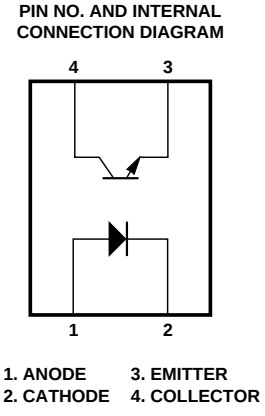
Agilent HCPL-817 Phototransistor Optocoupler High Density Mounting Type

Data Sheet

Description

The HCPL-817 contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin DIP package and available in wide-lead spacing option and lead bend SMD option. Input-output isolation voltage is 5000 Vrms. Response time, t_r, is typically 4 µs and minimum CTR is 50% at input current of 5 mA.

Functional Diagram



Ordering Information

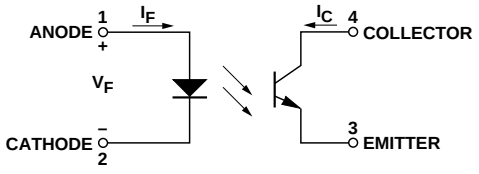
Specify part number followed by Option Number (if desired).

HCPL-817-XXXE

Lead Free Option Number

000 = No Options
060 = IEC/EN/DIN EN 60747-5-2 Option
W00 = 0.4" Lead Spacing Option
300 = Lead Bend SMD Option
500 = Tape and Reel Packaging Option
00A = Rank Mark A
00B = Rank Mark B
00C = Rank Mark C
00D = Rank Mark D
00L = Rank Mark L

Schematic



Features

- **Current Transfer Ratio (CTR: min. 50% at I_F = 5 mA, V_{CE} = 5 V)**
- **High input-output isolation voltage (V_{iso} = 5000 Vrms)**
- **Response time (t_r: typ., 4 µs at V_{CE} = 2 V, I_C = 2 mA, R_L = 100 Ω)**
- **Compact dual-in-line package**
- **UL approved**
- **CSA approved**
- **IEC/EN/DIN EN 60747-5-2 approved**
- **Options available:**
  - **Leads with 0.4" (10.16 mm) spacing (W00)**
  - **Leads bends for surface mounting (300)**
  - **Tape and reel for SMD (500)**
  - **IEC/EN/DIN EN 60747-5-2 approvals (060)**

Applications

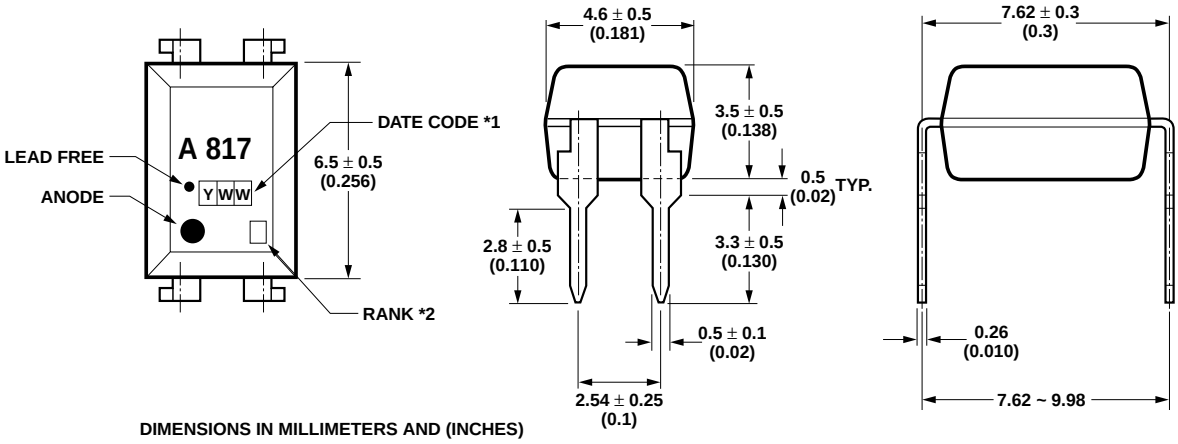
- **Signal transmission between circuits of different potentials and impedances**
- **I/O interfaces for computers**
- **Feedback circuit in power supply**

