

## COMPLEMENTARY SILICON PLASTIC POWER TRANSISTORS

... designed for use in general-purpose amplifier and switching applications.

### FEATURES:

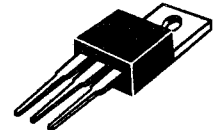
- \* Collector-Emitter Sustaining Voltage-  
 $V_{CE(SUS)}$  = 40 V (Min) -2N6486, 2N6489  
 = 60 V (Min) -2N6487, 2N6490  
 = 80 V (Min) -2N6488, 2N6491
- \* DC Current Gain Specified to 15 Amperes  
 $hFE = 20-150 @ I_C = 5.0 A$   
 $= 5.0(\text{Min}) @ I_C = 15A$

NPN	PNP
2N6486	2N6489
2N6487	2N6490
2N6488	2N6491

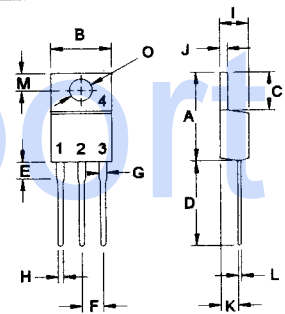
15 AMPERE  
COMPLEMENTARY SILICON  
POWER TRANSISTORS  
40-80 Volts  
75 Watts

### MAXIMUM RATINGS

Characteristic	Symbol	2N6486 2N6489	2N6487 2N6490	2N6488 2N6491	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	60	80	V
Collector-Base Voltage	$V_{CBO}$	50	70	90	V
Emitter-Base Voltage	$V_{EBO}$	5.0			V
Collector Current - Continuous	$I_C$	15			A
Base Current	$I_B$	5.0			A
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	75 0.6			W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150			$^\circ C$



TO-220

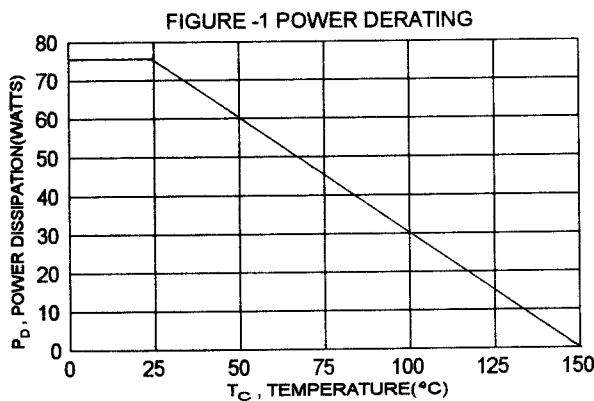


PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

### THERMAL CHARACTERISTICS

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

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



2N6486, 2N6487, 2N6488 NPN / 2N6489, 2N6490, 2N6491 PNP

ELECTRICAL CHARACTERISTICS (  $T_c = 25^\circ\text{C}$  unless otherwise noted )

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector - Emitter Sustaining Voltage (1) ( $I_c = 100 \text{ mA}$ , $I_B = 0$ ) 2N6486, 2N6489 2N6487, 2N6490 2N6488, 2N6491	$V_{CEO(sus)}$	40 60 80		V
Collector Cutoff Current ( $V_{CE} = 20 \text{ V}$ , $I_B = 0$ ) ( $V_{CE} = 30 \text{ V}$ , $I_B = 0$ ) ( $V_{CE} = 40 \text{ V}$ , $I_B = 0$ ) 2N6486, 2N6489 2N6487, 2N6490 2N6488, 2N6491	$I_{CEO}$		1.0 1.0 1.0	mA
Collector Cutoff Current ( $V_{CE} = 45 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 65 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 85 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 40 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ , $T_c = 125^\circ\text{C}$ ) ( $V_{CE} = 60 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ , $T_c = 125^\circ\text{C}$ ) ( $V_{CE} = 80 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ , $T_c = 125^\circ\text{C}$ ) 2N6486, 2N6489 2N6487, 2N6490 2N6488, 2N6491	$I_{CEX}$		0.5 0.5 0.5 5.0 5.0 5.0	mA
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ V}$ , $I_C = 0$ )	$I_{EBO}$		1.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ( $I_c = 5.0 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ ) ( $I_c = 15 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ )	hFE	20 5.0	150	
Collector-Emitter Saturation Voltage ( $I_c = 5.0 \text{ A}$ , $I_B = 0.5 \text{ A}$ ) ( $I_c = 15 \text{ A}$ , $I_B = 5.0 \text{ A}$ )	$V_{CE(sat)}$		1.3 3.5	V
Base-Emitter On Voltage ( $I_c = 5.0 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ ) ( $I_c = 15 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ )	$V_{BE(on)}$		1.3 3.5	V

