TOSHIBA ZENZER DIODE SILICON EPITAXIAL PLANAR TYPE

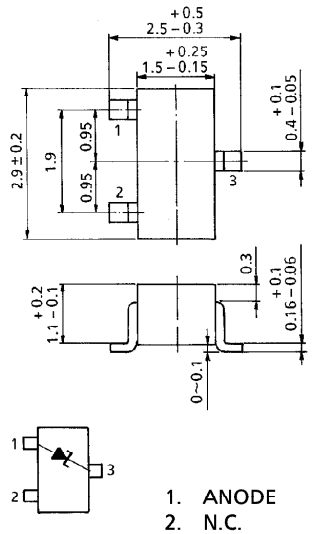
02CZ2.0~02CZ47

CONSTANT VOLTAGE REGULATION APPLICATIONS.

REFERENCE VOLTAGE APPLICATIONS.

- Small Package : SC-59
- Nominal Voltage Tolerance About ±2.5% (4.3V~24V)

Unit in mm



1. ANODE
2. N.C.
3. CATHODE

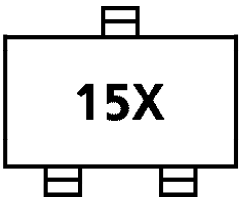
S-MINI	
JEDEC	TO-236MOD
EIAJ	SC-59
TOSHIBA	1-3G1B

Weight : 0.012g

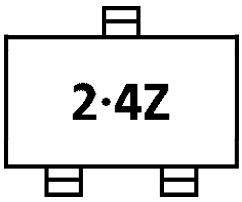
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Dissipation	P	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

MARKING



(02CZ15-X)



(02CZ2.4-Z)

961001EAA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

TYPE No.	ZENER VOLTAGE (*) V_Z (V)			DYNAMIC IMPEDANCE		KNEE DYNAMIC IMPEDANCE		REVERSE CURRENT	
	MIN.	MAX.	I_Z (mA)	Z_Z (Ω) MAX.	I_Z (mA)	Z_{ZK} (Ω) MAX.	I_Z (mA)	I_R (μA) MAX.	V_R (V)
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					
		REFERENCE					
		I_Z=0.5mA		I_Z=1mA		I_Z=5mA	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
02CZ2.0-X	X	1.28	1.46	1.40	1.62	1.85	2.05
02CZ2.0-Z	Z	1.38	1.52	1.52	1.69	1.95	2.15
02CZ2.2-X	X	1.45	1.60	1.59	1.78	2.05	2.26
02CZ2.2-Z	Z	1.52	1.67	1.68	1.92	2.16	2.38
02CZ2.4-X	X	1.64	1.81	1.82	2.03	2.28	2.50
02CZ2.4-Z	Z	1.72	1.89	1.87	2.10	2.40	2.60
02CZ2.7-X	X	1.81	2.00	2.00	2.21	2.50	2.75
02CZ2.7-Z	Z	1.92	2.12	2.11	2.33	2.65	2.90
02CZ3.0-X	X	2.04	2.23	2.23	2.46	2.80	3.05
02CZ3.0-Z	Z	2.16	2.35	2.36	2.58	2.95	3.20
02CZ3.3-X	X	2.27	2.47	2.48	2.73	3.10	3.35
02CZ3.3-Z	Z	2.39	2.60	2.63	2.86	3.25	3.50
02CZ3.6-X	X	2.51	2.74	2.76	3.00	3.40	3.65
02CZ3.6-Z	Z	2.65	2.89	2.90	3.16	3.55	3.80
02CZ3.9-X	X	2.79	3.06	3.06	3.33	3.70	3.97
02CZ3.9-Z	Z	2.95	3.20	3.23	3.46	3.87	4.10
02CZ4.3-X	X	3.06	3.35	3.36	3.63	4.00	4.23
02CZ4.3-Y	Y	3.23	3.46	3.53	3.75	4.13	4.35
02CZ4.3-Z	Z	3.35	3.72	3.65	3.93	4.25	4.50
02CZ4.7-X	X	3.56	3.92	3.83	4.10	4.40	4.63
02CZ4.7-Y	Y	3.74	4.05	4.00	4.25	4.53	4.76
02CZ4.7-Z	Z	3.90	4.22	4.15	4.44	4.66	4.90
02CZ5.1-X	X	4.08	4.48	4.34	4.66	4.80	5.07
02CZ5.1-Y	Y	4.32	4.73	4.56	4.90	4.97	5.24
02CZ5.1-Z	Z	4.56	4.96	4.80	5.12	5.14	5.40
02CZ5.6-X	X	4.80	5.36	5.02	5.43	5.30	5.63
02CZ5.6-Y	Y	5.00	5.63	5.23	5.65	5.43	5.81
02CZ5.6-Z	Z	5.30	5.90	5.45	5.90	5.61	6.00

