2SC2735

Silicon NPN Epitaxial

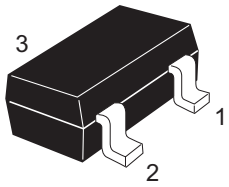
REJ03G0706-0200
(Previous ADE-208-1075)
Rev.2.00
Aug.10.2005

Application

UHF/VHF Local oscillator, frequency converter

Outline

RENESAS Package code: PLSP0003ZB-A
(Package name: MPAK)



1. Emitter
2. Base
3. Collector

Note: Marking is “JC”.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	30	V
Collector to emitter voltage	V_{CEO}	20	V
Emitter to base voltage	V_{EBO}	3	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

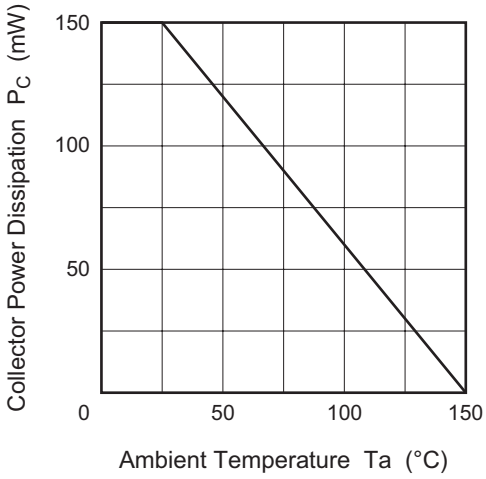
Electrical Characteristics

(Ta = 25°C)

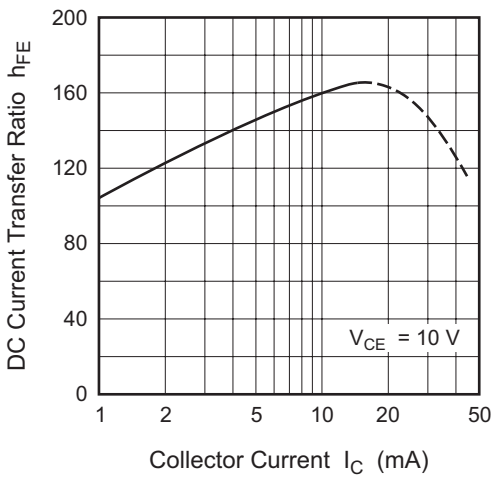
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	I_C = 10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	I_C = 1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	3	—	—	V	I_E = 10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	0.5	µA	V_{CB} = 10 V, I_C = 0
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.0	V	I_C = 20 mA, I_B = 4 mA
DC current transfer ratio	h_{FE}	40	—	—		V_{CE} = 10 V, I_C = 10 mA
Collector output capacitance	Cob	—	0.85	1.5	pF	V_{CB} = 10 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	600	1200	—	MHz	V_{CE} = 10 V, I_C = 10 mA
Oscillating output voltage	V_{OSC1}	—	210	—	mV	V_{CC} = 12 V, I_C = 7 mA, f_{OSC} = 300 MHz
	V_{OSC2}	—	130	—	mV	V_{CC} = 12 V, I_C = 7 mA, f_{OSC} = 930 MHz
Conversion gain	CG	—	21	—	dB	V_{CC} = 12 V, I_C = 2 mA, f = 200 MHz, f_{OSC} = 230 MHz (0dBm)
Noise figure	NF	—	6.5	—	dB	V_{CC} = 12 V, I_C = 2 mA, f = 200 MHz, f_{OSC} = 230 MHz (0dBm)

