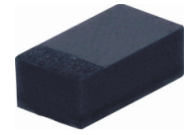


# SMD Zener Diode

## CZRFR52C2 Thru CZRFR52C39 (RoHS Device)

Voltage 2 to 39 Volts  
Power 200 mWatts

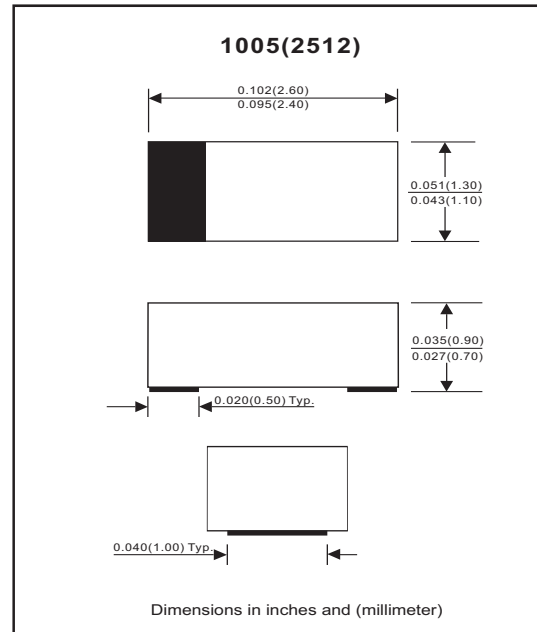


### Features

- 200mW Power Dissipation.
- High Voltages from 2 ~ 39 V.
- Designed for mounting on small surface.
- Extremely thin/leadless package.
- Pb free product.

### Mechanical data

- Case: 1005(2512) Standard package  
Molded plastic.
- Terminals: Gold plated, solderable per  
MIL-STD-750, method 2026.
- Polarity: Indicated by cathode band.
- Weight: 0.006 gram (approx.).



### Maximum Rating AND Electrical Characteristics

Parameter	Symbol	Value	Unit
Maximum Forward Voltage Drop at $I_F = 10 \text{ mA}$	$V_F$	0.9	V
Maximum Power Dissipation at $25^\circ\text{C}$	$P_D$	200	mW
Forward current, surge peak 8.3 ms single half sine-wave superimposed on rate load (JEDEC method)	$I_{FSM}$	2.0	A
Peak ESD voltage capability (IEC 61000-4-2)	$V_{PV}$	8	kV
Operating Junction and Storage Temperature Range	$T_J$	-55 to +125	$^\circ\text{C}$

