		pF
Total Gate Charge (10V)	Q <sub>G</sub>	V <sub>DD</sub> =20V , V <sub>GS</sub> =10V , I <sub>D</sub> =40A		121		nC
Gate-Source Charge	Q <sub>GS</sub>			17		nC
Gate-Drain Charge	Q <sub>GD</sub>			35		nC
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, RL=1Ω RG=3Ω, I <sub>D</sub> =40A		28		nS
Rise Time	T <sub>r</sub>			68		
Turn-Off Delay Time	T <sub>d(off)</sub>			109		
Fall Time	T <sub>f</sub>			33		
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =40A, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C		0.9	1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I <sub>D</sub>	T <sub>C</sub> =25°C			100	A
Maximum Pulse Drain-Source Diode Forward Current	I <sub>DSM</sub>				400	A
Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> =40A, T <sub>J</sub> =25°C Di/Dt=100A/uS		39		nS
Reverse Recovery Charge	Q <sub>rr</sub>			41		nC

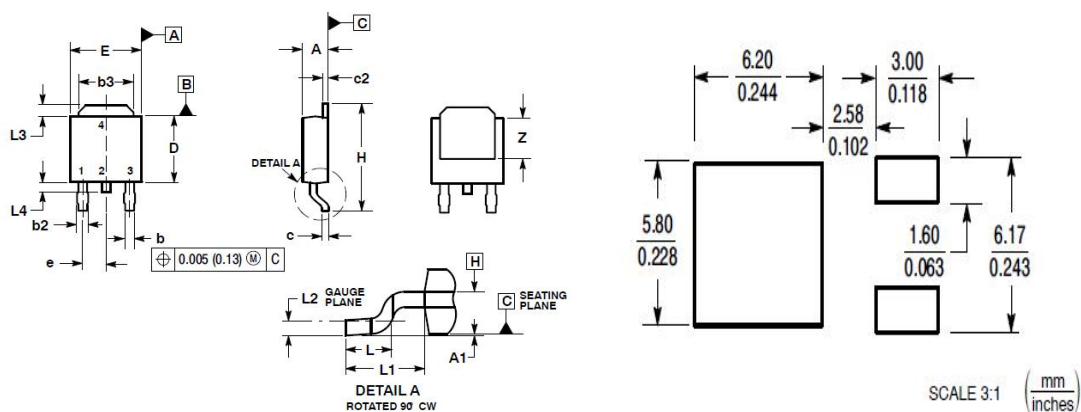
Note : 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse test: pulse width <= 300us, duty cycle <= 2%.



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	---