Main Characteristics

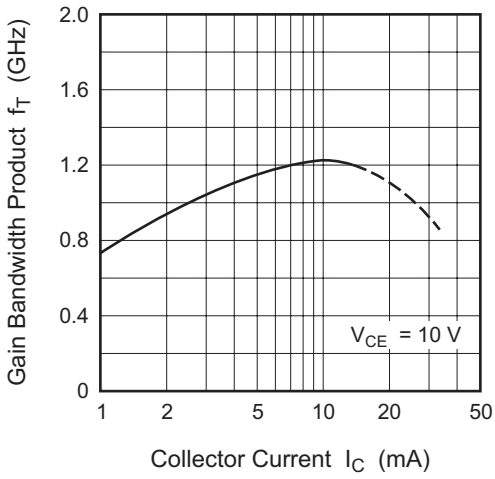
Maximum Collector Dissipation Curve



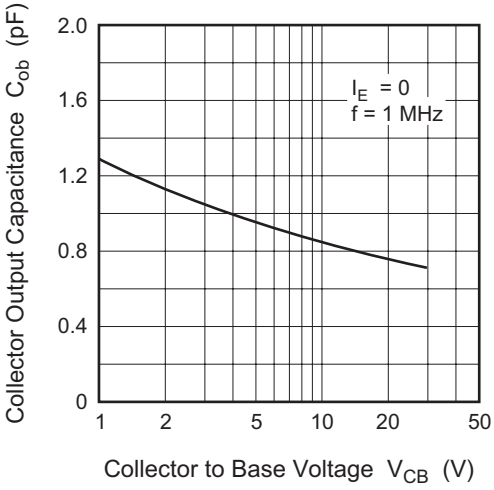
DC Current Transfer Ratio vs. Collector Current



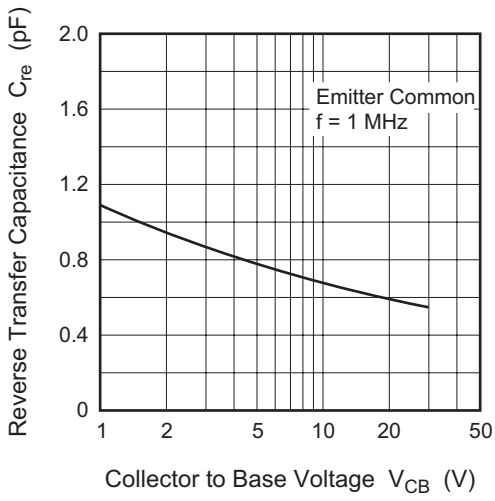
Gain Bandwidth Product vs. Collector Current



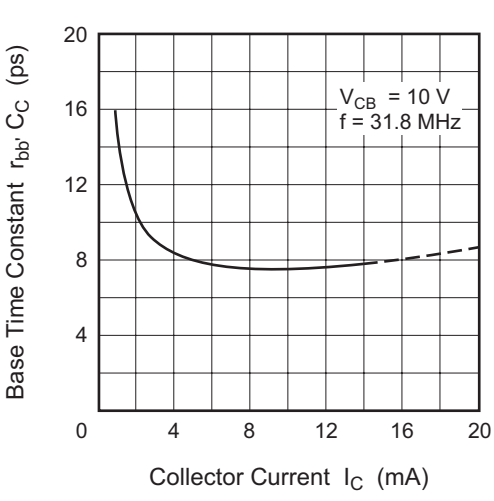
Collector Output Capacitance vs. Collector to Base Voltage



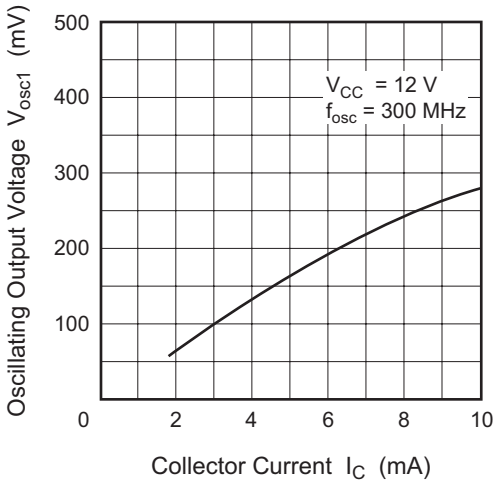
Reverse Transfer Capacitance vs. Collector to Base Voltage



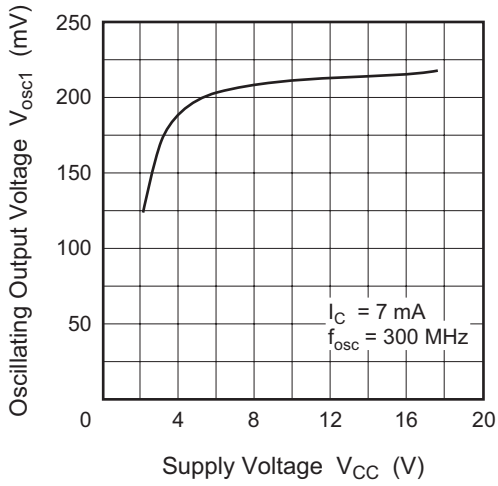
Base Time Constant vs. Collector Current