CAUTION: *It is advised that normal static precautions be taken in handling and assembly of this component to prevent damage and/or degradation which may be induced by ESD.*

Agilent Technologies

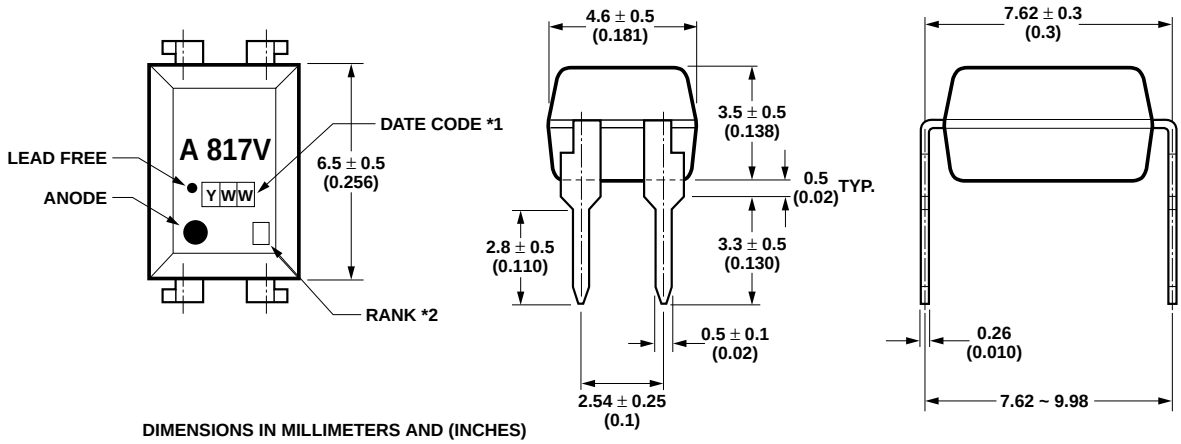
Package Outline Drawings

HCPL-817-000E



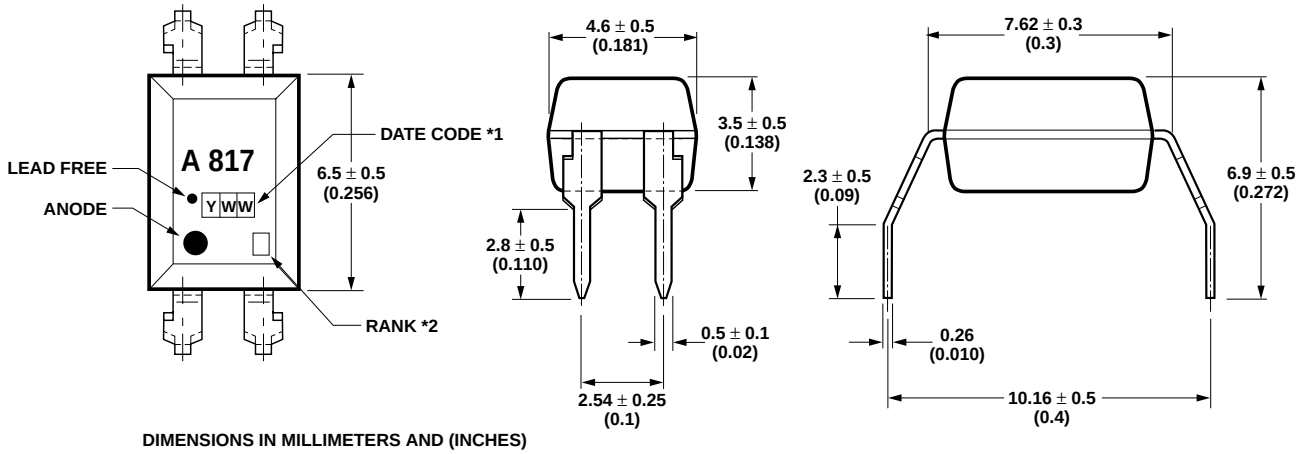
DIMENSIONS IN MILLIMETERS AND (INCHES)

