优尚

YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码　　企业QQ二维码

Features & Benefits

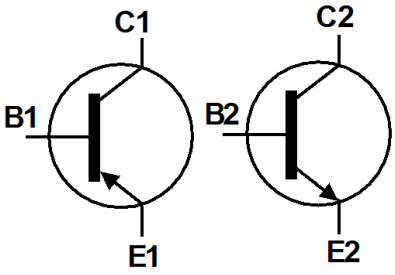
- Complementary Pairs:
  - One 2222A Type (NPN)
  - One 2907A Type (PNP)
- Ideal for Low-Power Amplification and Switching

Mechanical Data

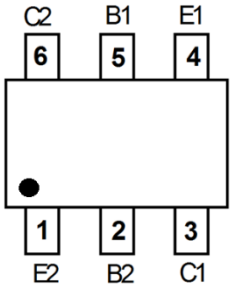
- Package: SOT363
- Package Material: Molded Plastic, “Green” Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (approximate)

SOT363

Top View



Device Symbol



Top View
Pin-Out

Maximum Ratings, 2222A Type (NPN) (@ T_{amb} = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	600	mA

Maximum Ratings, 2907A Type (PNP) (@ T_{amb} = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-60	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-6	V
Continuous Collector Current	I_C	-600	mA

Thermal Characteristics (@ T_{amb} = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	200	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	625	°C/W
Thermal Resistance, Junction to Case	(Note 6)	$R_{\theta JC}$	150	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes: 5. For the device mounted on minimum recommended pad layout FR-4, device is measured under still air conditions whilst operating in a steady-state.
6. Thermal resistance from junction to the top of package.
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristic and Derating Information

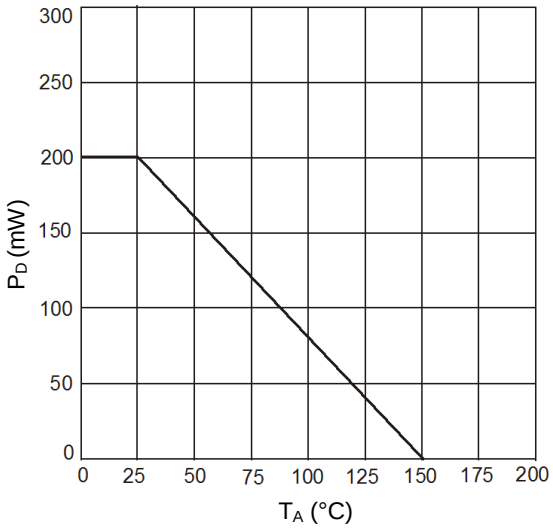


Figure 1. P_D v T_A

Electrical Characteristics, 2222A Type (NPN) (@ T_{amb} = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)					
Collector-Base Breakdown Voltage	BV_{CBO}	75	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	—	10	nA μA	V_{CB} = 60V V_{CB} = 60V, T_{amb} = +150°C
Collector Cutoff Current	I_{CEX}	—	10	nA	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V
Emitter Cutoff Current	I_{EBO}	—	10	nA	V_{EB} = 5.0V
Base Cutoff Current	I_{BL}	—	20	nA	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V
ON CHARACTERISTICS (Note 8)					
DC Current Gain	h_{FE}	35 50 75 100 40 50 35	— — — 300 — — —	—	I_C = 100μA, V_{CE} = 10V I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V I_C = 150mA, V_{CE} = 10V I_C = 500mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V, T_{amb} = -55°C I_C = 150mA, V_{CE} = 1V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.3 1.0	V	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	0.6 —	1.2 2.0	V	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	8	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{ibo}	—	25	pF	V_{EB} = 0.5V, f = 1MHz
Current Gain-Bandwidth Product	f_T	300	—	MHz	V_{CE} = 20V, I_C = 20mA, f = 100MHz
Noise Figure	NF	—	4.0	dB	V_{CE} = 10V, I_C = 100μA, R_S = 1kΩ, f = 1kHz
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	10	ns	V_{CC} = 30V, I_C = 150mA,
Rise Time	t_r	—	25	ns	$V_{BE(off)}$ = - 0.5V, I_{B1} = 15mA
Storage Time	t_s	—	225	ns	V_{CC} = 30V, I_C = 150mA,
Fall Time	t_f	—	60	ns	I_{B1} = -I_{B2} = 15mA

