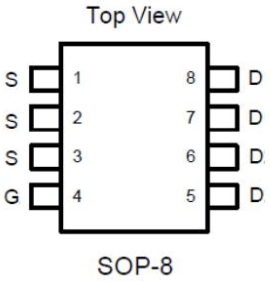
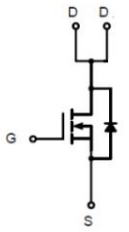
GENERAL DESCRIPTION

The RZC4004 is the high cell density trenched N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.
The RZC4004 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

PIN CONFIGURATION



SOP-8



N Channel

FEATURES

- 40V/10A, $R_{DS(ON)}$ =9.0mΩ VGS = 10V (TYP.)
- 40V/10A, $R_{DS(ON)}$ =14mΩ VGS = 4.5V (TYP.)
- 100% EAS Guaranteed
- Green Device Available
- Supper Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology
- SOP-8 package design

APPLICTIONS

- Power Management in Notebook Computer
- Portable Equipment
- Battery Powered Systems

ORDERING INFORMATION

Part Number	Package	Top Marking	Packing
RZC4004	SOP-8	S4004	3000PCS/Real

MAXIMUM RATINGS (Ta = 25℃)

Parameter	Symbol		Value	Units
Drain to Source Voltage	V_{DSS}		40	V
Gate to Source Voltage	V_{GSS}		±20	V
Continuous Drain Current	I_D	25℃	10	A
		70℃	8	A
Pulsed Drain Current	$I_{D(pulse)}$		34	A
Maximum Power Dissipation	$P_{D(25℃)}$		1.9	W
Single Pulse Avalanche Energy	E_{AS}		31	mJ
Operating Junction Temperature	T_J		+150	℃
Storage Temperature	T_{STG}		-55-+150	℃
Lead Temperature for Soldering Purposes(1/8″ from case for 10 s)	T_L		260	°C

ELECTRICAL CHARACTERISTICS (TA = 25℃)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=250uA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V T_J=25°C			1	uA
		V_{DS}=32V,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	1.0	1.5	2.5	V
Drain to Source On-state Resistance(note 2)	$R_{DS(ON)}$	V_{GS}=10V,I_D=8A		9	12	mΩ
		V_{GS}= 4.5V,I_D=6A		14	17	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1.2	V
Gate Resistance	Rg	V_{DS}=0V ,V_{GS}=0V , f=1MHz		2.1		Ω
Input Capacitance	C_{ISS}	V_{DS}=15V , V_{GS}=0V , f=1MHz		1314		pF
Output Capacitance	C_{OSS}			120		
Reverse Transfer Capacitance	C_{RSS}			88		
Total Gate Charge (10V)	Q_G	V_{DD}=20V , V_{GS}=4.5V , I_D=8A		10.7		nC
Gate-Source Charge	Q_{GS}			3.3		
Gate-Drain Charge	Q_{GD}			4.2		
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=12V, V_{GS}=10V R_G=3.3Ω,I_D=6A		8.6		nS
Rise Time	Tr			3.4		
Turn-Off Delay Time	$T_{d(off)}$			24.8		
Fall Time	Tf			2.2		

DIODE CHARACERISTICS

Parameter	Symbol	Test Conditions	MIN	TYP	MAX	Units
Drain-Source Diode Forward Voltage	V_{SD}	Is=1A,V_{GS}=0V			1.2	V
Continuous Source Current[1,5]	Is	V_G=V_D=0V, Force Current			10	A

