DARLINGTON COPLEMENTARY
SILICON POWER TRANSISTORS

...designed for general-purpose amplifier and low-speed switching applications

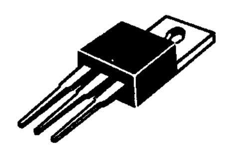
FEATURES:

- * Collector-Emitter Sustaining Voltage-
  $V_{CEO(SUS)}$ = 60 V (Min) - 2N6040 , 2N6043
  = 80 V (Min) - 2N6041 , 2N6044
  = 100 V (Min) - 2N6042 , 2N6045
- * Collector-Emitter Saturation Voltage
  $V_{CE(sat)}$ = 2.0 V (Max.) @ I_C = 4.0 A -2N6040, 41 , 2N6043,44
  = 2.0 V (Max.) @ I_C = 4.0 A -2N6042, 2N6045
- * Monolithic Construction with Built-in Base-Emitter Shunt Resistor

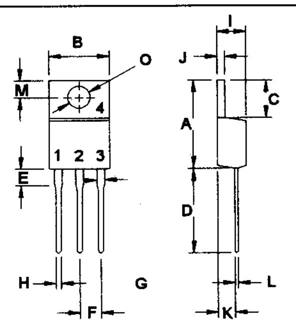
Boca Semicondcutor Corp. (BSC)

PNP	NPN
2N6040	2N6043
2N6041	2N6044
2N6042	2N6045

10 AMPERE
DARLINGTON
COMPLEMENTARY SILICON
POWER TRANSISTORS
60-100 VOLTS
80 WATTS



TO-220



PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

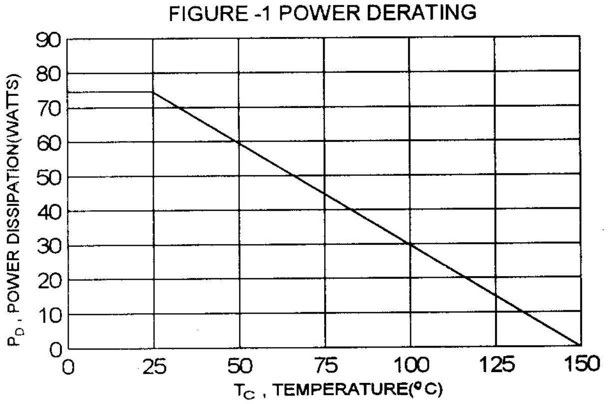
MAXIMUM RATINGS

Characteristic	Symbol	2N6040 2N6043	2N6041 2N6044	2N6042 2N6045	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	100	V
COllector-Base Voltage	V_{CBO}	60	80	100	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	8.0 16			A
Base Current	I_B	120			mA
Total Power Dissipation @T_C= 25°C Derate above 25°C	P_D	75 0.6			W W/°C
Operating and Storage Junction Temperature Range	T_J ,T_{STG}	- 65 to +150			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.67	°C/W

FIGURE -1 POWER DERATING



http://www.bocasemi.com

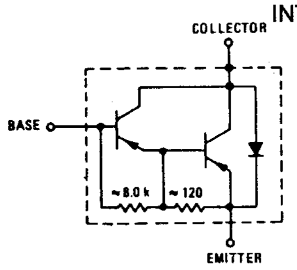
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector - Emitter Sustaining Voltage (1) (I_C = 30 mA, I_B = 0)	 2N6040, 2N6043 2N6041, 2N6044 2N6042, 2N6045	$V_{CEO(sus)}$	 60 80 100		V
Collector Cutoff Current (V_{CE} = 30 V, I_B = 0) (V_{CE} = 40 V, I_B = 0) (V_{CE} = 50 V, I_B = 0)	 2N6040, 2N6043 2N6041, 2N6044 2N6042, 2N6045	I_{CEO}		 0.5 0.5 0.5	mA
Collector Cutoff Current (V_{CB} = 60 V, I_E = 0) (V_{CB} = 80 V, I_E = 0) (V_{CB} = 100 V, I_E = 0)	 2N6040, 2N6043 2N6041, 2N6044 2N6042, 2N6045	I_{CBO}		 0.5 0.5 0.5	mA
Emitter Cutoff Current (V_{EB} = 5.0 V, I_C = 0)		I_{EBO}		2.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 4.0 A, V_{CE} = 4.0 V) (I_C = 3.0 A, V_{CE} = 4.0 V) (I_C = 8.0 A, V_{CE} = 4.0 V)	 2N6040,41/ 2N6043,44 2N6042, 2N6045 All Types	hFE	 1000 1000 100	 20000 20000	
Collector-Emitter Saturation Voltage (I_C = 4.0 A, I_B = 16 mA) (I_C = 3.0 A, I_B = 12 mA) (I_C = 8.0 A, I_B = 80 mA)	 2N6040,41/ 2N6043,44 2N6042, 2N6045 All Types	$V_{CE(sat)}$		 2.0 2.0 4.0	V
Base-Emitter Saturation Voltage (I_C = 8.0 A, I_B = 80 mA)		$V_{BE(sat)}$		4.5	V
Base-Emitter On Voltage (I_C = 4.0 A, V_{CE} = 4.0 V)		$V_{BE(on)}$		2.8	V
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 10 V , I_E = 1.0 A, f = 0.1 MHz)		C_{ob}		300	pF
Small-Signal Current Gain (I_C = 3.0 A, V_{CE} = 4.0 V, f = 1.0 KHz)		h_{fe}	300		

