HIGH VOLTAGE FAST SWITCHING NPN POWER TRANSISTOR APT13003E

General Description

The APT13003E series are high voltage, high speed switching NPN Power transistors specially designed for off-line switch mode power supplies with low output power.

The APT13003E series are available in TO-92 and TO-126 packages.

Features

- High Switching Speed
- High Collector-Emitter Voltage
- Low Cost
- Bulk and Ammo Packing TO-92 Package and TO-126 Package

Applications

- Battery Chargers for Mobile Phone of BCD Solution
- Power Supply for DVD/STB of BCD Solution

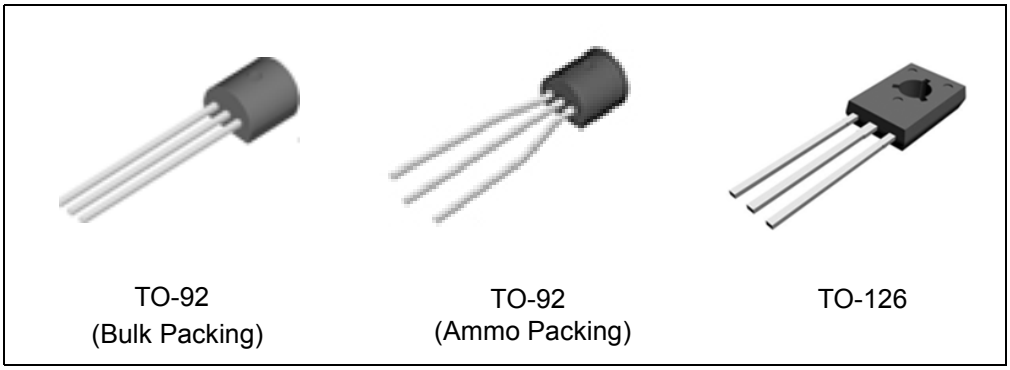


Figure 1. Package Types of APT13003E

Pin Configuration

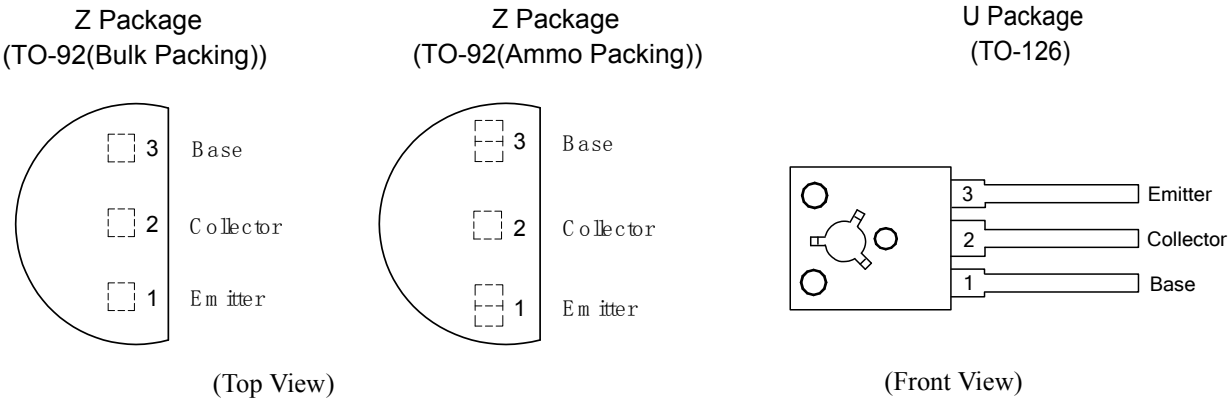
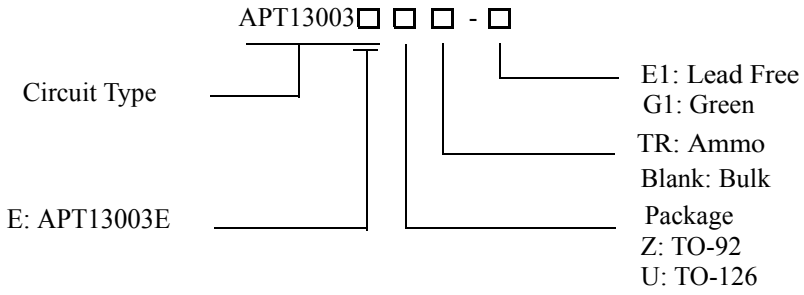


