TOSHIBA Zenzer Diode Silicon Epitaxial Planar Type

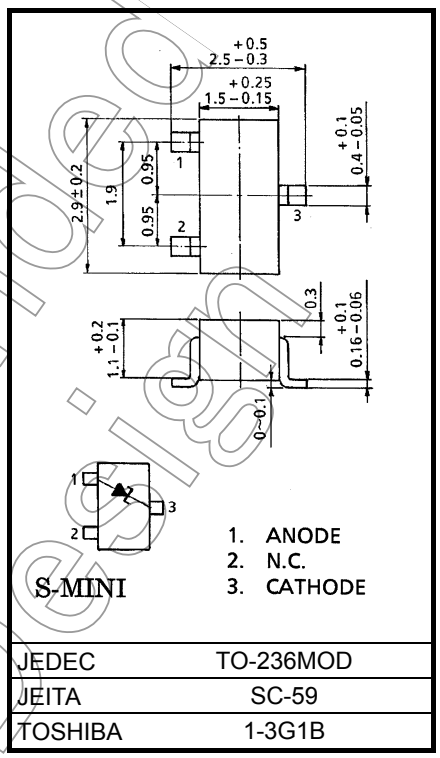
02CZ2.0~02CZ47

Constant Voltage Regulation Applications

Reference Voltage Applications

- Small package: SC-59
- Nominal voltage tolerance about ±2.5% (4.3V~24V)

Unit in mm



JEDEC	TO-236MOD
JEITA	SC-59
TOSHIBA	1-3G1B

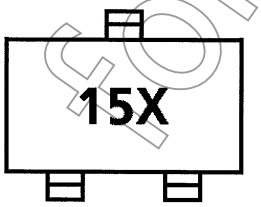
Weight: 0.012g

Absolute Maximum Ratings (Ta = 25°C)

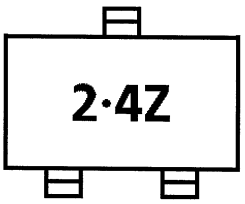
Characteristic	Symbol	Rating	Unit
Power dissipation	P	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Marking



(02CZ15-X)



(02CZ2.4-Z)

Electrical Characteristics (Ta = 25ºC)

Type No.	Zener Voltage * V_Z (V)		I_Z (mA)	Dynamic Impedance Z_Z(Ω)	I_Z (mA)	Knee Dynamic Impedance Z_{ZK} (Ω)	I_Z (mA)	Reverse Current I_R (μA)	V_R (V)
	Min	Max		Max		Max		Max	
02CZ2.0 (**)	1.85	2.15	5	100	5	1000	0.5	120	1.0
02CZ2.2 (**)	2.05	2.38	5	100	5	1000	0.5	120	1.0
02CZ2.4	2.28	2.60	5	100	5	1000	0.5	120	1.0
02CZ2.7	2.50	2.90	5	110	5	1000	0.5	120	1.0
02CZ3.0	2.80	3.20	5	120	5	1000	0.5	50	1.0
02CZ3.3	3.10	3.50	5	130	5	1000	0.5	20	1.0
02CZ3.6	3.40	3.80	5	130	5	1000	0.5	10	1.0
02CZ3.9	3.70	4.10	5	130	5	1000	0.5	10	1.0
02CZ4.3	4.00	4.50	5	130	5	1000	0.5	5	1.0
02CZ4.7	4.40	4.90	5	120	5	1000	0.5	5	1.0
02CZ5.1	4.80	5.40	5	70	5	1000	0.5	1	1.5
02CZ5.6	5.30	6.00	5	40	5	900	0.5	1	2.5
02CZ6.2	5.80	6.60	5	30	5	500	0.5	1	3.0
02CZ6.8	6.40	7.20	5	25	5	150	0.5	0.5	5.0
02CZ7.5	7.00	7.90	5	23	5	120	0.5	0.5	6.0
02CZ8.2	7.70	8.70	5	20	5	120	0.5	0.5	6.5
02CZ9.1	8.50	9.60	5	18	5	120	0.5	0.5	7.0
02CZ10	9.40	10.60	5	15	5	120	0.5	0.5	8.0
02CZ11	10.40	11.60	5	15	5	120	0.5	0.5	8.5
02CZ12	11.40	12.60	5	15	5	110	0.5	0.5	9.0
02CZ13	12.40	14.10	5	15	5	110	0.5	0.5	10
02CZ15	13.80	15.60	5	15	5	110	0.5	0.5	11
02CZ16	15.30	17.10	5	18	5	150	0.5	0.5	12
02CZ18	16.80	19.10	5	20	5	150	0.5	0.5	14
02CZ20	18.80	21.20	5	25	5	200	0.5	0.5	15
02CZ22	20.80	23.30	5	30	5	200	0.5	0.5	17
02CZ24	22.80	25.60	5	40	5	200	0.5	0.5	19
02CZ27	25.10	28.90	2	70	2	250	0.5	0.5	21
02CZ30	28.00	32.00	2	80	2	250	0.5	0.5	23
02CZ33	31.00	35.00	2	80	2	250	0.5	0.5	25
02CZ36	34.00	38.00	2	90	2	250	0.5	0.5	27
02CZ39	37.00	41.00	2	100	2	250	0.5	0.5	30
02CZ43	40.00	45.00	2	130	2	—	—	0.5	33
02CZ47	44.00	49.00	2	150	2	—	—	0.5	36