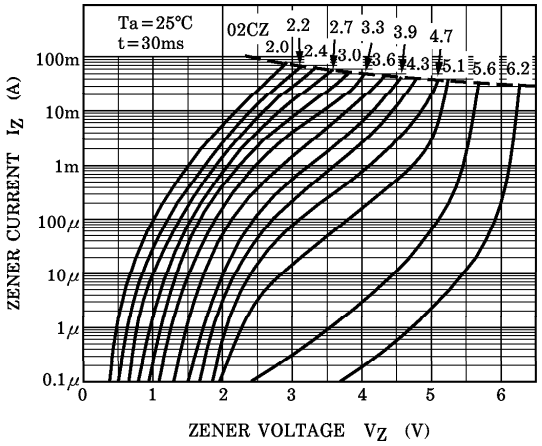
ZENER VOLTAGE CLASSIFICATION

TYPE No.		ZENER VOLTAGE V_Z (V) t=30ms					
		REFERENCE					
		I_Z=0.5mA		I_Z=1mA		I_Z=5mA	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
02CZ6.2-X	X	5.60	6.12	5.70	6.13	5.80	6.20
02CZ6.2-Y	Y	5.89	6.34	5.93	6.35	6.00	6.39
02CZ6.2-Z	Z	6.12	6.57	6.15	6.58	6.19	6.60
02CZ6.8-X	X	6.35	6.80	6.38	6.80	6.40	6.80
02CZ6.8-Y	Y	6.59	7.02	6.60	7.02	6.60	7.02
02CZ6.8-Z	Z	6.81	7.20	6.82	7.20	6.82	7.20
02CZ7.5-X	X	6.96	7.43	6.97	7.43	7.00	7.43
02CZ7.5-Y	Y	7.19	7.66	7.20	7.66	7.23	7.66
02CZ7.5-Z	Z	7.42	7.90	7.43	7.90	7.46	7.90
02CZ8.2-X	X	7.66	8.16	7.67	8.16	7.70	8.16
02CZ8.2-Y	Y	7.92	8.43	7.93	8.43	7.96	8.43
02CZ8.2-Z	Z	8.19	8.70	8.20	8.70	8.23	8.70
02CZ9.1-X	X	8.46	9.00	8.47	9.00	8.50	9.00
02CZ9.1-Y	Y	8.76	9.30	8.77	9.30	8.80	9.30
02CZ9.1-Z	Z	9.06	9.60	9.07	9.60	9.10	9.60
02CZ10-X	X	9.36	9.93	9.37	9.93	9.40	9.93
02CZ10-Y	Y	9.69	10.26	9.70	10.26	9.73	10.26
02CZ10-Z	Z	10.02	10.60	10.03	10.60	10.06	10.60
02CZ11-X	X	10.34	10.95	10.36	10.96	10.40	10.98
02CZ11-Y	Y	10.67	11.23	10.69	11.24	10.73	11.26
02CZ11-Z	Z	11.00	11.57	11.02	11.58	11.06	11.60
02CZ12-X	X	11.34	11.90	11.36	11.91	11.40	11.93
02CZ12-Y	Y	11.67	12.23	11.69	12.24	11.73	12.26
02CZ12-Z	Z	12.00	12.57	12.02	12.58	12.06	12.60
02CZ13-X	X	12.34	13.05	12.36	13.06	12.40	13.08
02CZ13-Y	Y	12.82	13.54	12.84	13.55	12.88	13.57
02CZ13-Z	Z	13.31	14.07	13.33	14.08	13.37	14.10