Figure 2. Pin Configurations of APT13003E

HIGH VOLTAGE FAST SWITCHING NPN POWER TRANSISTOR **APT13003E**

Ordering Information



Package	Part Number		Marking ID		Packing Type
	Lead Free	Green	Lead Free	Green	
TO-92	APT13003EZ-E1	APT13003EZ-G1	13003EZ-E1	13003EZ-G1	Bulk
	APT13003EZTR-E1	APT13003EZTR-G1	13003EZ-E1	13003EZ-G1	Ammo
TO-126	APT13003EU-E1	APT13003EU-G1	EU13003E	GU13003E	Bulk

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

Absolute Maximum Ratings (Note 1)

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage (V_{BE}=0)		V_{CES}	700	V
Collector-Emitter Voltage (I_B=0)		V_{CEO}	465	V
Emitter-Base Voltage (I_C=0)		V_{EBO}	9	V
Collector Current		I_C	1.5	A
Collector Peak Current (Pulse) (Note 2)		I_{CM}	3	A
Base Current		I_B	0.75	A
Base Peak Current (Pulse) (Note 2)		I_{BM}	1.5	A
Power Dissipation, T_A=25°C	For TO-92	P_{TOT}	1.1	W
Power Dissipation, T_C=25°C	For TO-126	P_{TOT}	20	W
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-65 to 150	°C

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Note 2: Pulse test for Pulse Width < 5ms, Duty Cycle ≤ 10%.

Thermal Characteristics

Parameter		Symbol	Value	Unit
Thermal Resistance (Junction-to-Case)	For TO-92	θ_{JC}	83.3	°C/W
	For TO-126		6.25	
Thermal Resistance (Junction-to-Ambient)	For TO-92	θ_{JA}	113.6	°C/W
	For TO-126		96	

Electrical Characteristics

(T_C=25°C, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector Cut-off Current (V_{BE}=-1.5V)	I_{CEV}	V_{CE}=700V			10	μA
Collector-Emitter Sustaining Voltage (I_B=0)	V_{CEO} (sus)	I_C=100μA	465			V
Collector-Emitter Saturation Voltage (Note 3)	V_{CE} (sat)	I_C=0.5A, I_B=0.1A		0.17	0.3	V
		I_C=1.0A, I_B=0.25A		0.29	0.4	
Base-Emitter Saturation Voltage (Note 3)	V_{BE} (sat)	I_C=0.5A, I_B=0.1A			1.0	V
		I_C=1.0A, I_B=0.25A			1.2	
DC Current Gain (Note 3)	h_{FE}	I_C=0.3A, V_{CE}=2V	15			
		I_C=0.5A, V_{CE}=2V	13	17	30	
		I_C=1.0A, V_{CE}=2V	5		25	
Output Capacitance	C_{ob}	V_{CB}=10V, f=0.1MH$_Z$		16		pF
Current Gain Bandwidth Product	f_T	V_{CE}=10V, I_C=0.1A	4			MHz
Turn-on Time with Resistive Load	ton	I_C=1A, V_{CC}=125V, I_{B1}=0.2A, I_{B2}=-0.2A, T_P=25μS		0.3	1	μs
Storage Time with Resistive Load	ts			1.8	3	
Fall Time with Resistive Load	tf			0.28	0.4	

Note 3: Pulse test for Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Typical Performance Characteristics

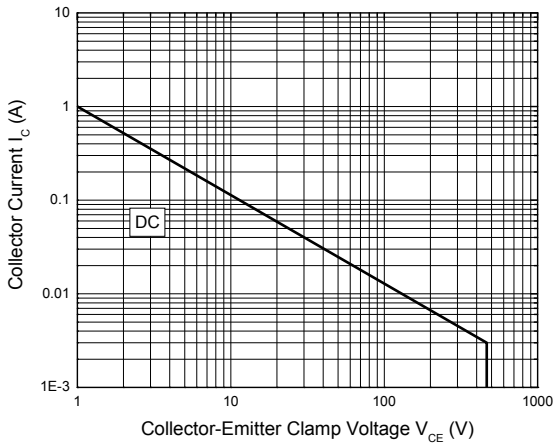


Figure 3. Safe Operating Areas (TO-92 Package)