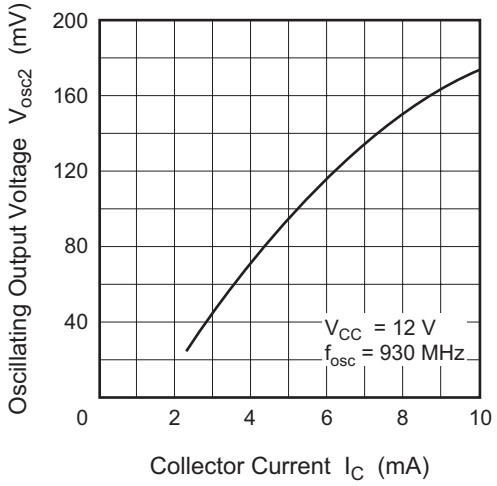
Oscillating Output Voltage vs. Collector Current



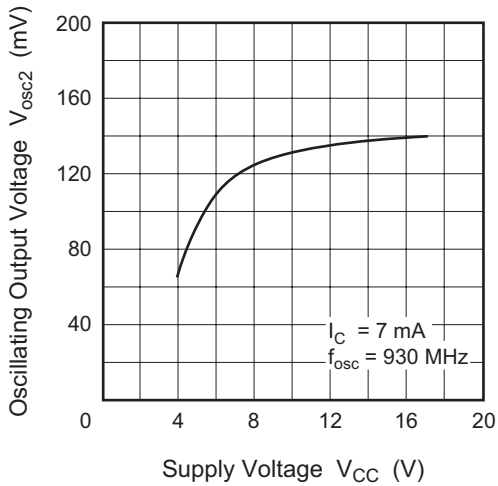
Oscillating Output Voltage vs. Supply Voltage



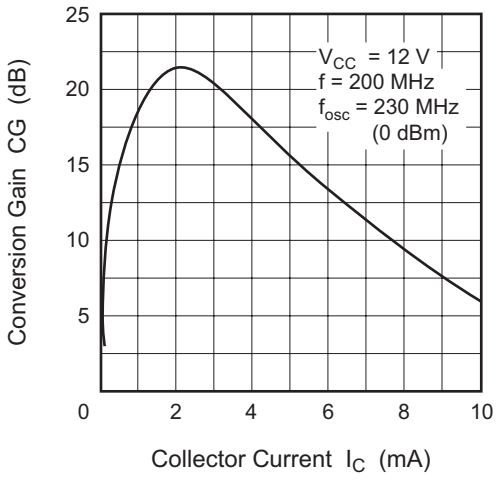
Oscillating Output Voltage vs. Collector Current



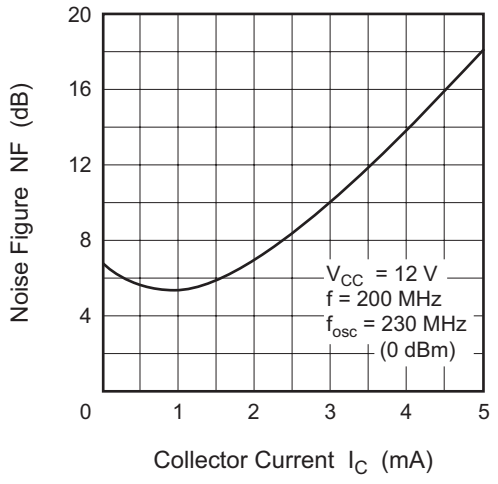
Oscillating Output Voltage vs. Supply Voltage