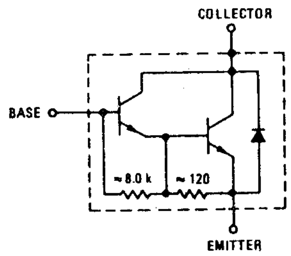
(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≤ 2.0%

INTERNAL SCHEMATIC DIAGRAM

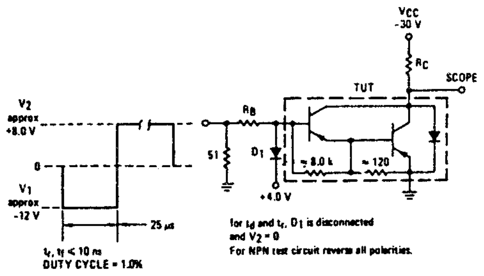
PNP
2N6040
2N6041
2N6042



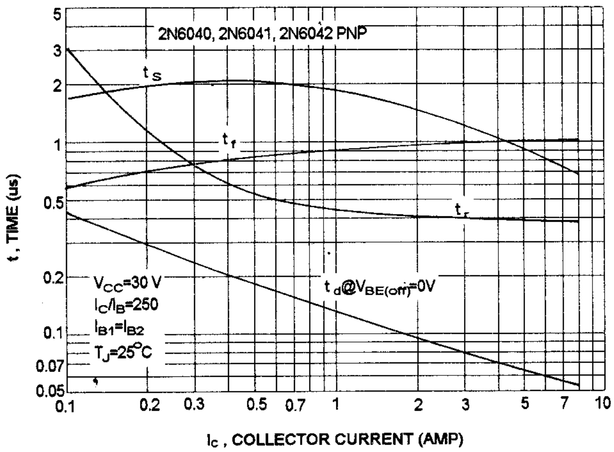
NPN
2N6043
2N6044
2N6045



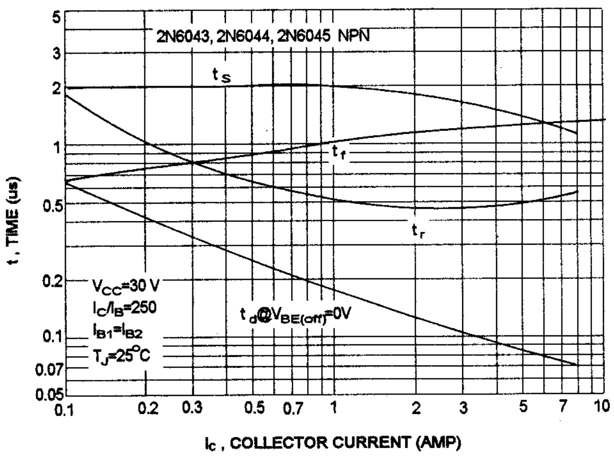
SWITCHING TIMES TEST CIRCUIT



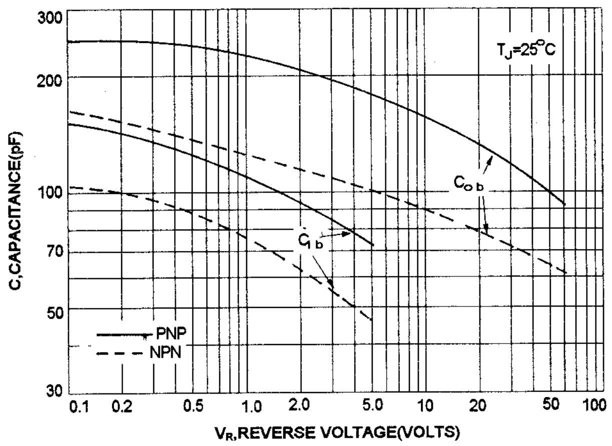
SWITCHING TIMES



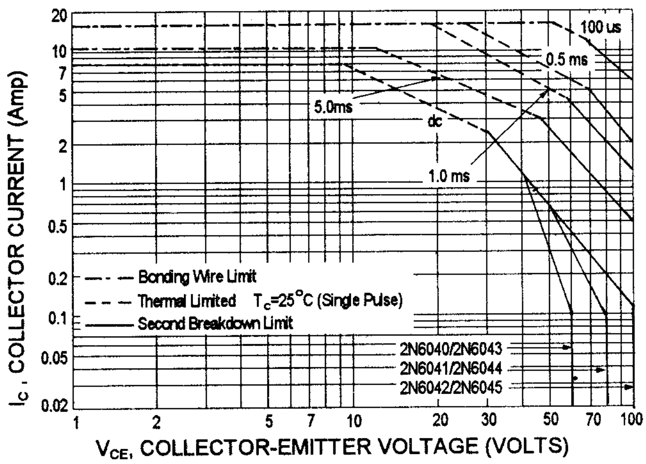
SWITCHING TIMES



CAPACITANCES



ACTIVE-REGION SAFE OPERATING AREA (SOA)