HCPL-817-060E



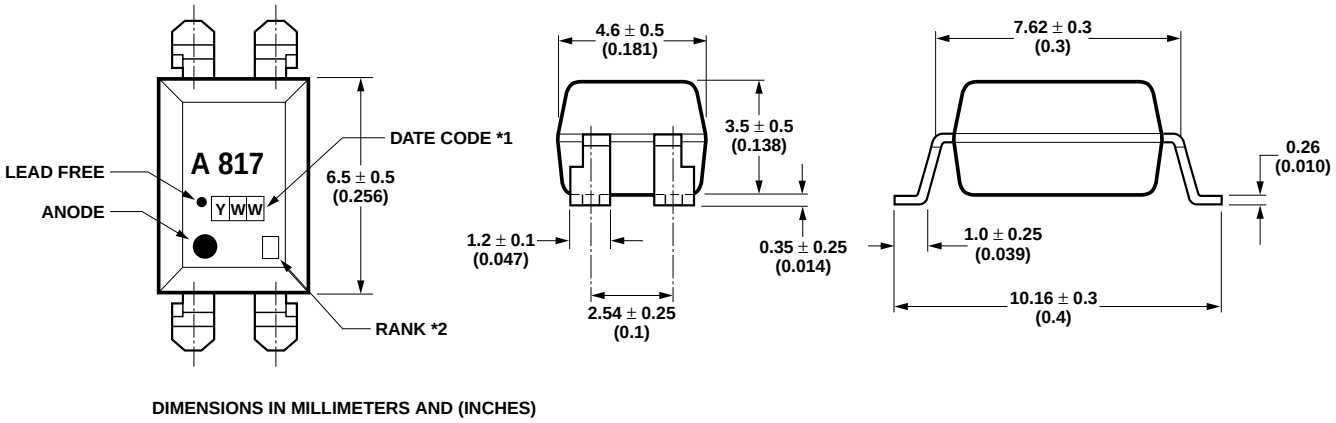
DIMENSIONS IN MILLIMETERS AND (INCHES)

HCPL-817-W00E



DIMENSIONS IN MILLIMETERS AND (INCHES)

HCPL-817-300E

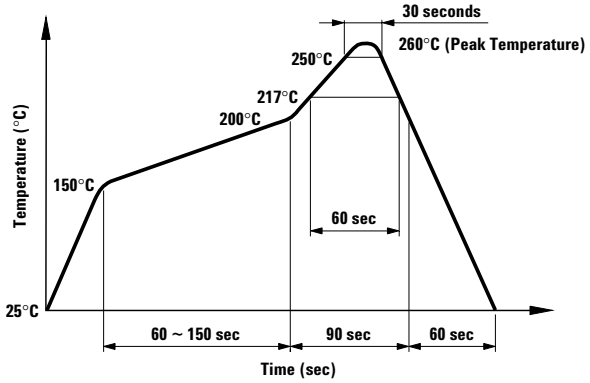


DIMENSIONS IN MILLIMETERS AND (INCHES)

Solder Reflow Temperature Profile

1) One-time soldering reflow is recommended within the condition of temperature and time profile shown at right.

2) When using another soldering method such as infrared ray lamp, the temperature may rise partially in the mold of the device. Keep the temperature on the package of the device within the condition of (1) above.



Absolute Maximum Ratings (T_A = 25°C)

Storage Temperature, T_S	–55°C to +125°C
Operating Temperature, T_A	–30°C to +100°C
Lead Solder Temperature, max. (1.6 mm below seating plane)	260°C for 10 s
Average Forward Current, I_F	50 mA
Reverse Input Voltage, V_R	6 V
Input Power Dissipation, P_I	70 mW
Collector Current, I_C	50 mA
Collector-Emitter Voltage, V_{CEO}	35 V
Emitter-Collector Voltage, V_{ECO}	6 V
Collector Power Dissipation	150 mW
Total Power Dissipation	200 mW
Isolation Voltage, V_{iso} (AC for 1 minute, R.H. = 40 ~ 60%)	5000 Vrms