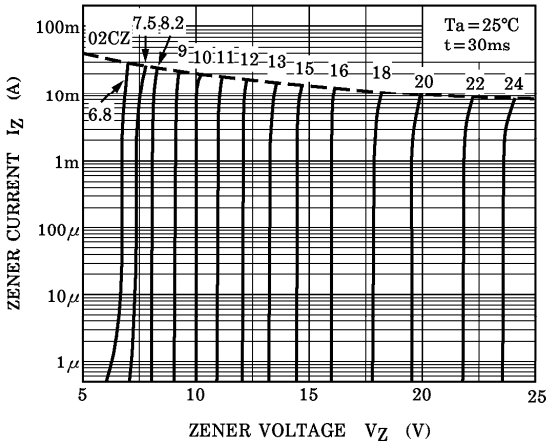
ZENER VOLTAGE CLASSIFICATION

TYPE No.		ZENER VOLTAGE V_Z (V) t=30ms					
		REFERENCE					
		I_Z=0.5mA		I_Z=1mA		I_Z=5mA	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
02CZ15-X	X	13.74	14.60	13.76	14.61	13.80	14.63
02CZ15-Y	Y	14.27	15.08	14.29	15.09	14.33	15.11
02CZ15-Z	Z	14.75	15.54	14.77	15.56	14.81	15.60
02CZ16-X	X	15.15	16.04	15.18	16.06	15.30	16.10
02CZ16-Y	Y	15.65	16.54	15.68	16.56	15.80	16.60
02CZ16-Z	Z	16.15	17.04	16.18	17.06	16.30	17.10
02CZ18-X	X	16.65	17.70	16.68	17.72	16.80	17.76
02CZ18-Y	Y	17.31	18.37	17.34	18.39	17.46	18.43
02CZ18-Z	Z	17.98	19.04	18.01	19.06	18.13	19.10
02CZ20-X	X	18.65	19.72	18.68	19.74	18.80	19.78
02CZ20-Y	Y	19.33	20.40	19.36	20.42	19.48	20.46
02CZ20-Z	Z	19.97	21.14	20.01	21.16	20.16	21.20
02CZ22-X	X	20.61	21.82	20.65	21.84	20.80	21.88
02CZ22-Y	Y	21.29	22.50	21.33	22.52	21.48	22.56
02CZ22-Z	Z	21.97	23.24	22.01	23.26	22.16	23.30
02CZ24-X	X	22.61	24.05	22.65	24.07	22.80	24.11
02CZ24-Y	Y	23.42	24.86	23.46	24.88	23.61	24.92
02CZ24-Z	Z	24.23	25.54	24.27	25.56	24.42	25.60

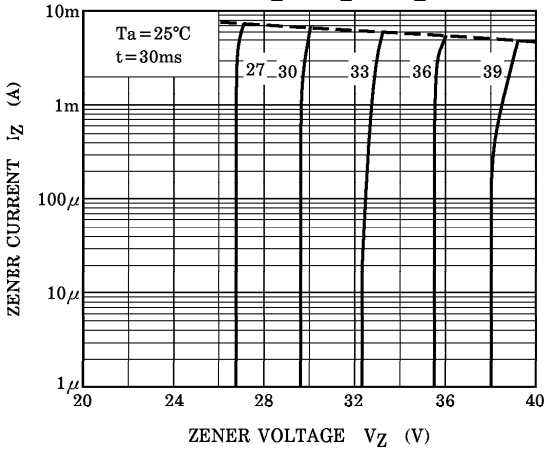
$I_Z - V_Z$ (V_Z : 2.0~6.2)



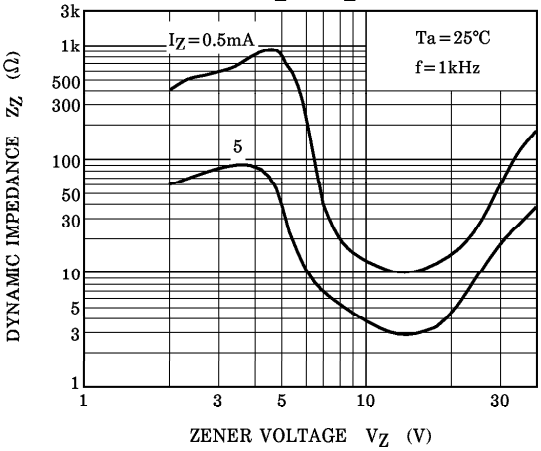
$I_Z - V_Z$ (V_Z : 6.8~24)