(*)Test time : t = 30ms (**) Product by order

Zener Voltage Classification

Type No.		Zener Voltage V_Z (V) t = 30ms I_Z = 5mA	
		Min	Max
02CZ2.0-X	X	1.85	2.05
02CZ2.0-Z	Z	1.95	2.15
02CZ2.2-X	X	2.05	2.26
02CZ2.2-Z	Z	2.16	2.38
02CZ2.4-X	X	2.28	2.50
02CZ2.4-Z	Z	2.40	2.60
02CZ2.7-X	X	2.50	2.75
02CZ2.7-Z	Z	2.65	2.90
02CZ3.0-X	X	2.80	3.05
02CZ3.0-Z	Z	2.95	3.20
02CZ3.3-X	X	3.10	3.35
02CZ3.3-Z	Z	3.25	3.50
02CZ3.6-X	X	3.40	3.65
02CZ3.6-Z	Z	3.55	3.80
02CZ3.9-X	X	3.70	3.97
02CZ3.9-Z	Z	3.87	4.10
02CZ4.3-X	X	4.00	4.23
02CZ4.3-Y	Y	4.13	4.35
02CZ4.3-Z	Z	4.25	4.50
02CZ4.7-X	X	4.40	4.63
02CZ4.7-Y	Y	4.53	4.76
02CZ4.7-Z	Z	4.66	4.90
02CZ5.1-X	X	4.80	5.07
02CZ5.1-Y	Y	4.97	5.24
02CZ5.1-Z	Z	5.14	5.40
02CZ5.6-X	X	5.30	5.63
02CZ5.6-Y	Y	5.43	5.81
02CZ5.6-Z	Z	5.61	6.00

