NEC

NPN SILICON TRANSISTOR
2SC3615

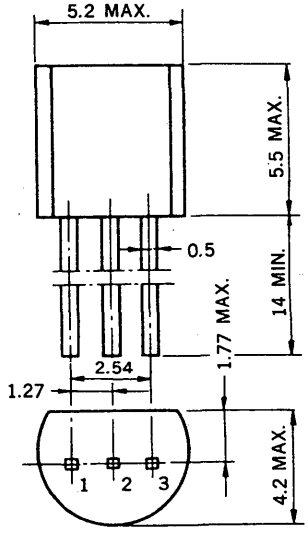
DESCRIPTION

The 2SC3615 is designed for general-purpose applications requiring High DC Current Gain.
This is suitable for all kind of driving, instead of Darlington Transistor, or muting.

FEATURES

- High DC Current Gain.
  h_{FE} = 800 to 3200 (@ V_{CE} = 5.0 V, I_C = 100 mA)
- Low Collector Saturation Voltage.
  $V_{CE(sat)}$ = 0.11 V TYP. (@ I_C/I_B = 100 mA/1.0 mA)
- High V_{EBO} : V_{EBO} = 15 V
- High Total Power Dissipation. : P_T = 0.75 W (@ T_a = 25 °C)

PACKAGE DIMENSIONS
in millimeters (inches)



1. Emitter
2. Collector
3. Base

EIAJ : SC-43B
JEDEC : TO-92
IEC : PA33

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures
- Storage Temperature . . . . . −55 to +150 °C
- Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T_a = 25 °C)
- Total Power Dissipation . . . . . 0.75 W

Maximum Voltages and Currents (T_a = 25 °C)

V_{CBO}	Collector to Base Voltage	50	V
V_{CEO}	Collector to Emitter Voltage	50	V
V_{EBO}	Emitter to Base Voltage	15	V
I_C	Collector Current (DC)	300	mA
I_C	Collector Current (pulse)*	500	mA

*PW ≦ 10 ms, Duty Cycle ≦ 50 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}	DC Current Gain	800		3200	–	V_{CE} = 5.0 V, I_C = 100 mA
h_{FE2}	DC Current Gain	640			–	V_{CE} = 5.0 V, I_C = 300 mA
f_T	Gain Bandwidth Product	150	220		MHz	V_{CE} = 5.0 V, I_E = −100 mA
C_{ob}	Output Capacitance		8.0		pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz
I_{CBO}	Collector Cutoff Current			100	nA	V_{CB} = 50 V, I_E = 0
I_{EBO}	Emitter Cutoff Current			100	nA	V_{EB} = 10 V, I_C = 0
V_{BE}	Base to Emitter Voltage	600		700	mV	V_{CE} = 5.0 V, I_C = 100 mA
$V_{CE(sat)}$	Collector Saturation Voltage		0.11	0.3	V	I_C = 100 mA, I_B = 1.0 mA
$V_{BE(sat)}$	Base Saturation Voltage		0.7	1.2	V	I_C = 100 mA, I_B = 1.0 mA
t_{on}	Turn-On Time		0.15		μs	(V_{CC} = 10 V, $V_{BE(off)}$ ≒ −2.7 V, I_C = 200 mA, I_{B1} = −I_{B2} = 4.0 mA)
t_{stg}	Storage Time		0.75		μs	
t_{off}	Turn-Off Time		1.1		μs	

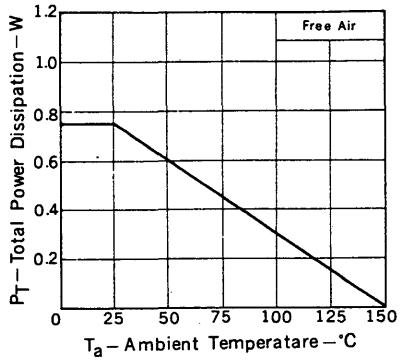
Classification of h_{FE1}

Rank	M	L	K
Range	800 to 1600	1200 to 2400	2000 to 3200

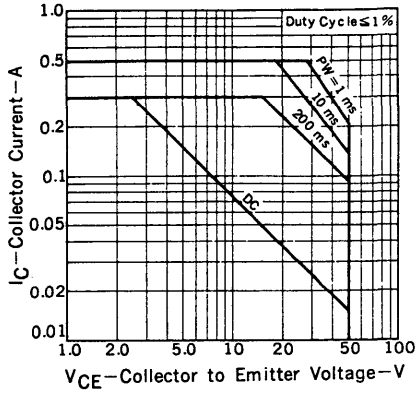
Test Conditions: V_{CE} = 5.0 V, I_C = 100 mA