Note: 8. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

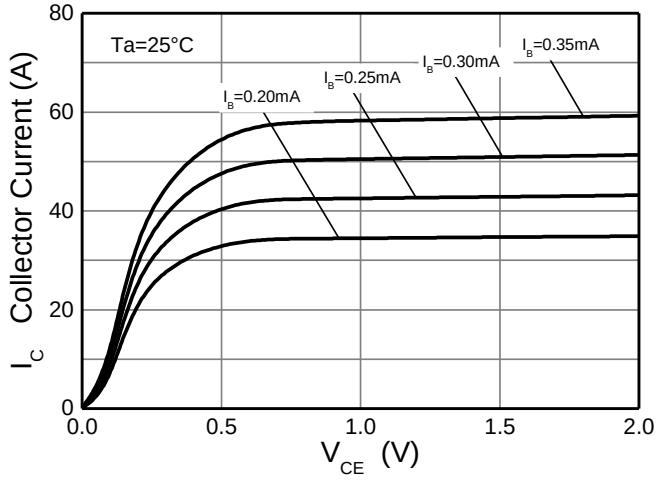


Figure 2. I_C v V_{CE}

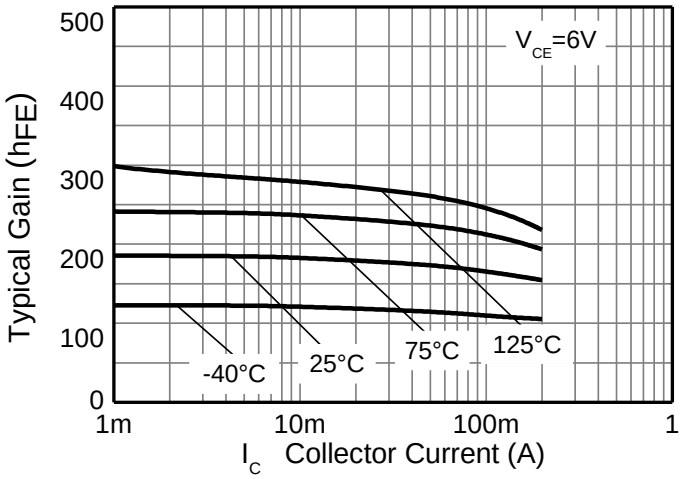


Figure 3. h_{FE} v I_C

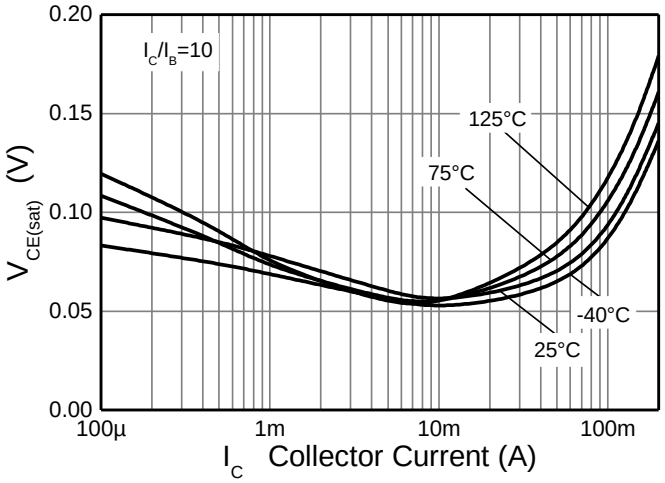


Figure 4. $V_{CE(sat)}$ v I_C

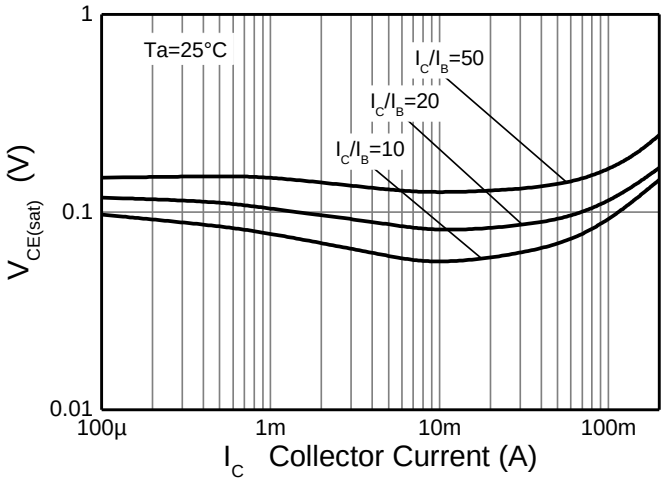


FIgure 5. $V_{CE(sat)}$ v I_C

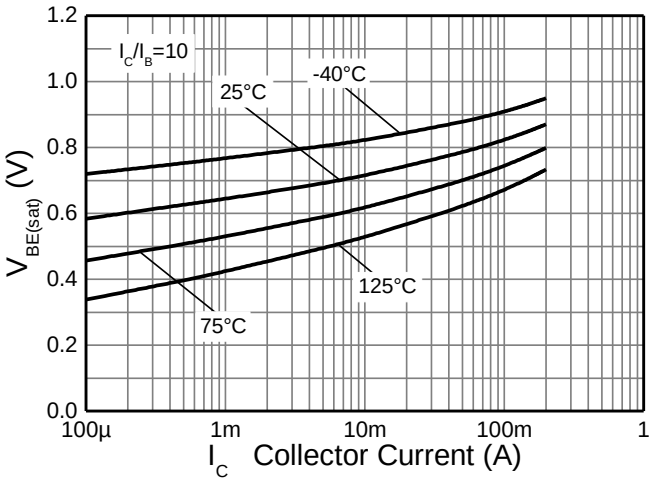


Figure 6. $V_{BE(sat)}$ v I_C

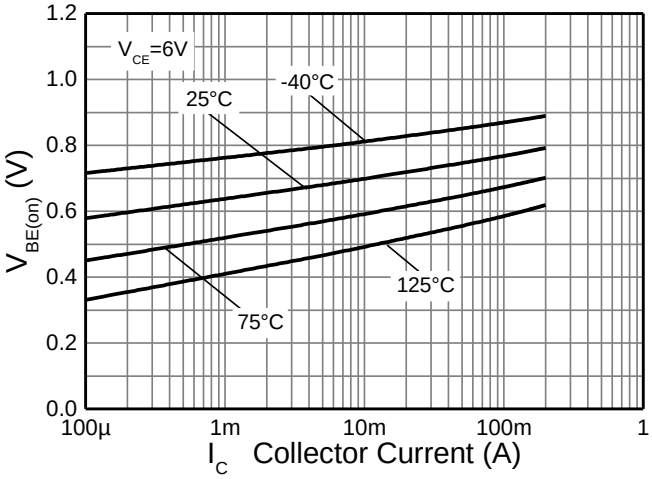


Figure 7. $V_{BE(on)}$ v I_C

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

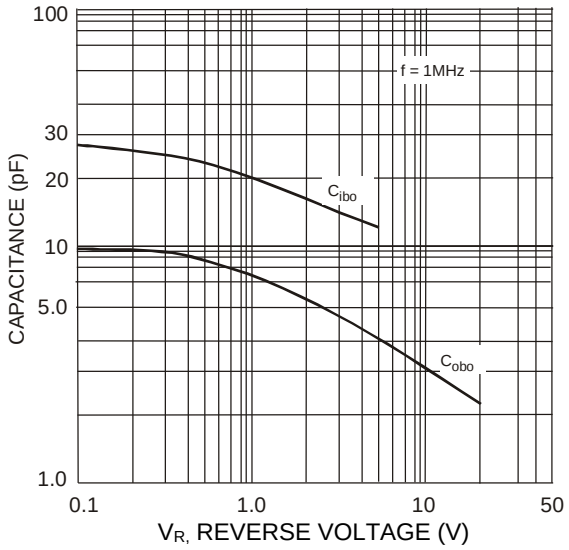


Figure 8. Capacitance v V_R

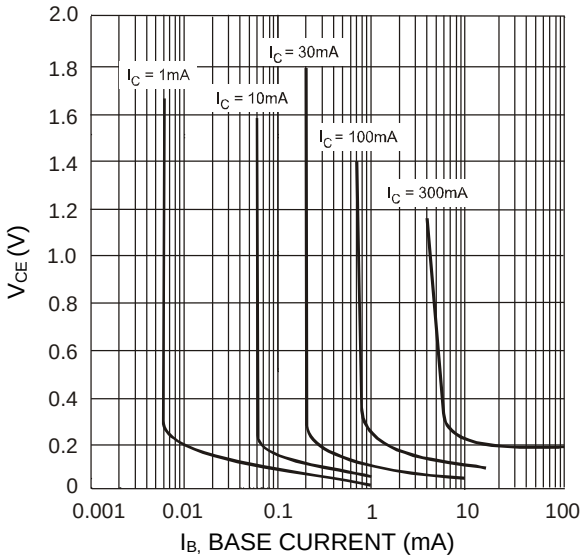


Figure 9. V_{CE} v I_B

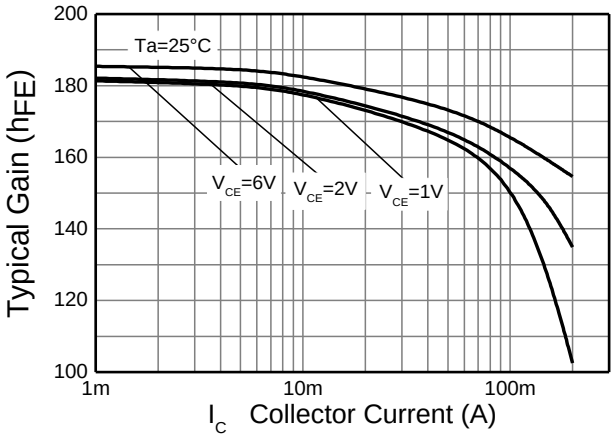


Figure 10. h_{FE} v I_C