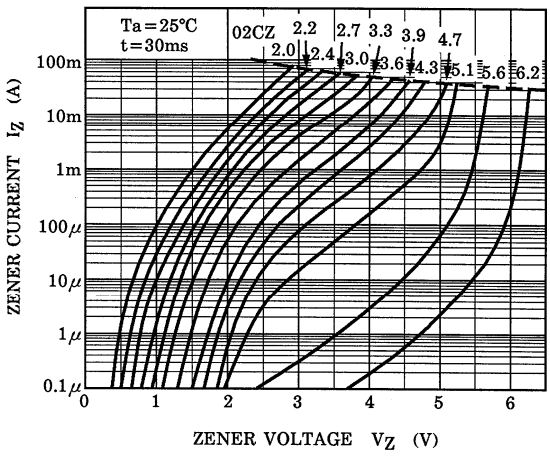
Zener Voltage Classification

Type No.		Zener Voltage V_Z (V) t=30ms I_Z = 5mA	
		Min	Max
02CZ6.2-X	X	5.80	6.20
02CZ6.2-Y	Y	6.00	6.39
02CZ6.2-Z	Z	6.19	6.60
02CZ6.8-X	X	6.40	6.80
02CZ6.8-Y	Y	6.60	7.02
02CZ6.8-Z	Z	6.82	7.20
02CZ7.5-X	X	7.00	7.43
02CZ7.5-Y	Y	7.23	7.66
02CZ7.5-Z	Z	7.46	7.90
02CZ8.2-X	X	7.70	8.16
02CZ8.2-Y	Y	7.96	8.43
02CZ8.2-Z	Z	8.23	8.70
02CZ9.1-X	X	8.50	9.00
02CZ9.1-Y	Y	8.80	9.30
02CZ9.1-Z	Z	9.10	9.60
02CZ10-X	X	9.40	9.93
02CZ10-Y	Y	9.73	10.26
02CZ10-Z	Z	10.06	10.60
02CZ11-X	X	10.40	10.98
02CZ11-Y	Y	10.73	11.26
02CZ11-Z	Z	11.06	11.60
02CZ12-X	X	11.40	11.93
02CZ12-Y	Y	11.73	12.26
02CZ12-Z	Z	12.06	12.60
02CZ13-X	X	12.40	13.08
02CZ13-Y	Y	12.88	13.57
02CZ13-Z	Z	13.37	14.10

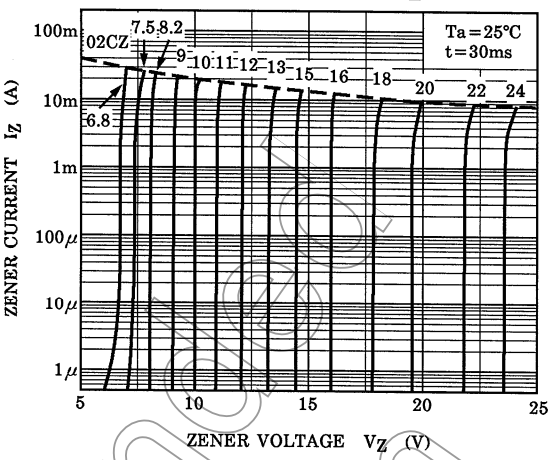
Zener Voltage Classification

Type No.		Zener Voltage V_Z (V) t = 30ms I_Z = 5mA	
		Min	Max
02CZ15-X	X	13.80	14.63
02CZ15-Y	Y	14.33	15.11
02CZ15-Z	Z	14.81	15.60
02CZ16-X	X	15.30	16.10
02CZ16-Y	Y	15.80	16.60
02CZ16-Z	Z	16.30	17.10
02CZ18-X	X	16.80	17.76
02CZ18-Y	Y	17.46	18.43
02CZ18-Z	Z	18.13	19.10
02CZ20-X	X	18.80	19.78
02CZ20-Y	Y	19.48	20.46
02CZ20-Z	Z	20.16	21.20
02CZ22-X	X	20.80	21.88
02CZ22-Y	Y	21.48	22.56
02CZ22-Z	Z	22.16	23.30
02CZ24-X	X	22.80	24.11
02CZ24-Y	Y	23.61	24.92
02CZ24-Z	Z	24.42	25.60

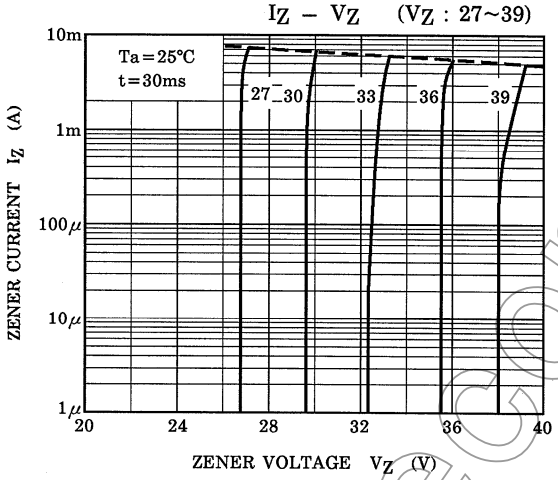
$I_Z - V_Z$ (V_Z : 2.0~6.2)