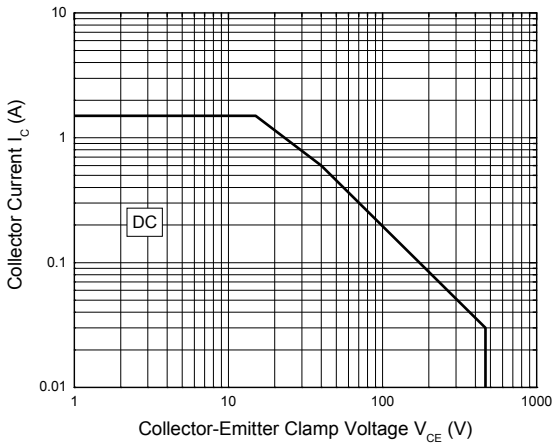


Figure 4. Safe Operating Areas (TO-126 Package)

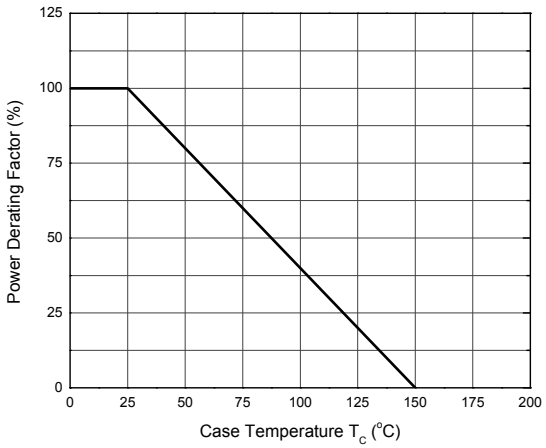


Figure 5. Power Derating Curve

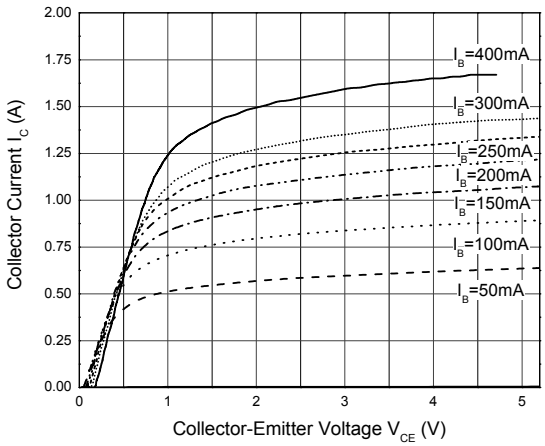


Figure 6. Static Characteristics

Typical Performance Characteristics (Continued)