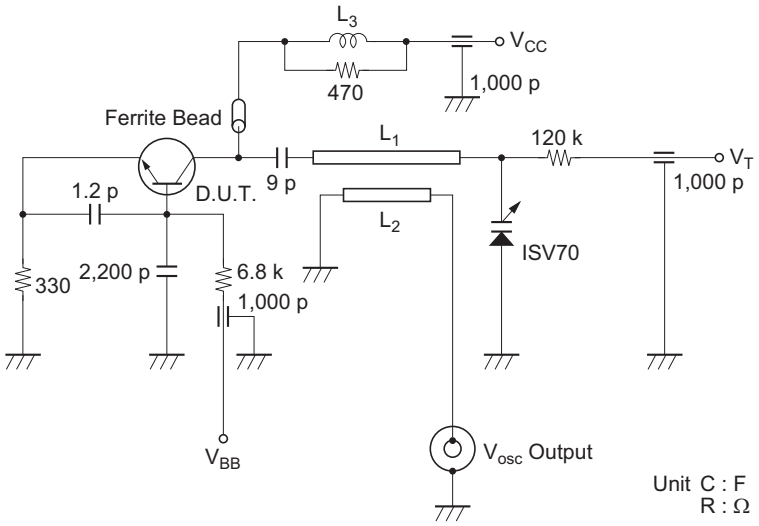
Conversion Gain vs. Collector Current

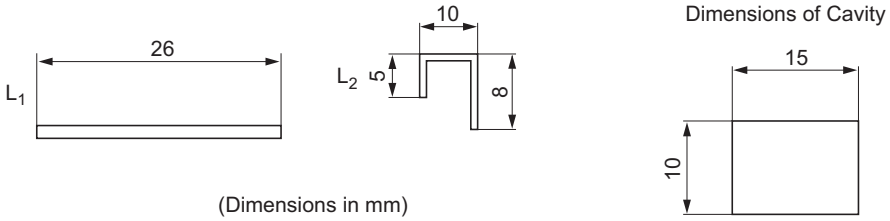


Noise Figure vs. Collector Current



V_{OSC2} UHF Oscillating Output Voltage Test Circuit





(Dimensions in mm)

(Dimensions in mm)

L_1 : Polyurethane Coated Copper Wire ϕ1.0 mm

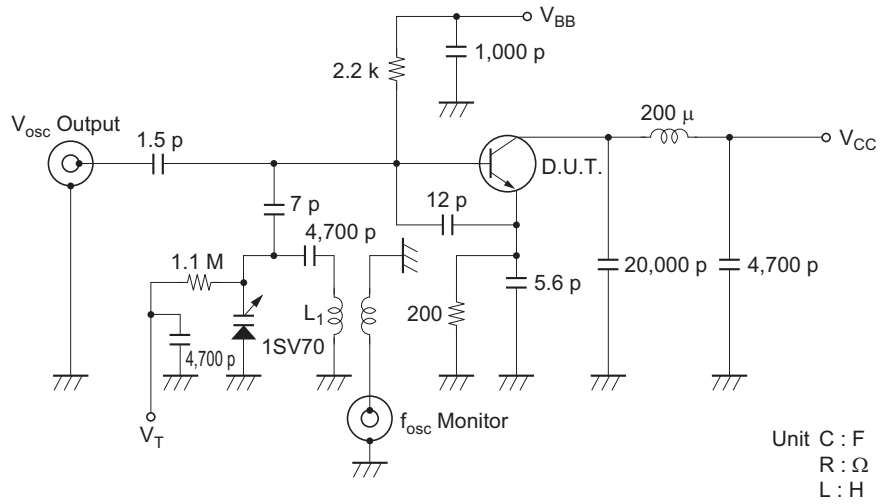
L_2 : Polyurethane Coated Copper Wire ϕ0.8 mm

L_3 : ϕ0.3 mm Enameled Copper wire, 10 Turns with 470 Ω (1/4W)Resistor.

Test Frequency : f_{osc} = 930 MHz

Test Equipment : YHP 4271A Vector Voltmeter

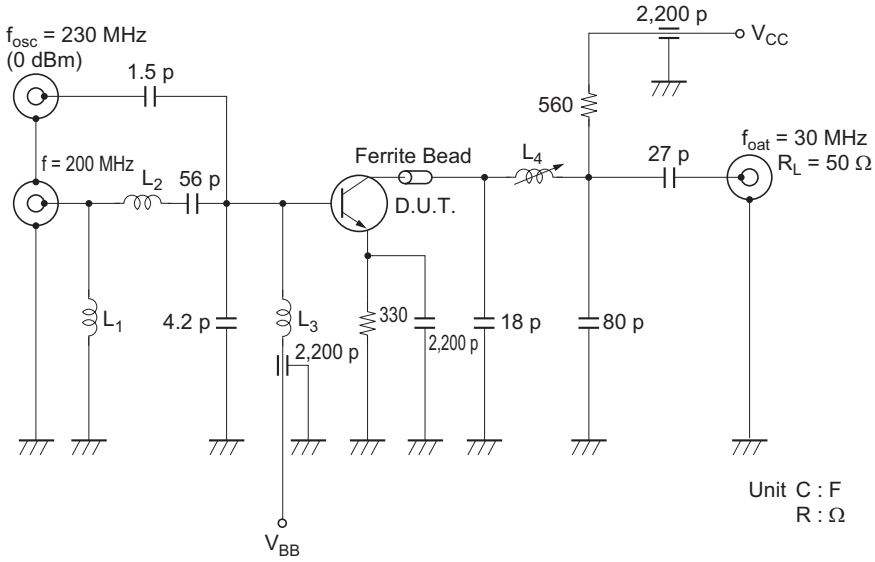
V_{OSC1} VHF Oscillating Output Voltage Test Circuit