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

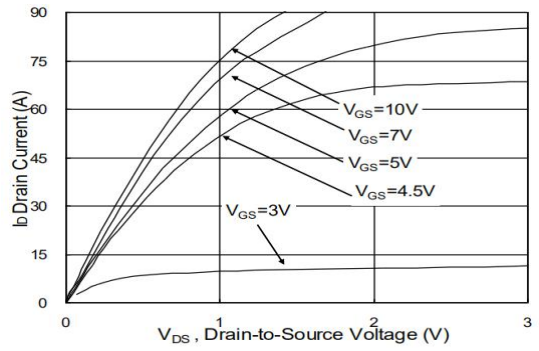


Fig 2. On-Resistance VS. VGS

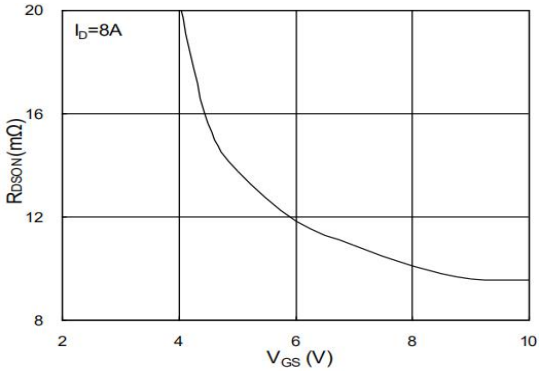


Fig 3. Forward Characteristics of Reverse

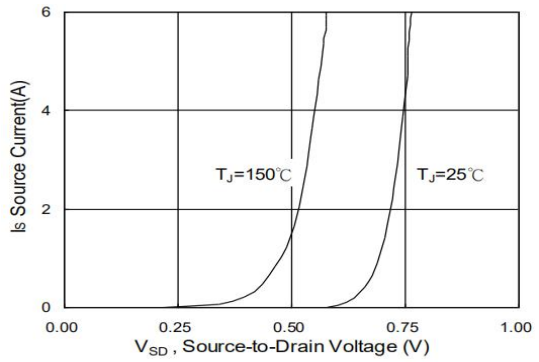


Fig 4. Gate-Charge Characteristics

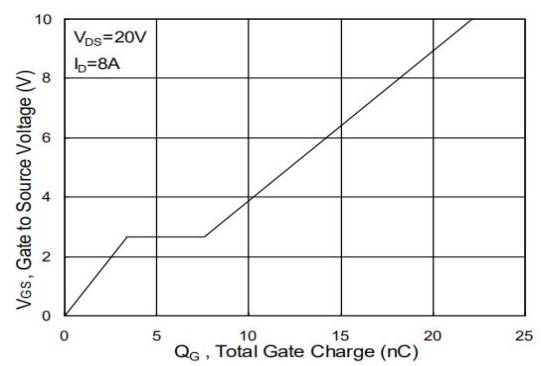