Electrical Characteristics, 2907A Type (PNP) (@T_{amb} = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)					
Collector-Base Breakdown Voltage	BV_{CBO}	-60	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	-60	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-6.0	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	—	-10	nA μA	V_{CB} = -50V V_{CB} = -50V, T_{amb} = +125°C
Collector Cutoff Current	I_{CEX}	—	-50	nA	V_{CE} = -30V, $V_{EB(off)}$ = -0.5V
Base Cutoff Current	I_{BL}	—	-50	nA	V_{CE} = -30V, $V_{EB(off)}$ = -0.5V
ON CHARACTERISTICS (Note 9)					
DC Current Gain	h_{FE}	75 100 100 100 50	— — — 300 —	—	I_C = -100μA, V_{CE} = -10V I_C = -1.0mA, V_{CE} = -10V I_C = -10mA, V_{CE} = -10V I_C = -150mA, V_{CE} = -10V I_C = -500mA, V_{CE} = -10V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-0.4 -1.6	V	I_C = -150mA, I_B = -15mA I_C = -500mA, I_B = -50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	-1.3 -2.6	V	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	8.0	pF	V_{CB} = -10V, f = 1MHz
Input Capacitance	C_{ibo}	—	30	pF	V_{EB} = -2V, f = 1MHz
Current Gain-Bandwidth Product	f_T	200	—	MHz	V_{CE} = -20V, I_C = -50mA, f = 100MHz
SWITCHING CHARACTERISTICS					
Turn-On Time	t_{on}	—	45	ns	—
Delay Time	t_d	—	10	ns	V_{CC} = -30V, I_C = -150mA, I_{B1} = -15mA
Rise Time	t_r	—	40	ns	
Turn-Off Time	t_{off}	—	100	ns	—
Storage Time	t_s	—	80	ns	V_{CC} = -6V, I_C = -150mA, I_{B1} = I_{B2} = -15mA
Fall Time	t_f	—	30	ns	

Note: 9. Short duration pulse test used to minimize self-heating effect.