## Electrical Characteristics (TA=25°C)

Part Number	Marking Code	Zener Voltage			Operating resistance		Rising operating Resistance		Reverse current	
		V <sub>Z</sub> (V)			ZZT(Ohm)		ZZK(Ohm)		IR(μA)	
		Min	Max	I <sub>Z</sub> (mA)	Max	I <sub>Z</sub> (mA)	Max	I <sub>Z</sub> (mA)	Max	V <sub>R</sub> (V)
CZRFR52C2	Z0	1.90	2.10	5	100	5	600	1	100	1
CZRFR52C2V2	Z1	2.09	2.31	5	100	5	600	1	100	1
CZRFR52C2V4	Z2	2.28	2.52	5	85	5	600	1	100	1
CZRFR52C2V7	Z3	2.57	2.84	5	83	5	500	1	75	1
CZRFR52C3	Z4	2.85	3.15	5	95	5	500	1	50	1
CZRFR52C3V3	Z5	3.14	3.47	5	95	5	500	1	25	1
CZRFR52C3V6	Z6	3.42	3.78	5	95	5	500	1	15	1
CZRFR52C3V9	Z7	3.71	4.10	5	95	5	500	1	10	1
CZRFR52C4V3	Z8	4.09	4.52	5	95	5	500	1	5	1
CZRFR52C4V7	Z9	4.47	4.94	5	78	5	500	1	5	2
CZRFR52C5V1	ZA	4.85	5.36	5	60	5	480	1	0.1	0.8
CZRFR52C5V6	ZB	5.32	5.88	5	40	5	400	1	0.1	1
CZRFR52C6V2	ZC	5.89	6.51	5	10	5	200	1	0.1	2
CZRFR52C6V8	ZE	6.46	7.14	5	8	5	150	1	0.1	3
CZRFR52C7V5	ZF	7.13	7.88	5	7	5	50	1	0.1	5
CZRFR52C8V2	ZG	7.79	8.61	5	7	5	50	1	0.1	6
CZRFR52C9V1	ZH	8.65	9.56	5	10	5	50	1	0.1	7
CZRFR52C10	ZJ	9.50	10.50	5	15	5	70	1	0.1	7.5
CZRFR52C11	ZK	10.45	11.55	5	20	5	70	1	0.1	8.5
CZRFR52C12	ZM	11.40	12.60	5	20	5	90	1	0.1	9
CZRFR52C13	ZN	12.35	13.65	5	25	5	110	1	0.1	10
CZRFR52C15	ZP	14.25	15.75	5	30	5	110	1	0.1	11
CZRFR52C16	ZQ	15.20	16.80	5	40	5	170	1	0.1	12
CZRFR52C18	ZR	17.10	18.90	5	50	5	170	1	0.1	14
CZRFR52C20	ZS	19.00	21.00	5	50	5	220	1	0.1	15
CZRFR52C22	ZT	20.90	23.10	5	55	5	220	1	0.1	17
CZRFR52C24	ZU	22.80	25.20	5	80	5	220	1	0.1	18
CZRFR52C27	ZV	25.65	28.35	5	80	5	250	1	0.1	20
CZRFR52C30	ZW	28.50	31.50	5	80	5	250	1	0.1	23
CZRFR52C33	ZX	31.35	34.65	5	80	5	250	1	0.1	25
CZRFR52C36	ZY	34.20	37.80	5	90	5	250	1	0.1	27
CZRFR52C39	ZZ	37.05	40.95	5	90	5	300	1	0.1	29