Fig.5 Normalized VGS(TH) VS. TJ

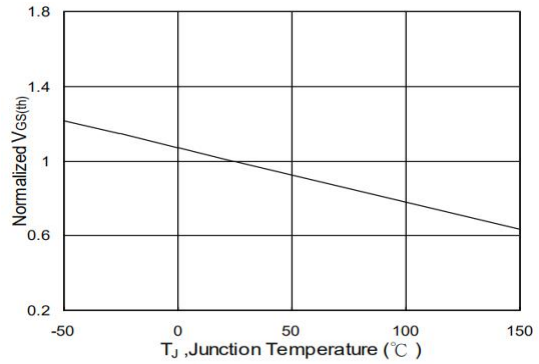


Fig.6 Normalized RDS(ON) VS. TJ

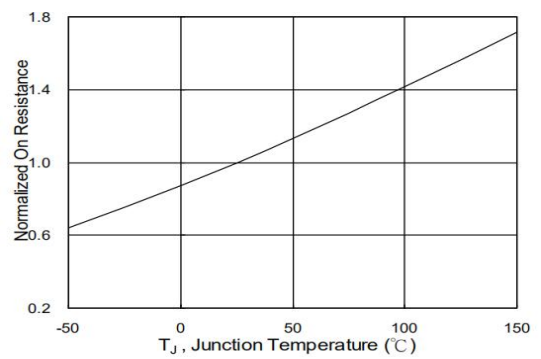


Fig.7 Capacitance

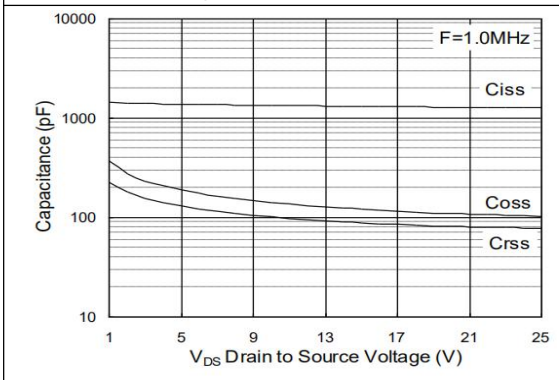


Fig.8 Safe Operation Area

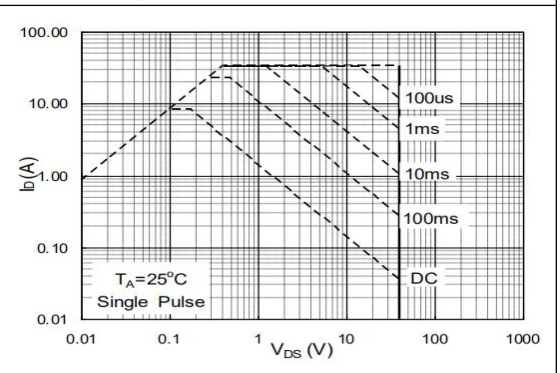
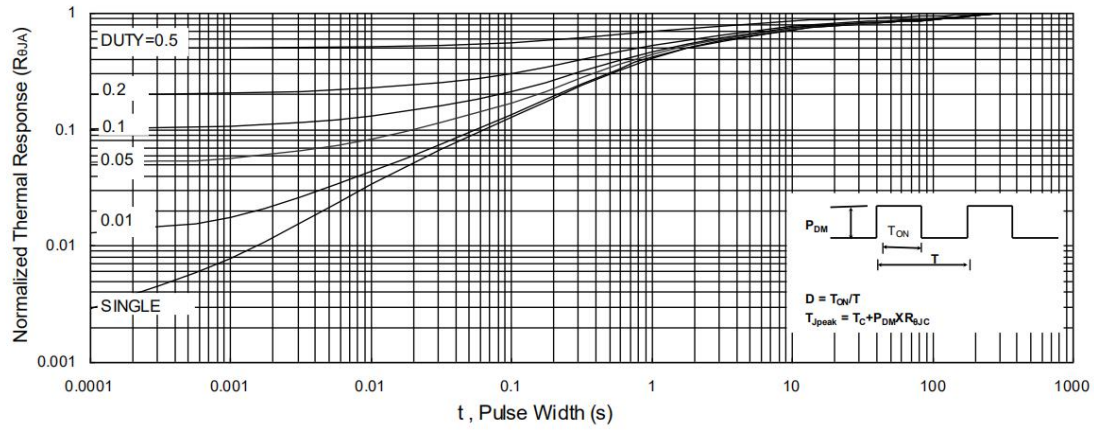
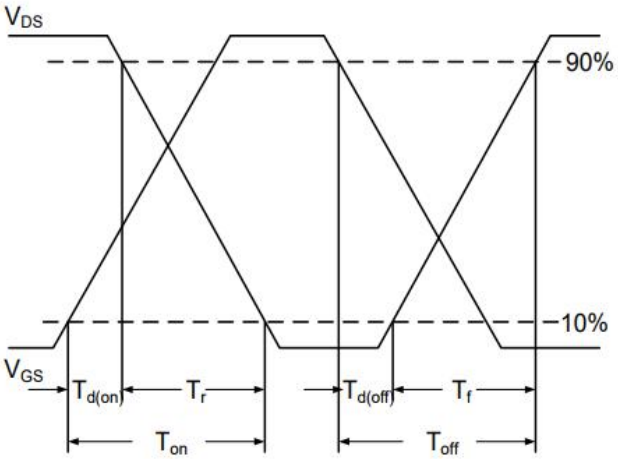