Electrical Specifications (T_A = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Forward Voltage	V_F	–	1.2	1.4	V	I_F = 20 mA
Reverse Current	I_R	–	–	10	μA	V_R = 4 V
Terminal Capacitance	C_t	–	30	250	pF	V = 0, f = 1 KHz
Collector Dark Current	I_{CEO}	–	–	100	nA	V_{CE} = 20 V
Collector-Emitter Breakdown Voltage	BV_{CEO}	35	–	–	V	I_C = 0.1 mA
Emitter-Collector Breakdown Voltage	BV_{ECO}	6	–	–	V	I_E = 10 μA
Collector Current	I_C	2.5	–	30	mA	I_F = 5 mA, V_{CE} = 5 V,
*Current Transfer Ratio	CTR	50	–	600	%	R_{BE} = ∞
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	–	0.1	0.2	V	I_F = 20 mA, I_C = 1 mA
Response Time (Rise)	t_r	–	4	18	μs	V_{CC} = 2 V, I_C = 2 mA
Response Time (Fall)	t_f	–	3	18	μs	R_L = 100 Ω
Cut-off Frequency	f_c	–	80	–	KHz	V_{CC} = 5 V, I_C = 2 mA R_L = 100 Ω, –3 dB
Isolation Resistance	R_{iso}	5×10^{10}	1×10^{11}	–	Ω	DC 500 V 40 ~ 60% R.H.
Floating Capacitance	C_f	–	0.6	1.0	pF	V = 0, f = 1 MHz

* $CTR = \frac{I_C}{I_F} \times 100\%$

Rank Mark	CTR (%)	Conditions
L	50 ~ 100	I_F = 5 mA, V_{CE} = 5 V, T_A = 25°C
A	80 ~ 160	
B	130 ~ 260	
C	200 ~ 400	
D	300 ~ 600	

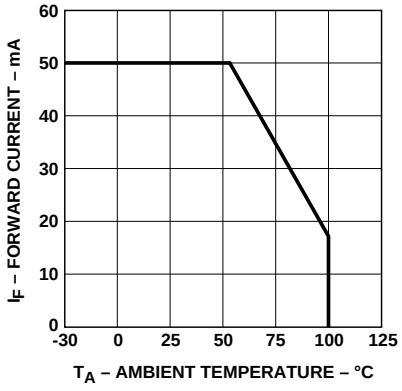


Figure 1. Forward current vs. temperature.

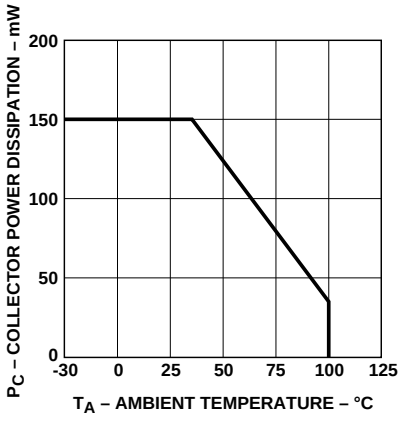


Figure 2. Collector power dissipation vs. temperature.

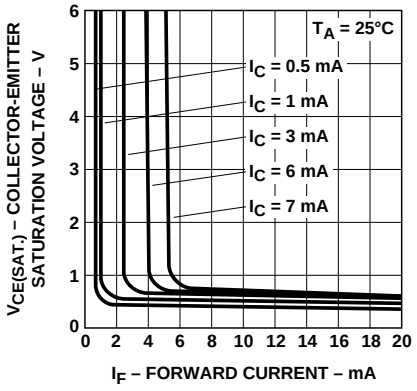


Figure 3. Collector-emitter saturation voltage vs. forward current.