## RATING AND CHARACTERISTIC CURVES (CZRFR52C2 Thru CZRFR52C39)

Fig.1 TEMPERATURE COEFFICIENTS

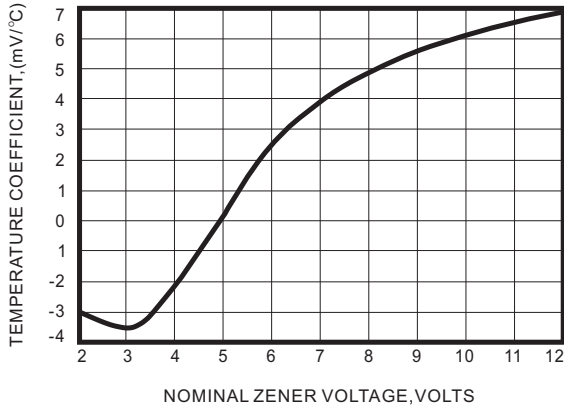


Fig.2 TEMPERATURE COEFFICIENTS

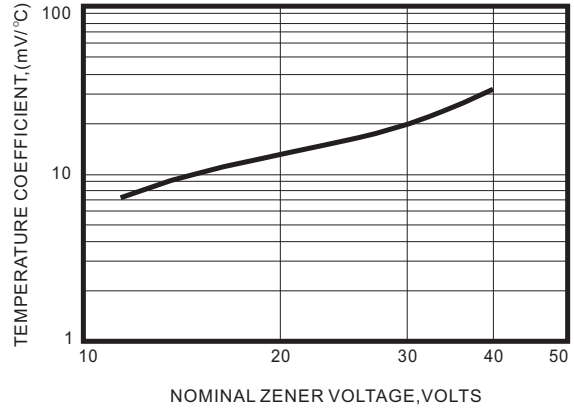


Fig.3 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

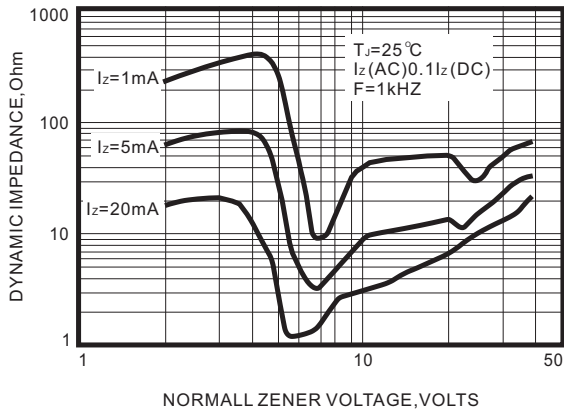


Fig.4 TYPICAL FORWARD VOLTAGE

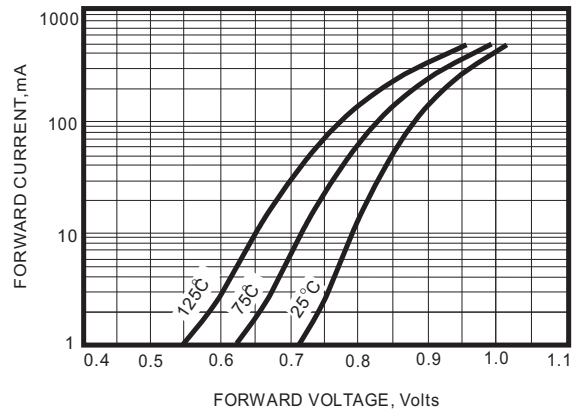


Fig.5 TYPICAL LEAKAGE CURRENT

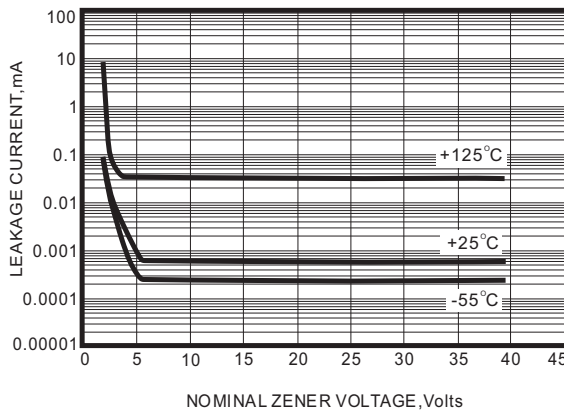
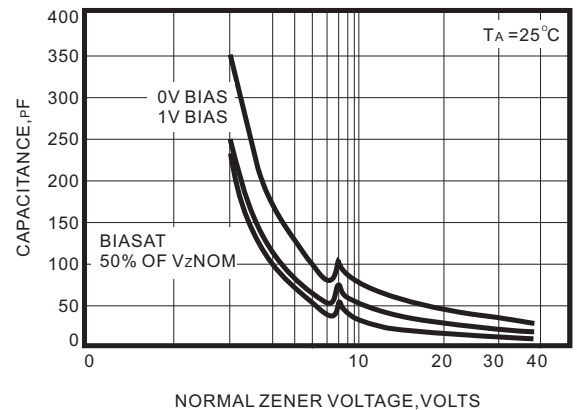