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

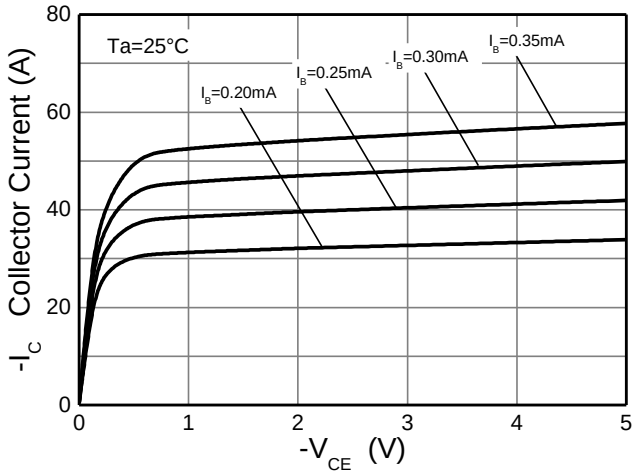


Figure 11. I_C v V_{CE}

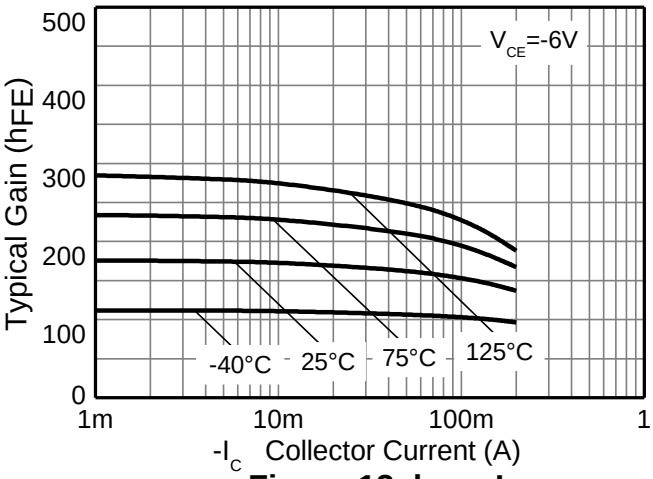


Figure 12. h_{FE} v I_C

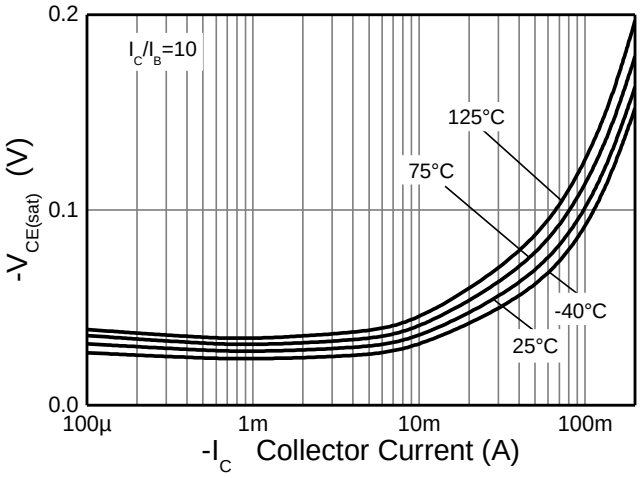


Figure 13. $V_{CE(sat)}$ v I_C

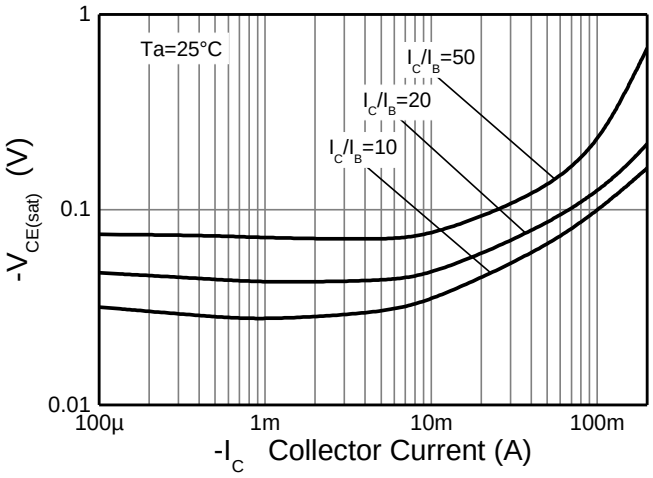


Figure 14. $V_{CE(sat)}$ v I_C