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product (2) ( $I_c = 1.0 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ , $f = 1.0 \text{ MHz}$ )	$f_T$	5.0		MHz
Small-Signal Current Gain ( $I_c = 1.0 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ , $f = 1.0 \text{ KHz}$ )	$h_{fe}$	15		

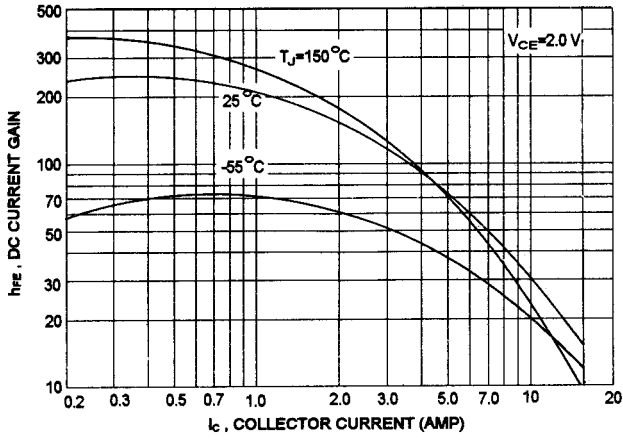
(1) Pulse Test: Pulse width =  $300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

(2)  $f_T = |h_{re}| \cdot f_{test}$

2N6486, 2N6487, 2N6488 NPN / 2N6489, 2N6490, 2N6491 PNP

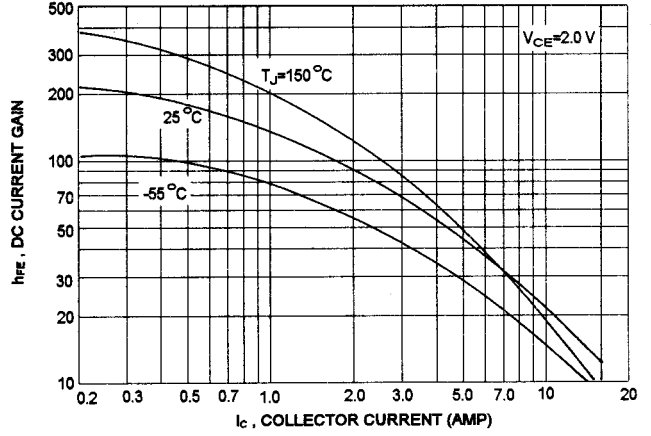
NPN 2N6486, 2N6487, 2N6488

DC CURRENT GAIN

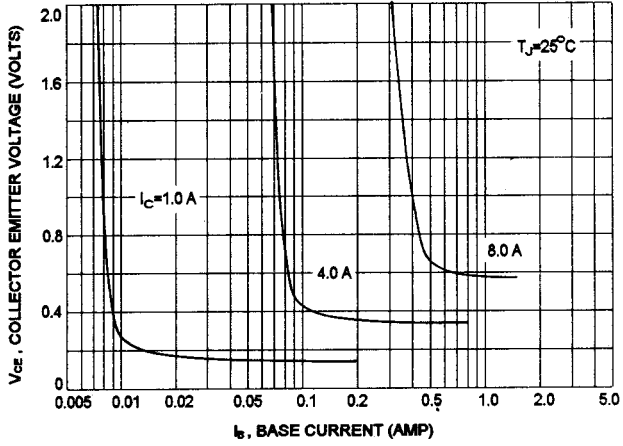