L_1 : Inside dia ϕ3 mm, ϕ3 mm Enameled Copper Wire 12 Turns

Test Frequency : f_{osc} = 300 MHz

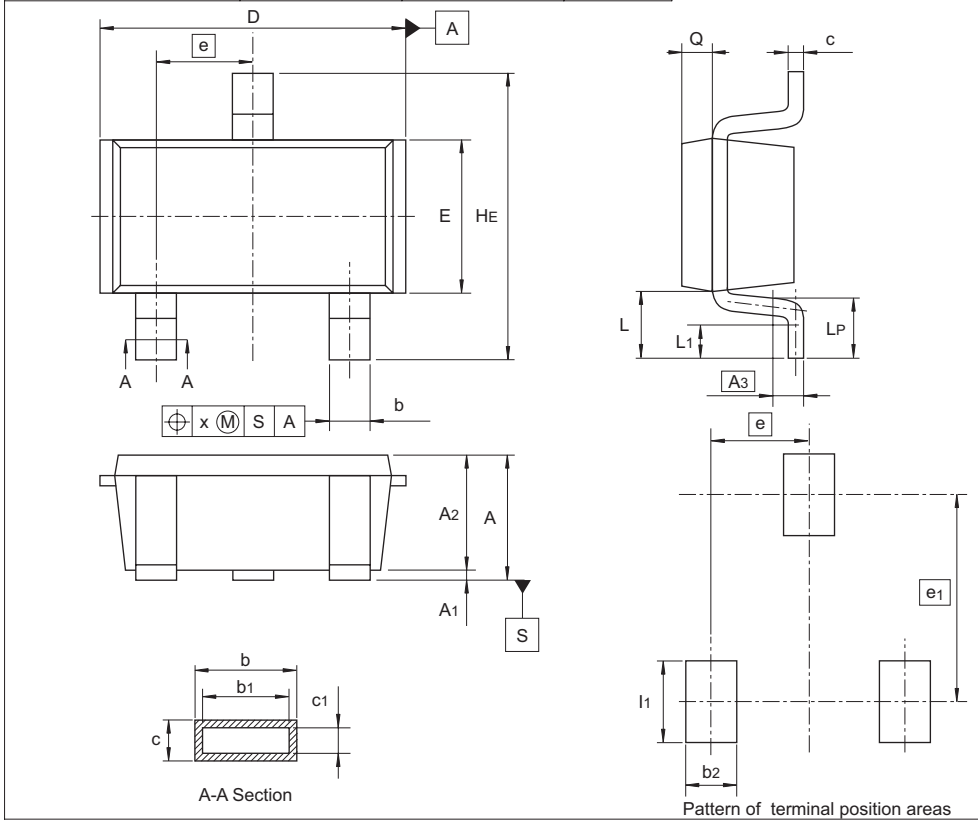
VHF Conversion Gain : Noise Figure Test Circuit



L_1 : Inside dia ϕ5 mm, ϕ0.5 mm Enameled Copper Wire 4 Turns
L_2 : Inside dia ϕ4 mm, ϕ0.5 mm Enameled Copper Wire 4 Turns
L_3 : Inside dia ϕ3 mm, ϕ0.2 mm Enameled Copper Wire 6 Turns
L_4 : Outside dia ϕ5 mm Bobbin, ϕ0.2 mm Enameled Copper Wire 16 Turns, using Ferrite bead.

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-59A	PLSP0003ZB-A	MPAK(T) / MPAK(T)V, MPAK / MPAKV	0.011g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	1.0	—	1.3
A_1	0	—	0.1
A_2	1.0	1.1	1.2
A_3	—	0.25	—
b	0.35	0.42	0.5
b_1	—	0.4	—
c	0.1	0.13	0.15
c_1	—	0.11	—
D	2.7	—	3.1
E	1.35	1.5	1.65
e	—	0.95	—
H_E	2.2	2.8	3.0
L	0.35	—	0.75
L_1	0.15	—	0.55
L_P	0.25	—	0.65
x	—	—	0.05
b_2	—	—	0.55
e_1	—	1.95	—
l_1	—	—	1.05
Q	—	0.3	—

Ordering Information

Part Name	Quantity	Shipping Container
2SC2735JTL-E	3000	ϕ 178 mm Reel, 8 mm Emboss Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

Renesas Technology Malaysia Sdn. Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510

Colophon .3.0