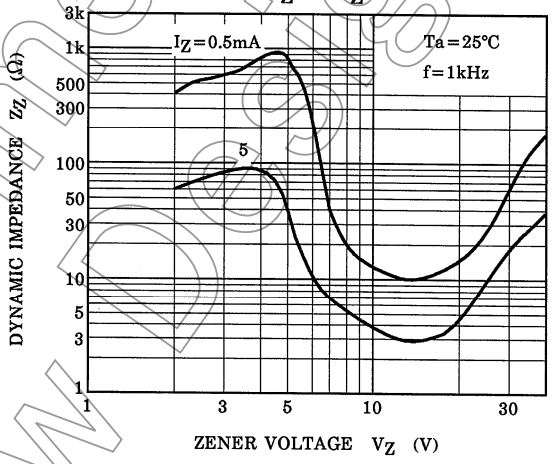
$I_Z - V_Z$ (V_Z : 6.8~24)



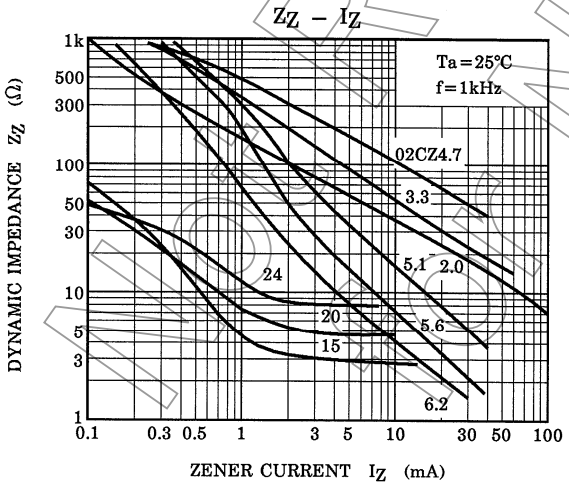
$I_Z - V_Z$ (V_Z : 27~39)