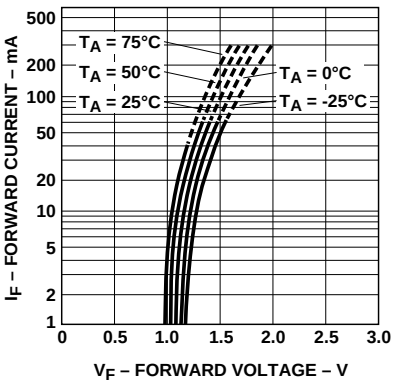


Figure 4. Forward current vs. forward voltage.

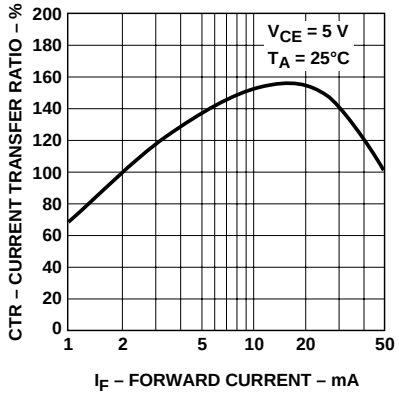


Figure 5. Current transfer ratio vs. forward current.

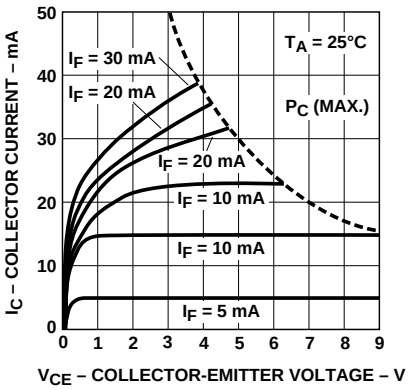


Figure 6. Collector current vs. collector-emitter voltage.

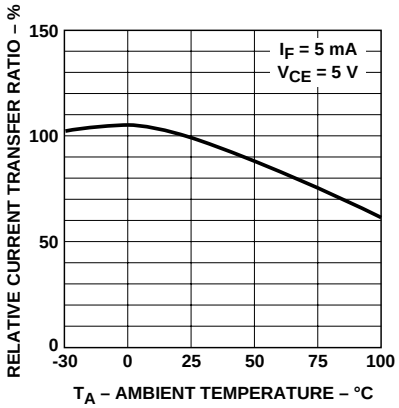


Figure 7. Relative current transfer ratio vs. temperature.

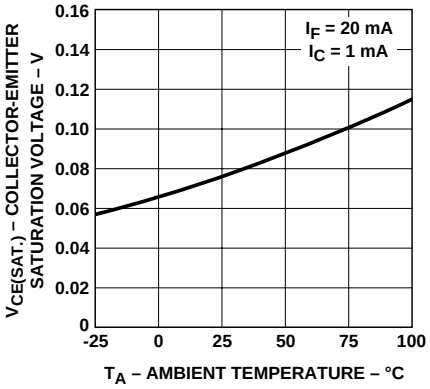


Figure 8. Collector-emitter saturation voltage vs. temperature.

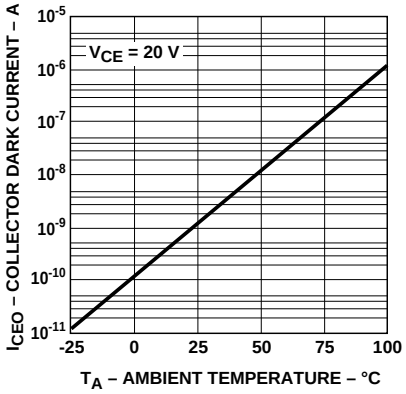


Figure 9. Collector dark current vs. temperature.

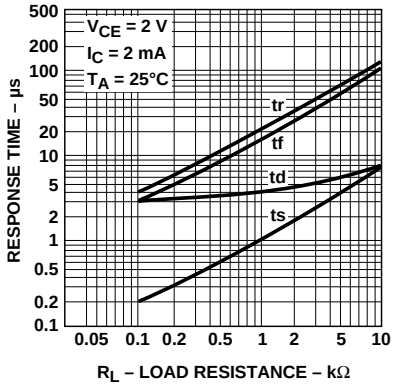


Figure 10. Response time vs. load resistance.