Fig.9 Normalized Maximum Transient Thermal Impedance

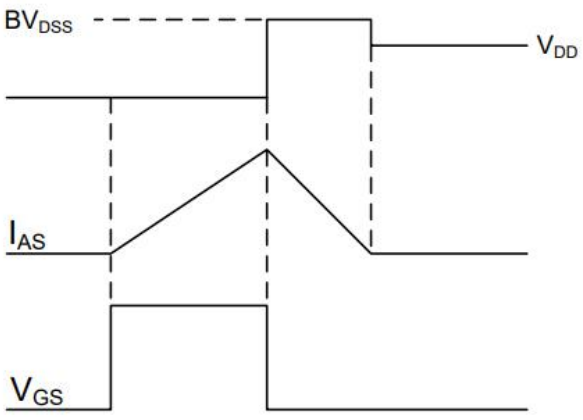


Switching Time Waveform



Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$



PACKAGE DIMENSIONS

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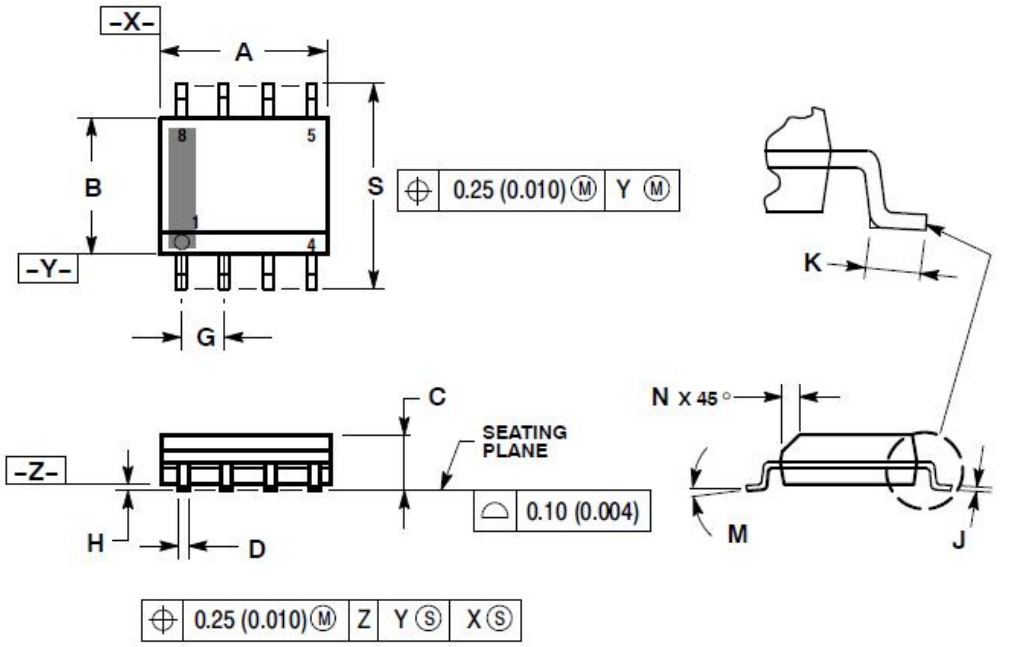
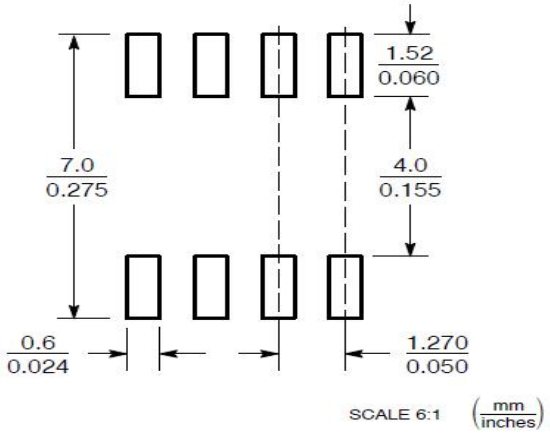


SOLDERING FOOTPRINT*



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0 °	8 °	0 °	8 °
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244