Fig.6 TYPICAL CAPACITANCE



## RATING AND CHARACTERISTIC CURVES (CZRFR52C2 Thru CZRFR52C39)

Fig.7 ZENER VOLTAGE VERSUS ZENER CURRENT

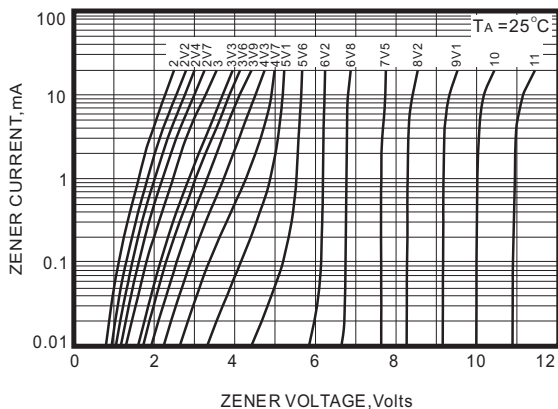


Fig.8 ZENER VOLTAGE VERSUS ZENER CURRENT

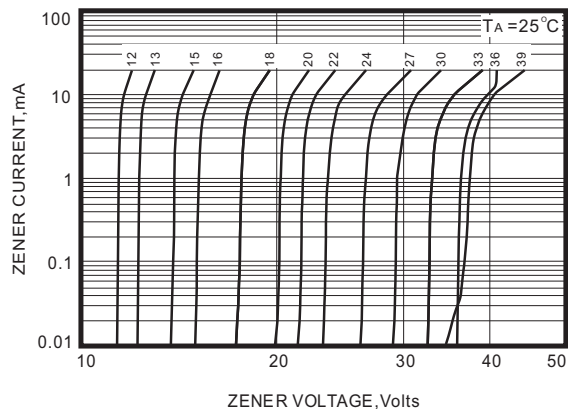
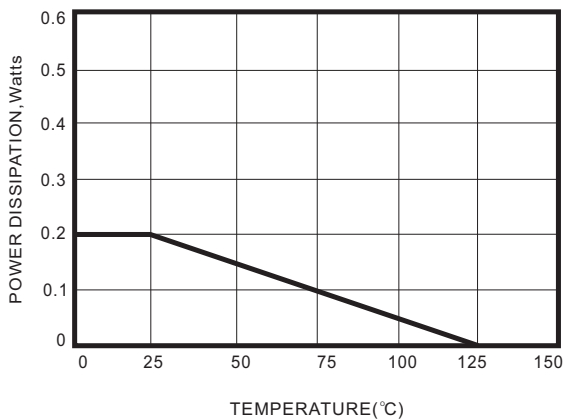
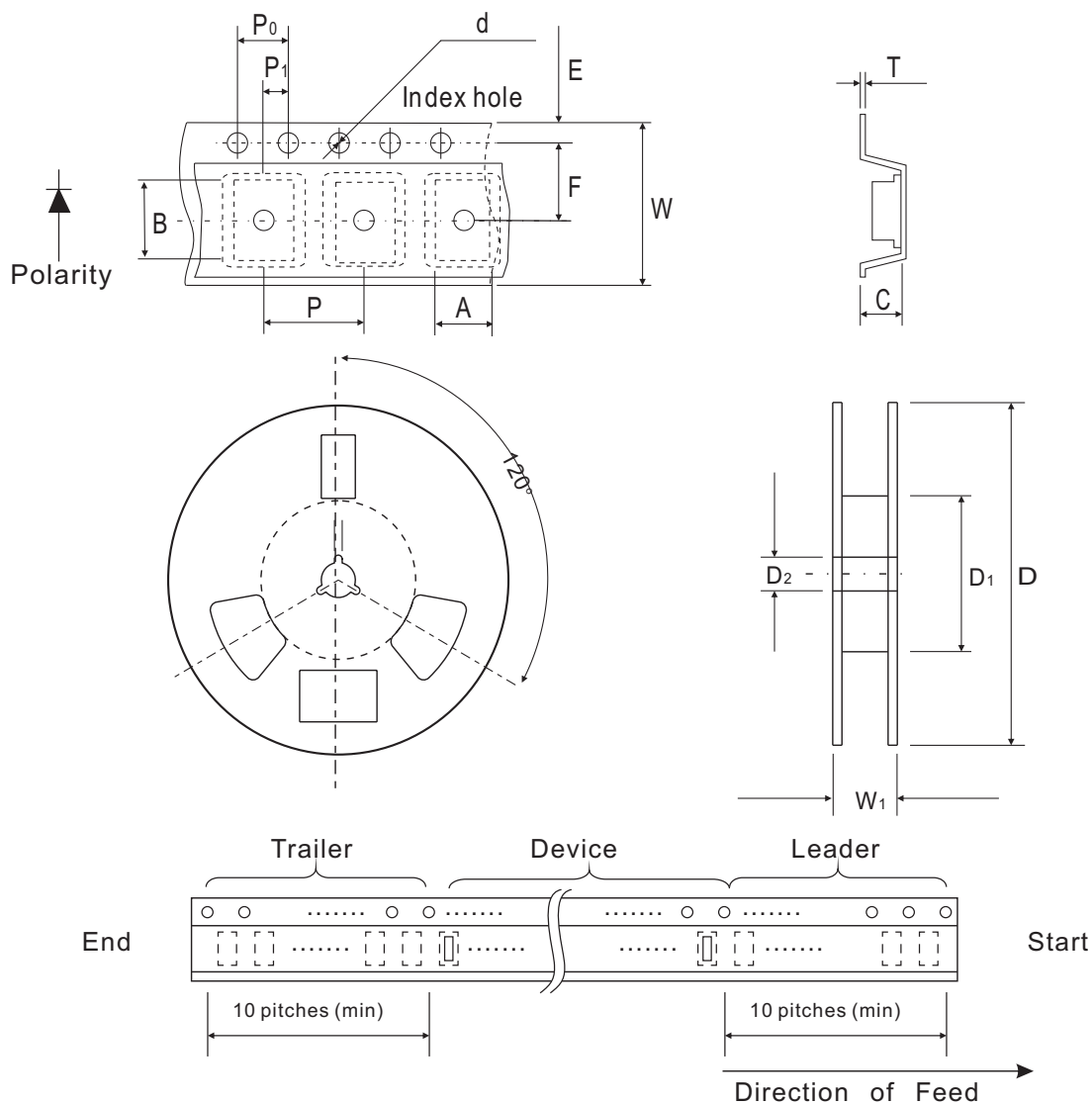