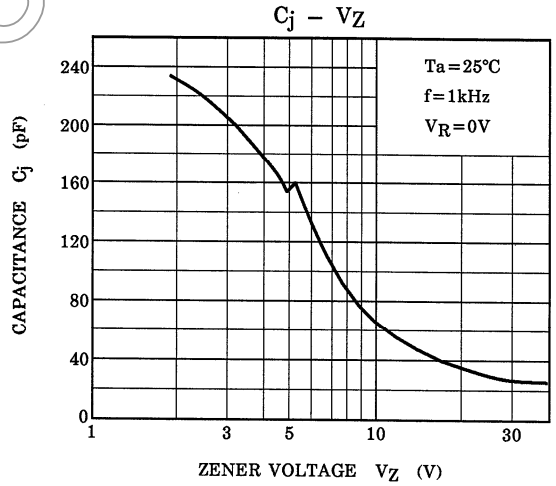
$Z_Z - V_Z$

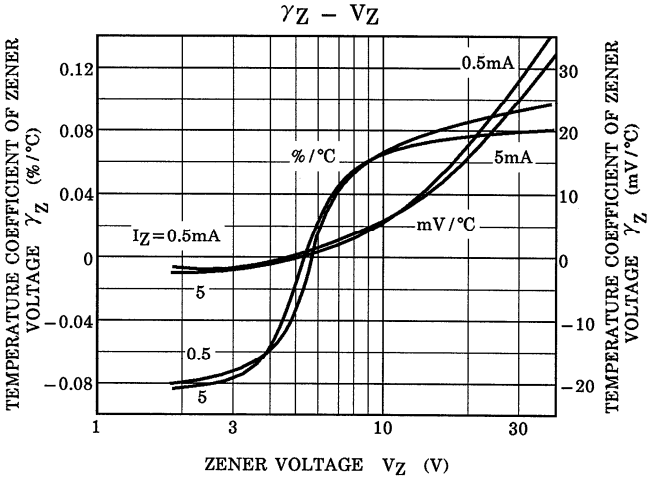


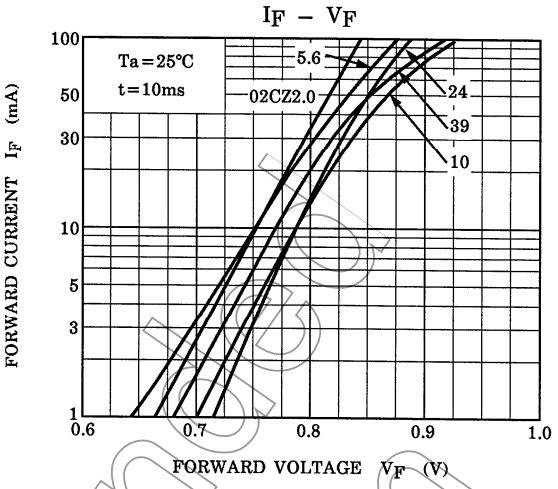
$Z_Z - I_Z$

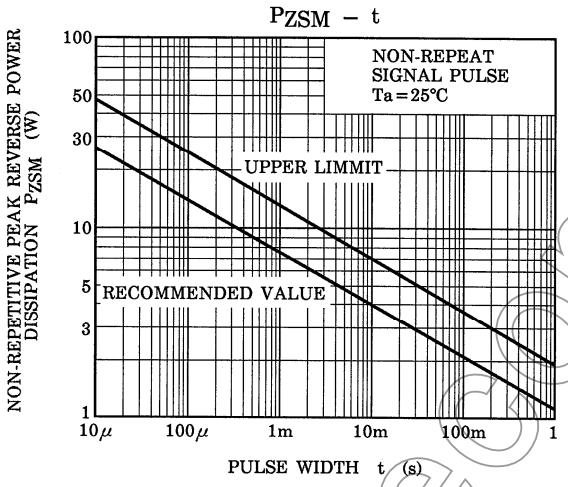


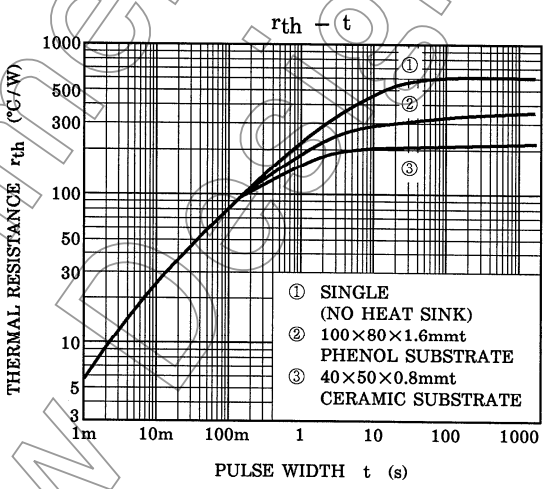
$C_j - V_Z$

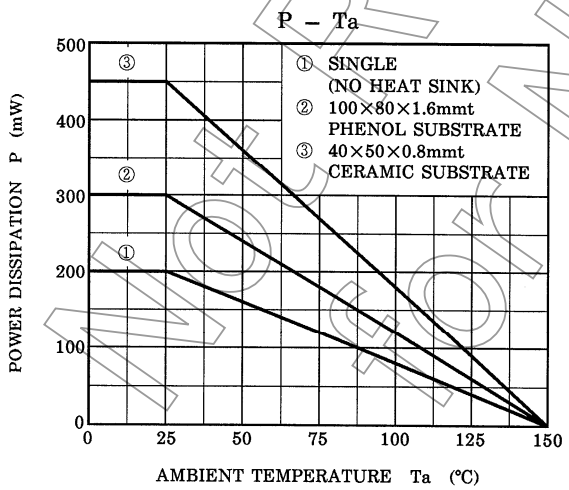












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