TYPICAL CHARACTERISTICS (T_a = 25 °C)

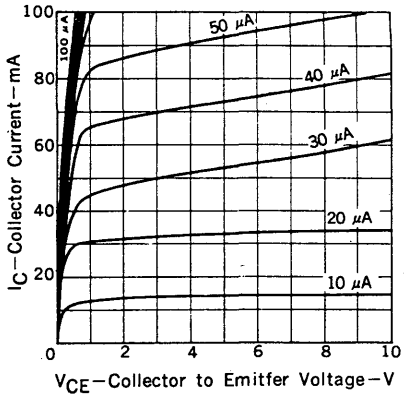
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



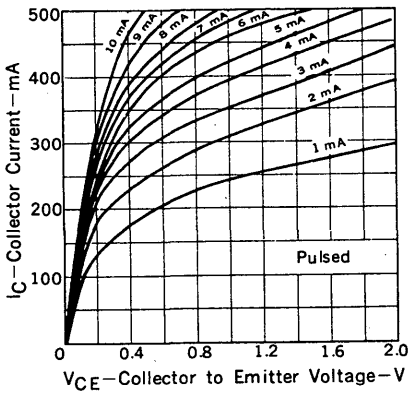
SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)



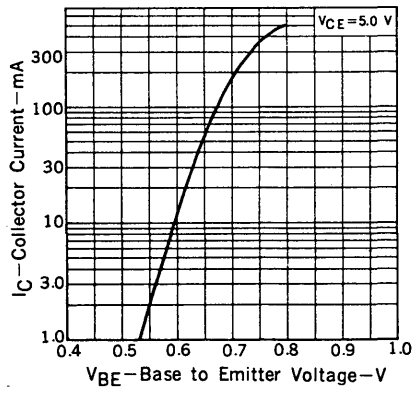
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



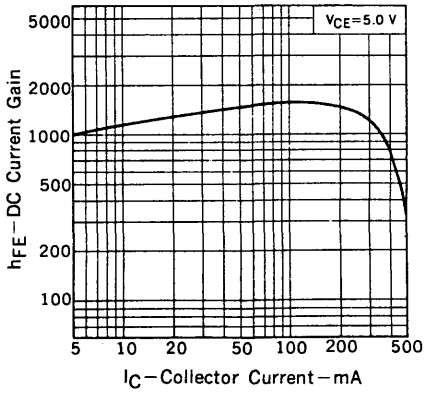
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



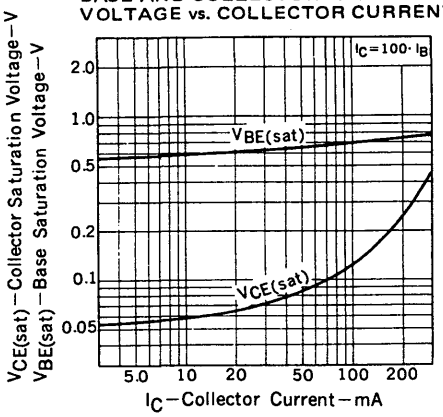
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



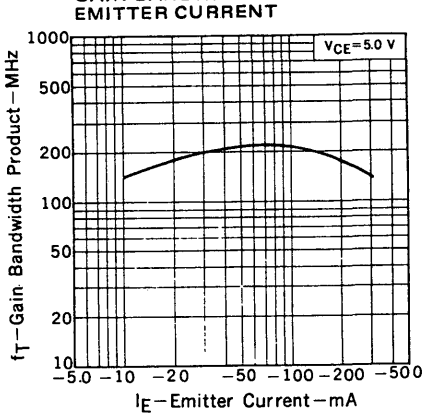
DC CURRENT GAIN vs. COLLECTOR CURRENT



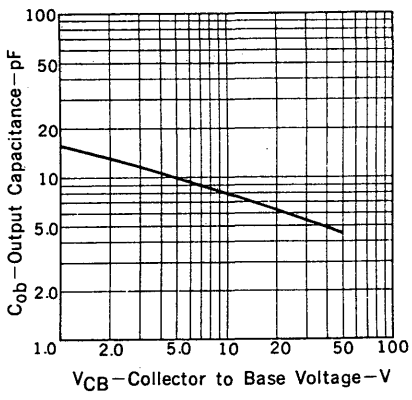
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



SWITCHING TIME vs.
COLLECTOR CURRENT