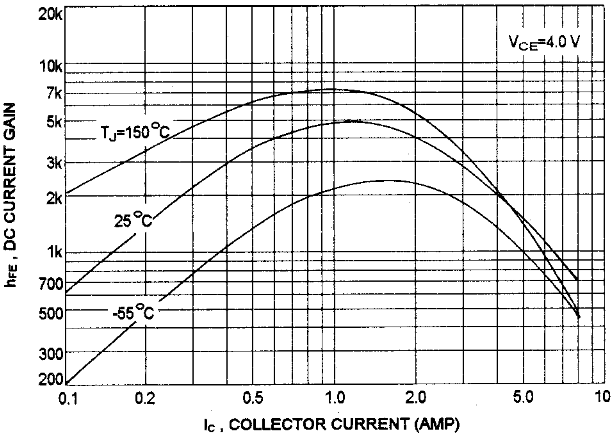


There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

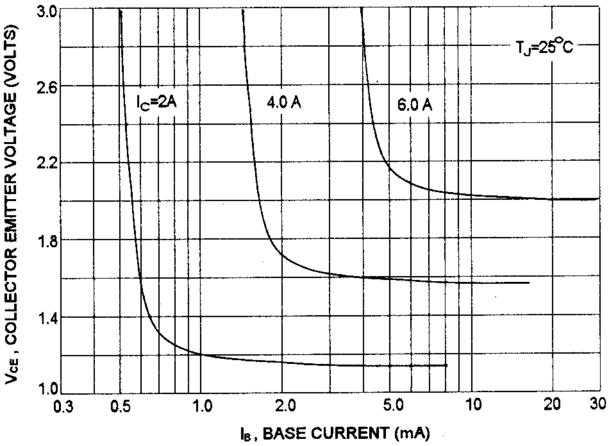
The data of SOA curve is base on $T_{J(PK)}$=150 °C; T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)}$<150°C, At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

PNP 2N6040, 2N6041, 2N6042

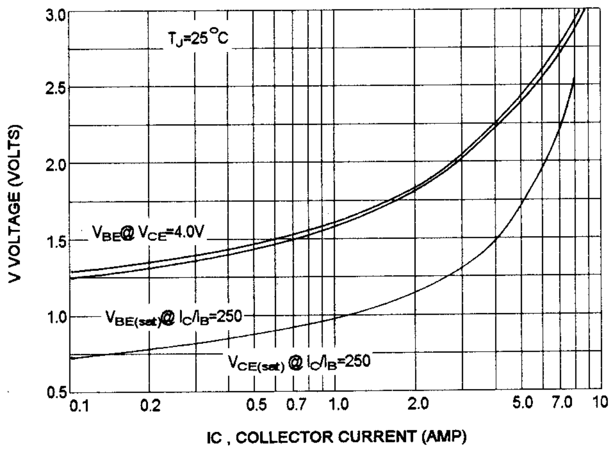
DC CURRENT GAIN



COLLECTOR SATURATION REGION

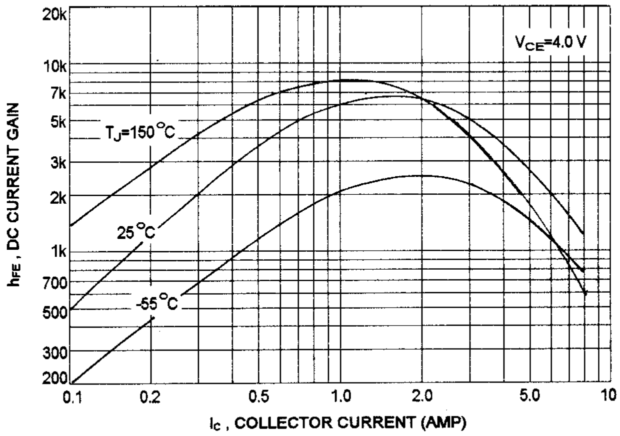


"ON" VOLTAGES

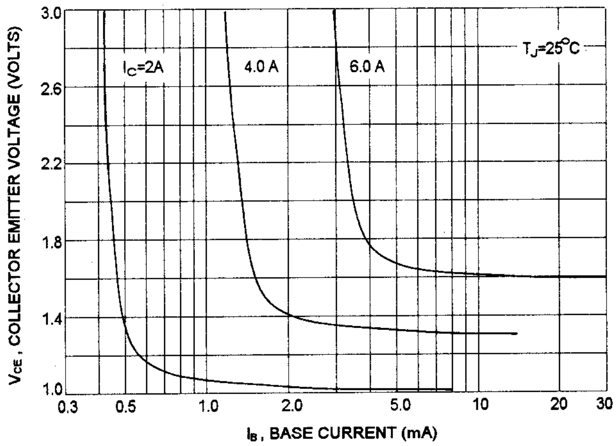


NPN 2N6043, 2N6044, 2N6045

DC CURRENT GAIN



COLLECTOR SATURATION REGION



"ON" VOLTAGES