PNP 2N6489, 2N6490, 2N6491

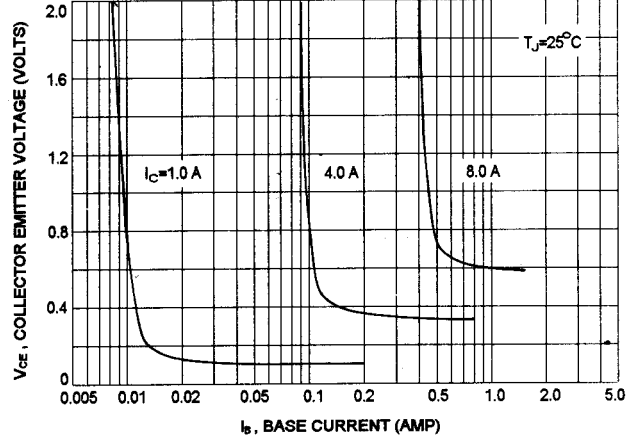
DC CURRENT GAIN



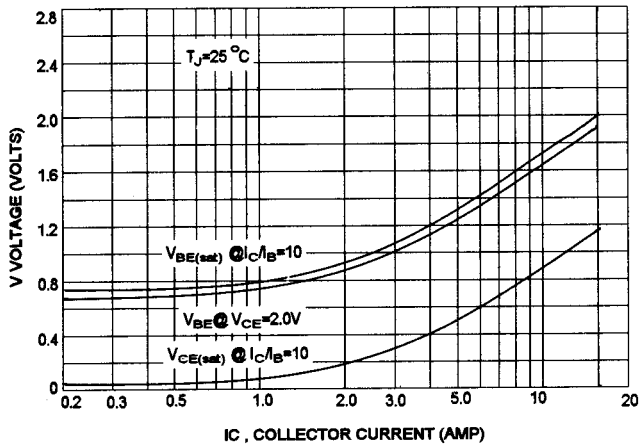
COLLECTOR SATURATION REGION



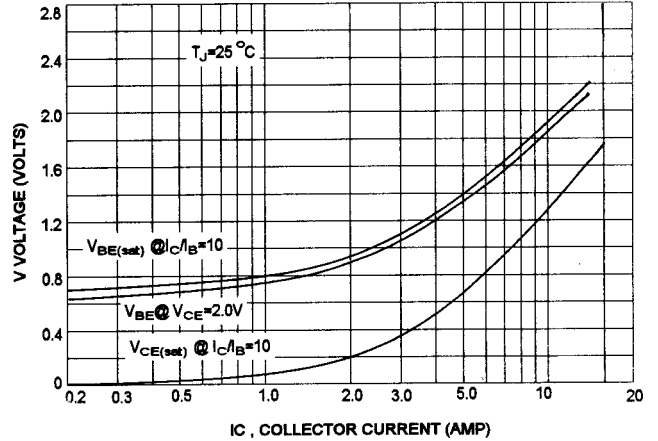
COLLECTOR SATURATION REGION



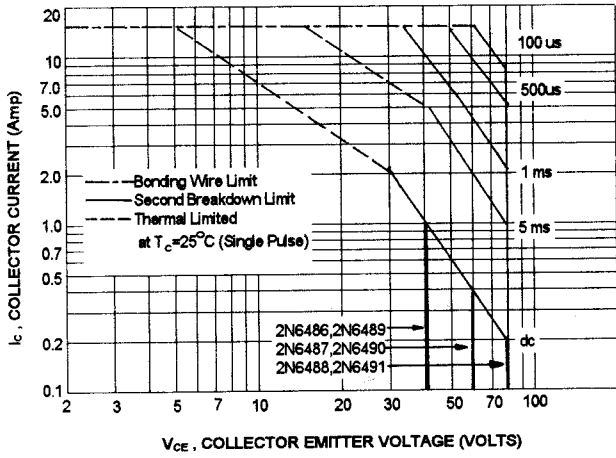
"ON" VOLTAGES



"ON" VOLTAGES



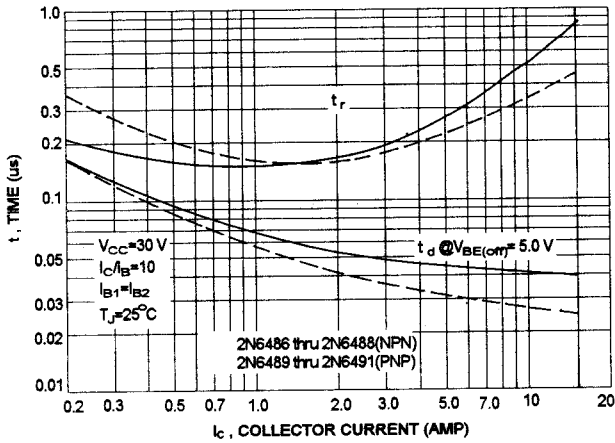
ACTIVE-REGION SAFE OPERATING AREA (SOA)



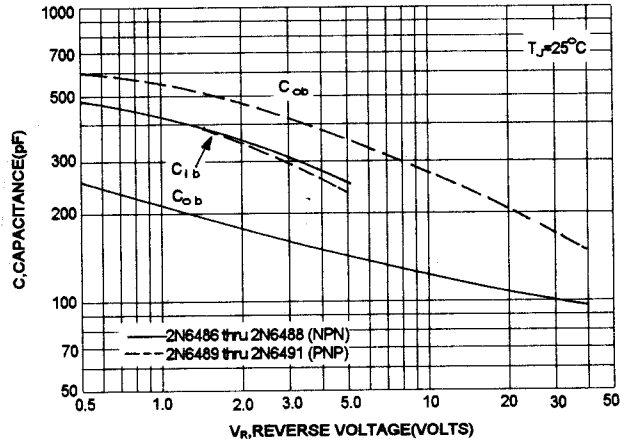
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater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

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

TURN-ON TIME



CAPACITANCES



TURN-OFF TIME