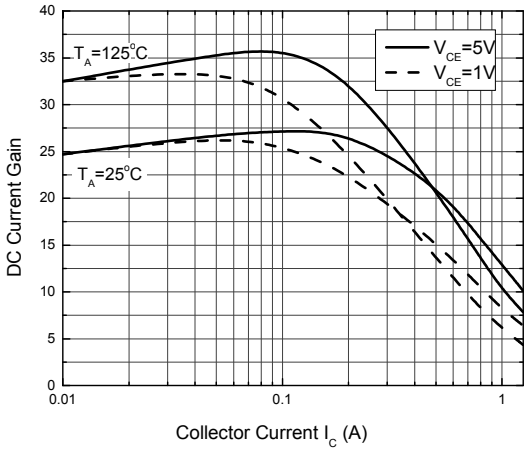


Figure 7. DC Current Gain

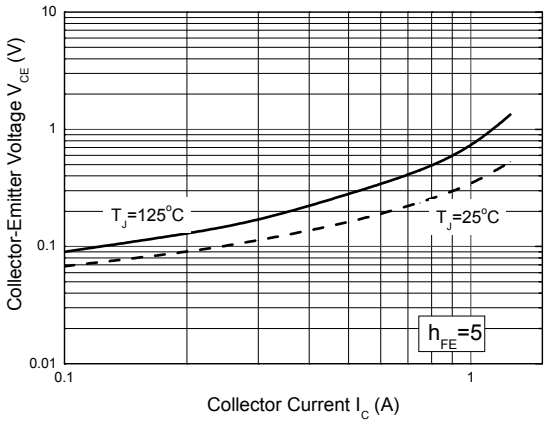


Figure 8. Collector-Emitter Saturation Voltage

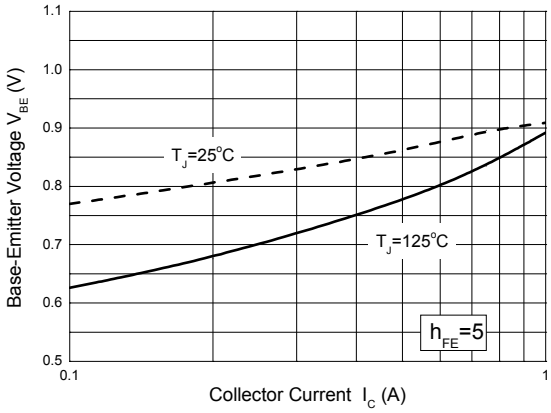


Figure 9. Base-Emitter Saturation Voltage

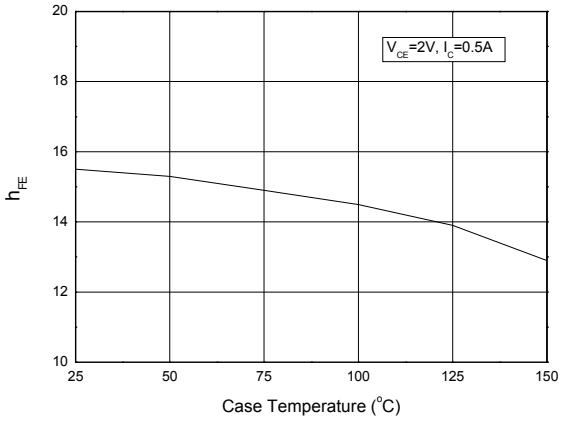
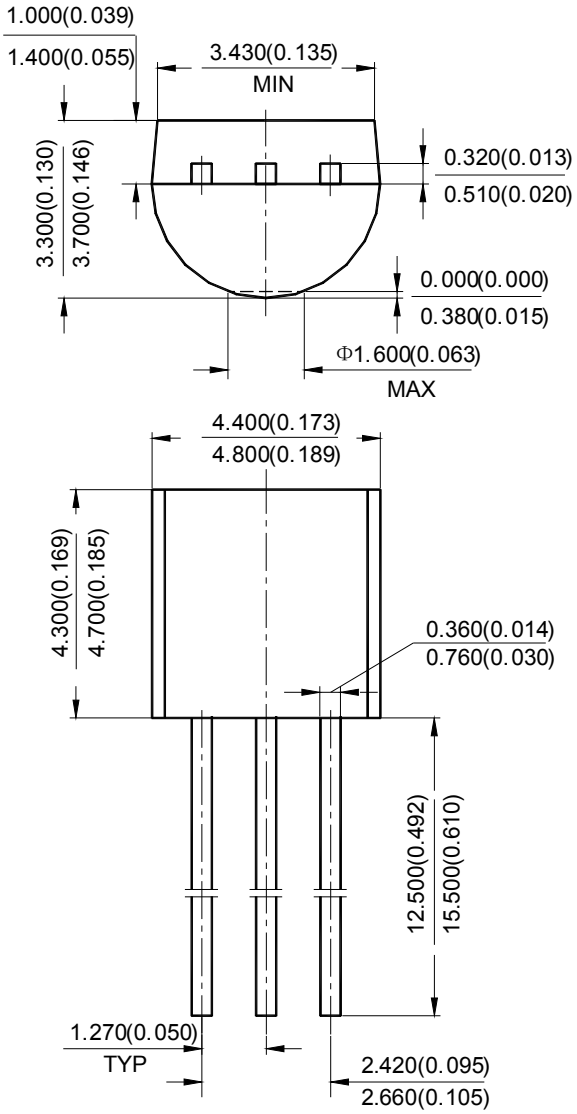