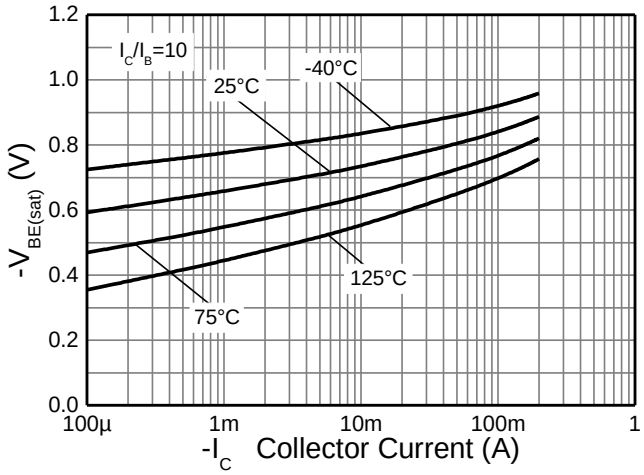


Figure 15. $V_{BE(sat)}$ v I_C

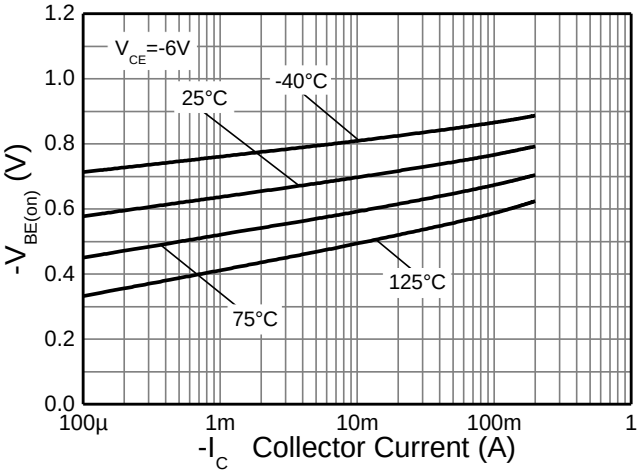


Figure 16. $V_{BE(on)}$ v I_C

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

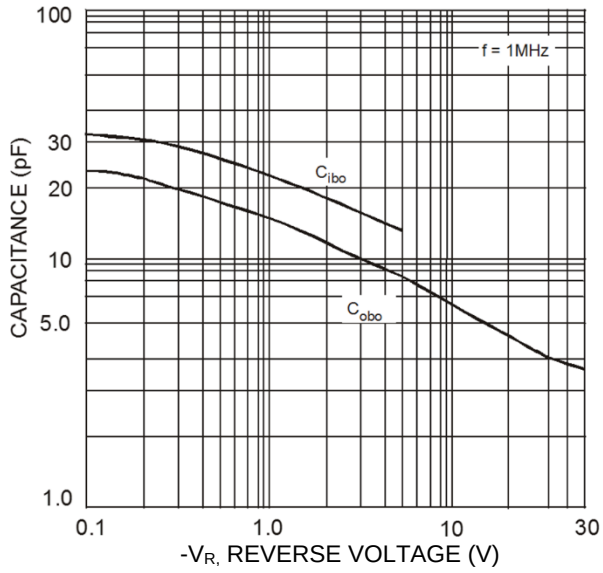


Figure 17. Capacitance v V_R

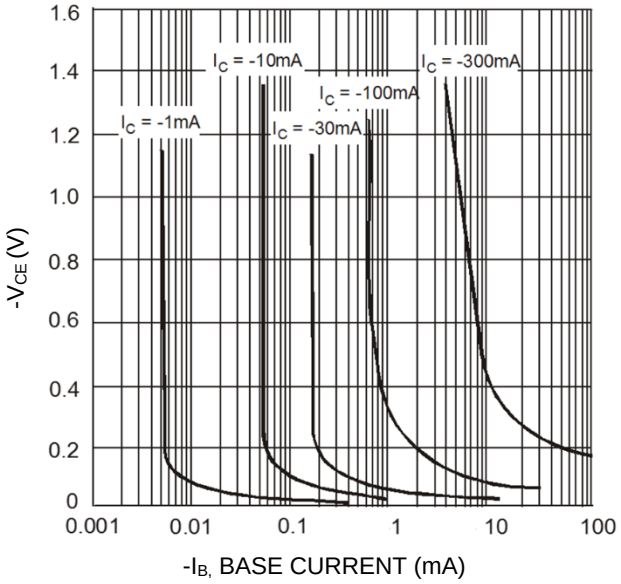