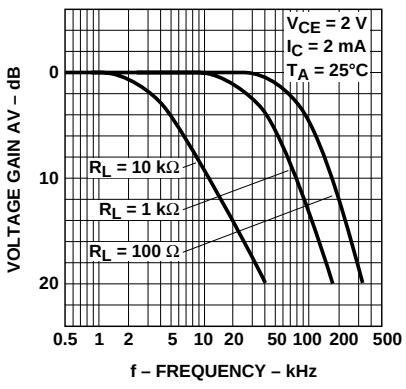
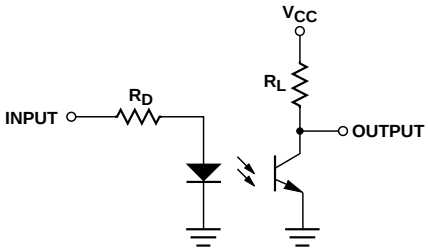
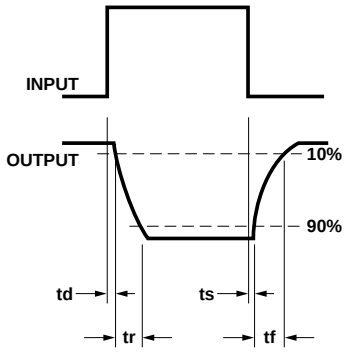


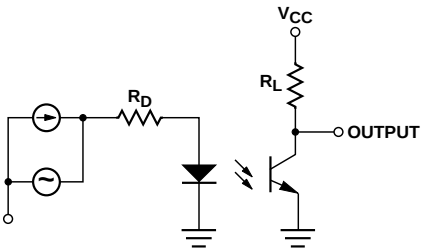
Figure 11. Frequency response.

Test Circuit for Response Time





Test Circuit for Frequency Response



www.agilent.com/semiconductors

For product information and a complete list of distributors, please go to our web site.

For technical assistance call:

Americas/Canada: +1 (800) 235-0312 or (916) 788-6763

Europe: +49 (0) 6441 92460

China: 10800 650 0017

Hong Kong: (+65) 6756 2394

India, Australia, New Zealand: (+65) 6755 1939

Japan: (+81 3) 3335-8152 (Domestic/International), or 0120-61-1280 (Domestic Only)

Korea: (+65) 6755 1989

Singapore, Malaysia, Vietnam, Thailand, Philippines, Indonesia: (+65) 6755 2044

Taiwan: (+65) 6755 1843

Data subject to change.

Obsoletes 5989-0293EN
October 27, 2004
5989-1734EN

Agilent Technologies

SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销 、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有 10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一,是一家专业代理和分銷世界各大品牌 IC 芯片和電子元器件的连锁经营綜合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商,已在全国范围内建成强大统一的供货和代理分销网络。 我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件： 晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适 配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

更多产品请看本公司产品专用销售网站:

商斯达微波光电产品网:HTTP://www.rfoe.net/

商斯达中国传感器科技信息网：http://www.sensor-ic.com/

商斯达工控安防网：http://www.pc-ps.net/

商斯达电子元器件网：http://www.sunstare.com/

商斯达消费电子产品网://www.icasic.com/

商斯达实业科技产品网://www.sunstars.cn/ *射频微波光电元器件销售热线:*

地址：深圳市福田区福华路福庆街鸿图大厦 1602 室

电话：0755-83396822 83397033 83398585 82884100

传真：0755-83376182 （0）13823648918 MSN: SUNS8888@hotmail.com

邮编：518033 E-mail:szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场 2583 号 电话：0755-83665529 25059422

技术支持: 0755-83394033 13501568376

欢迎索取免费详细资料、设计指南和光盘 ；产品凡多，未能尽录，欢迎来电查询。

北京分公司：北京海淀区知春路 132 号中发电子大厦 3097 号

TEL：010-81159046 82615020 13501189838 FAX：010-62543996

上海分公司：上海市北京东路 668 号上海赛格电子市场 D125 号

TEL：021-28311762 56703037 13701955389 FAX：021-56703037

西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL：029-81022619 13072977981 FAX:029-88789382