Figure 10. h_{FE} vs. Case Temperature

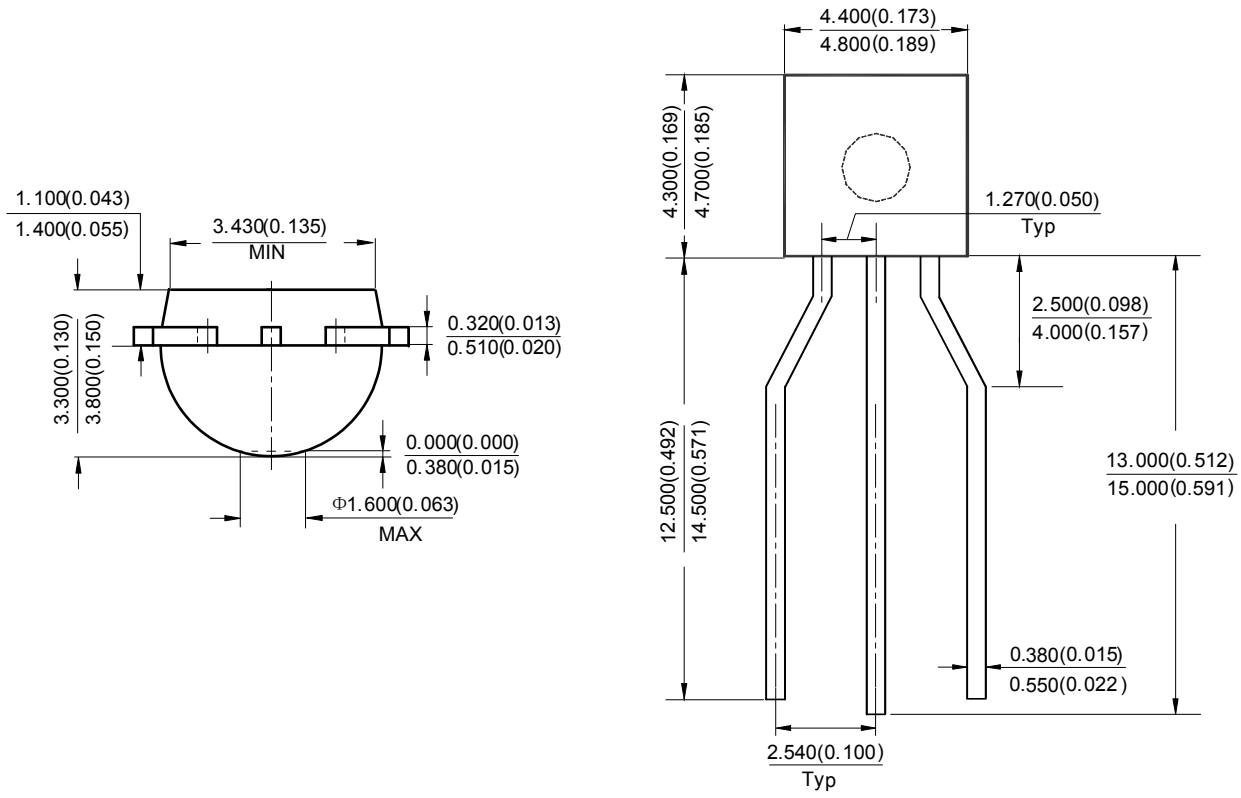
Mechanical Dimensions

TO-92 (Bulk Packing) **Unit: mm(inch)**



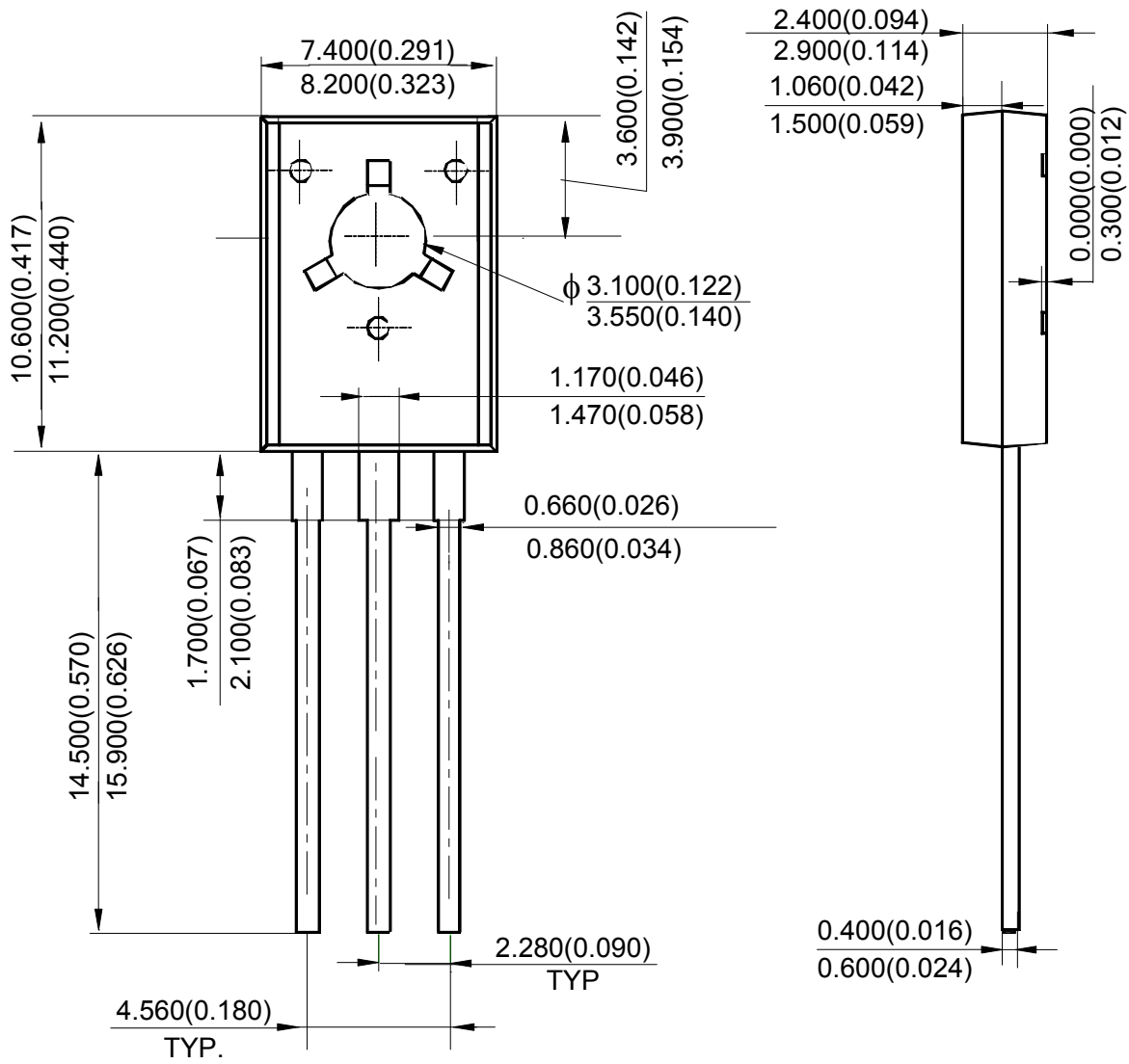
Mechanical Dimensions (Continued)

TO-92 (Ammo Packing) **Unit: mm(inch)**



Mechanical Dimensions (Continued)

TO-126 **Unit: mm(inch)**



BCD Semiconductor Manufacturing Limited

http://www.bcdsemi.com

IMPORTANT NOTICE

BCD Semiconductor Manufacturing Limited reserves the right to make changes without further notice to any products or specifications herein. BCD Semiconductor Manufacturing Limited does not assume any responsibility for use of any its products for any particular purpose, nor does BCD Semiconductor Manufacturing Limited assume any liability arising out of the application or use of any its products or circuits. BCD Semiconductor Manufacturing Limited does not convey any license under its patent rights or other rights nor the rights of others.

MAIN SITE

- Headquarters
BCD Semiconductor Manufacturing Limited
No. 1600, Zi Xing Road, Shanghai ZiZhu Science-based Industrial Park, 200241, China
Tel: +86-21-24162266, Fax: +86-21-24162277

- Wafer Fab
Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd.
800 Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

REGIONAL SALES OFFICE

Shenzhen Office
Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd., Shenzhen Office
Unit A Room 1203, Skyworth Bldg., Gaoxin Ave.1.S., Nanshan District, Shenzhen, China
Tel: +86-755-8826 7951
Fax: +86-755-8826 7865

Taiwan Office
BCD Semiconductor (Taiwan) Company Limited
4F, 298-1, Rui Guang Road, Nei-Hu District, Taipei, Taiwan
Tel: +886-2-2656 2808
Fax: +886-2-2656 2806

USA Office
BCD Semiconductor Corp.
30920 Huntwood Ave. Hayward, CA 94544, USA
Tel : +1-510-324-2988
Fax: +1-510-324-2788

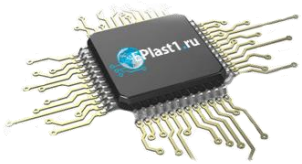
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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.