Figure 18. V_{CE} v I_B

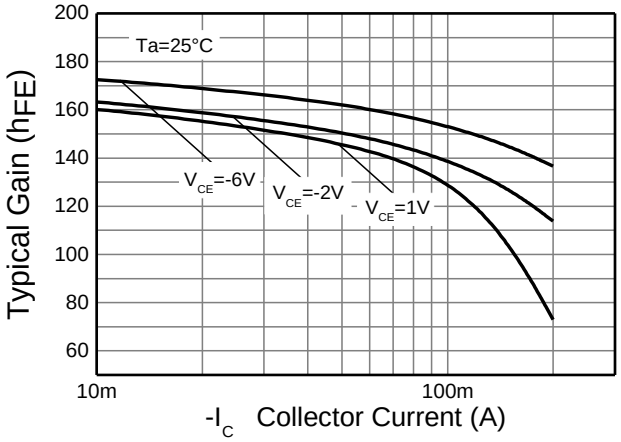
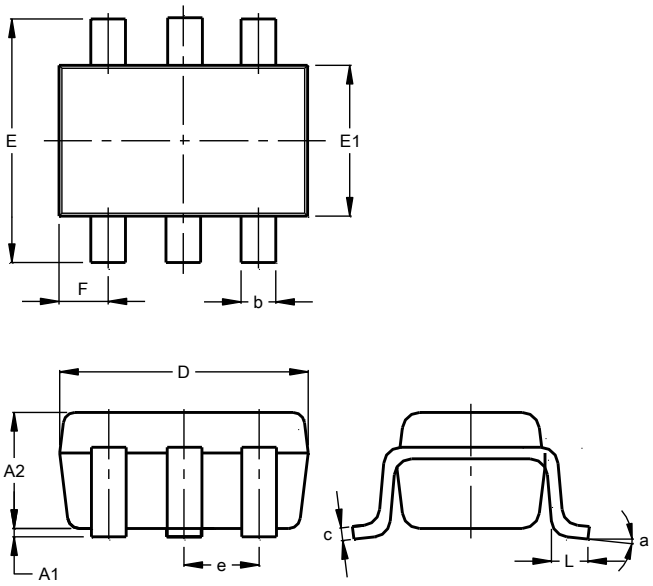


Figure 19. h_{FE} v I_C

Package Outline Dimensions

SOT363

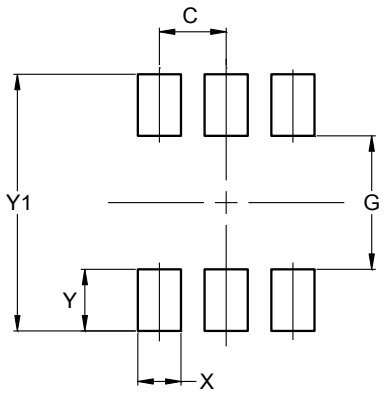


SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

-

SOT363



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500