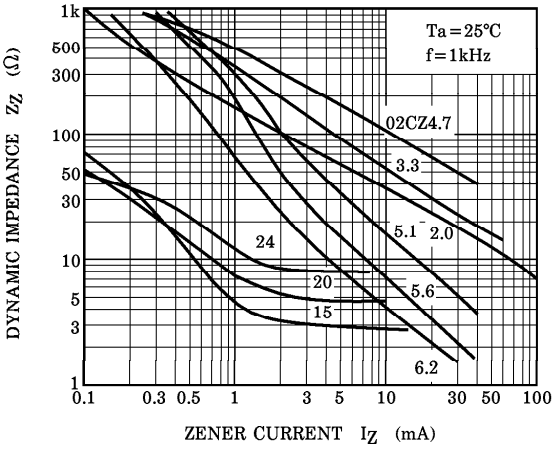
$I_Z - V_Z$ (V_Z : 27~39)



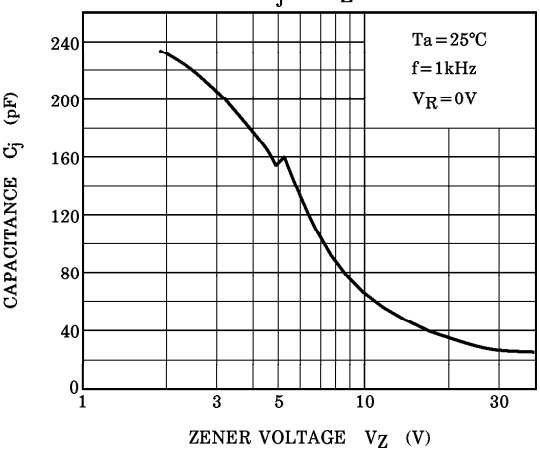
$Z_Z - V_Z$

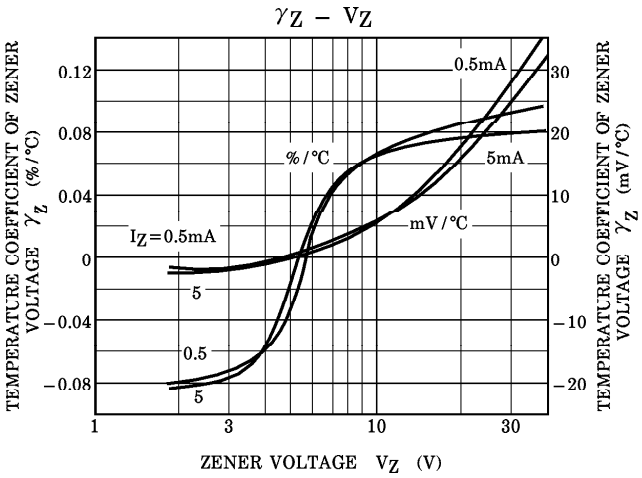


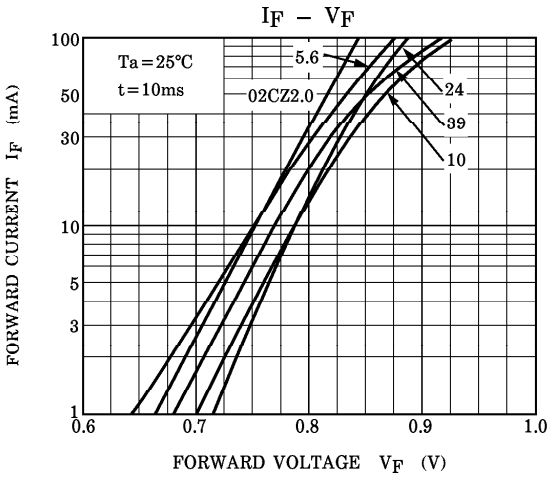
$Z_Z - I_Z$

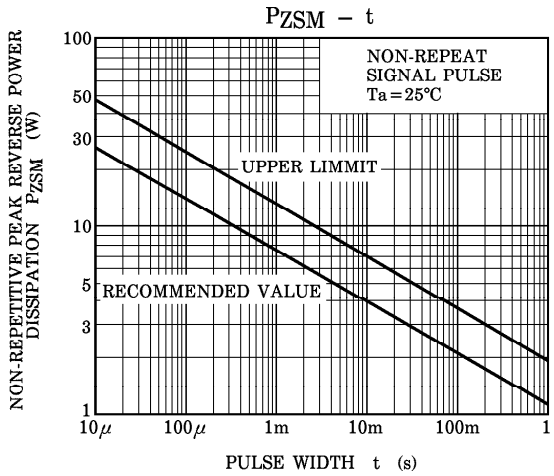


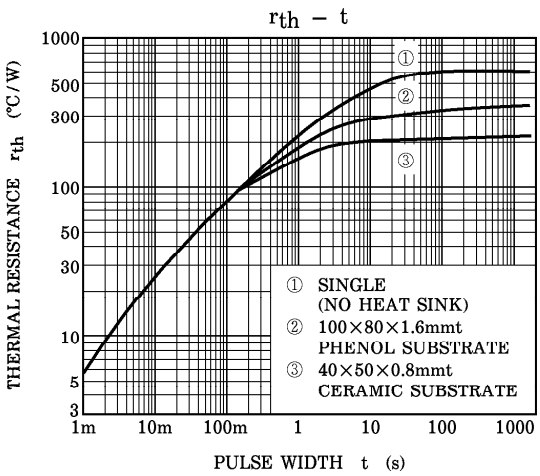
$C_j - V_Z$

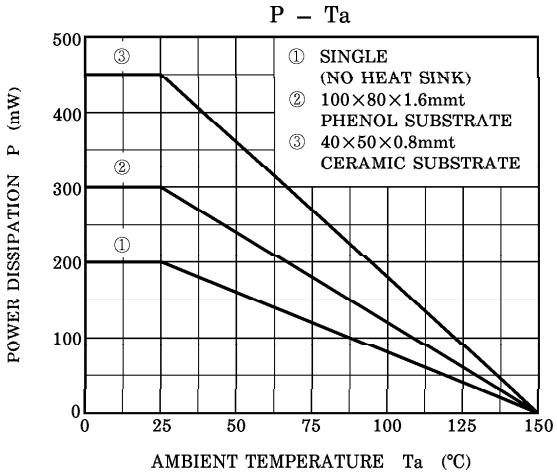



γZ – VZ
TEMPERATURE COEFFICIENT OF ZENER VOLTAGE γZ (%/°C)
TEMPERATURE COEFFICIENT OF ZENER VOLTAGE γZ (mV/°C)
0.12
0.08
0.04
0
−0.04
−0.08
30
20
10
0
−10
−20
0.5mA
5mA
%/°C
mV/°C
IZ=0.5mA
5
0.5
5
1
3
10
30
ZENER VOLTAGE VZ (V)


IF – VF
FORWARD CURRENT IF (mA)
100
50
30
10
5
3
1
Ta=25°C
t=10ms
5.6
02CZ2.0
24
39
10
0.6
0.7
0.8
0.9
1.0
FORWARD VOLTAGE VF (V)


PZSM – t
NON-REPETITIVE PEAK REVERSE POWER DISSIPATION PZSM (W)
100
50
30
10
5
3
1
NON-REPEAT
SIGNAL PULSE
Ta=25°C
UPPER LIMMIT
RECOMMENDED VALUE
10μ
100μ
1m
10m
100m
1
PULSE WIDTH t (s)


rth – t
THERMAL RESISTANCE rth (°C/W)
1000
500
300
100
50
30
10
5
3
①
②
③
① SINGLE
(NO HEAT SINK)
② 100×80×1.6mmt
PHENOL SUBSTRATE
③ 40×50×0.8mmt
CERAMIC SUBSTRATE
1m
10m
100m
1
10
100
1000
PULSE WIDTH t (s)


P – Ta
POWER DISSIPATION P (mW)
500
400
300
200
100
0
③
②
①
① SINGLE
(NO HEAT SINK)
② 100×80×1.6mmt
PHENOL SUBSTRATE
③ 40×50×0.8mmt
CERAMIC SUBSTRATE
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.