Fig.9 STEADY STATE POWER DERATING



## Reel Taping Specification

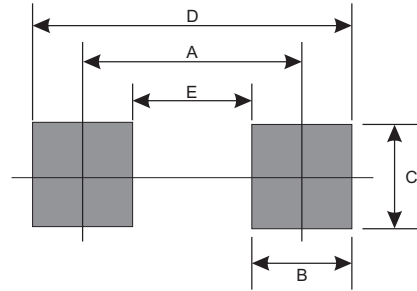


FR/1005	SYMBOL	A	B	C	d	D	D <sub>1</sub>	D <sub>2</sub>
	(mm)	1.55 ± 0.10	2.65 ± 0.10	1.05 ± 0.10	1.55 ± 0.05	178 ± 1	60.0 MIN.	13.0 ± 0.20
	(inch)	0.061 ± 0.004	0.104 ± 0.004	0.041 ± 0.004	0.061 ± 0.002	7.008 ± 0.04	2.362 MIN.	0.512 ± 0.008

FR/1005	SYMBOL	E	F	P	P <sub>0</sub>	P <sub>1</sub>	T	W	W <sub>1</sub>
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.23 ± 0.05	8.00 ± 0.20	13.5 MAX.
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.009 ± 0.002	0.315 ± 0.008	0.531 MAX.

## Suggested PAD Layout

SIZE	FR/1005	
	(mm)	(inch)
A	2.00	0.079
B	0.70	0.028
C	1.30	0.051
D	2.70	0.106
E	1.30	0.051



## Standard Package

Case Type	Qty per Reel	Reel Size
	(Pcs)	(inch)
FR/1005	4000	7