

## COMPLEMENTARY MEDIUM-POWER HIGH VOLTAGE POWER TRANSISTORS

... designed for high-speed switching and linear amplifier application for high-voltage operational amplifiers, switching regulators, convertors, deflection stages and high fidelity amplifiers.

### FEATURES:

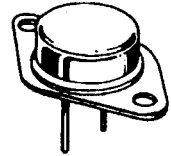
- \* Continuous Collector Current -  $I_C = 2 \text{ A}$
- \* Power Dissipation -  $P_D = 35 \text{ W}$  @  $T_C = 25^\circ\text{C}$
- \*  $V_{CE(SAT)} = 0.75 \text{ V (Max.)}$  @  $I_C = 1.0 \text{ A}$ ,  $I_B = 125 \text{ mA}$

NPN	PNP
2N3583	2N6420
2N3584	2N6421
2N3585	2N6422
2N4240	2N6423

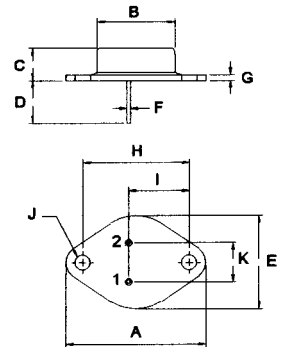
1.0 AND 2.0 AMPERE  
POWER TRANSISTOR  
COMPLEMENTARY SILICON  
175-300 VOLTS  
35 WATTS

### MAXIMUM RATINGS

Characteristic	Symbol	2N3583 2N6420	2N3584 2N6421	2N3585 2N6422	2N4240 2N6423	Unit
Collector-Emitter Voltage	$V_{CEO}$	175	250	300	300	V
Collector-Base Voltage	$V_{CBO}$	250	375	500	500	V
Emitter-Base Voltage	$V_{EBO}$	6				V
Collector Current-Continuous Peak	$I_C$	1.0 5.0	2.0 5.0			A
Base Current	$I_B$	1.0				A
Total Power Dissipation @ $T_C=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	35 0.2				W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +200				$^\circ\text{C}$



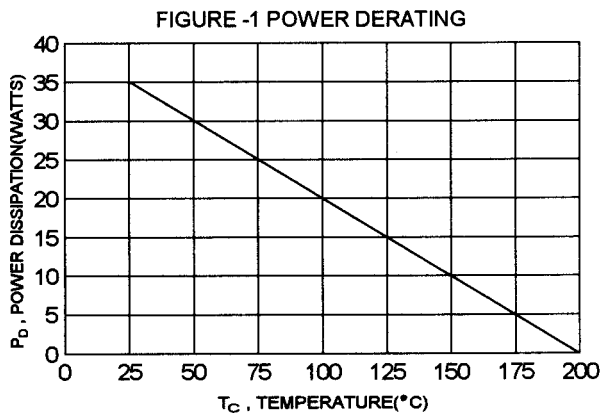
TO-66



PIN 1.BASE  
2.EMITTER  
COLLECTOR (CASE)

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	5.0	$^\circ\text{C/W}$



DIM	MILLIMETERS	
	MIN	MAX
A	30.60	32.52
B	13.85	14.16
C	6.54	7.22
D	9.50	10.50
E	17.26	18.46
F	0.76	0.92
G	1.38	1.65
H	24.16	24.78
I	13.84	15.60
J	3.32	3.92
K	4.86	5.34

**2N3583 thru 2N3585,2N4240 NPN / 2N6420 thru 2N6423 PNP**

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector - Emitter Sustaining Voltage (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ ) NPN 2N3583,2N6420 2N3584,2N6421 ( $I_C = 50\text{ mA}$ , $I_B = 0$ ) PNP 2N3585,2N6422 2N4240,2N6423	$V_{CE(sus)}$	175 250 300 300		V
Collector Cutoff Current ( $V_{CE} = 150\text{ V}$ , $I_B = 0$ ) 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422 2N4240,2N6423	$I_{CEO}$		10 5.0 5.0 5.0	mA
Collector Cutoff Current ( $V_{CE} = 225\text{ V}$ , $V_{BE(on)} = 1.5\text{ V}$ ) ( $V_{CE} = 340\text{ V}$ , $V_{BE(on)} = 1.5\text{ V}$ ) ( $V_{CE} = 450\text{ V}$ , $V_{BE(on)} = 1.5\text{ V}$ ) 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422 2N4240,2N6423 ( $V_{CE} = 225\text{ V}$ , $V_{BE(on)} = 1.5\text{ V}$ , $T_C = 150^\circ\text{C}$ ) ( $V_{CE} = 300\text{ V}$ , $V_{BE(on)} = 1.5\text{ V}$ , $T_C = 150^\circ\text{C}$ ) 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422 2N4240,2N6423	$I_{CEX}$		1.0 1.0 1.0 2.0 3.0 3.0 3.0 5.0	mA
Emitter Cutoff Current ( $V_{EB} = 6.0\text{ V}$ , $I_C = 0$ ) 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422 2N4240,2N6423	$I_{EBO}$		5.0 0.5 0.5 0.5	mA

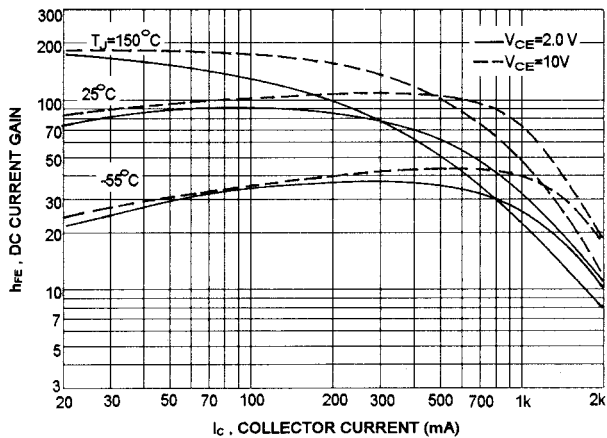
**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 0.1\text{ A}$ , $V_{CE} = 10\text{ V}$ ) ( $I_C = 0.5\text{ A}$ , $V_{CE} = 10\text{ V}$ ) ( $I_C = 0.75\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) ( $I_C = 0.75\text{ A}$ , $V_{CE} = 10\text{ V}$ ) ( $I_C = 1.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422 2N4240,2N6423 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422	hFE	40 40 10 30 8.0 8.0 10 25 25	200 100 150 80 80 100 100	
Collector - Emitter Saturation Voltage ( $I_C = 0.75\text{ A}$ , $I_B = 75\text{ mA}$ ) ( $I_C = 1.0\text{ A}$ , $I_B = 125\text{ mA}$ ) 2N4240,2N6423 2N3583,2N6420 2N3584,2N6421 2N3585,2N6422	$V_{CE(sat)}$		1.0 5.0 0.75 0.75	V
Base - Emitter Saturation Voltage ( $I_C = 0.75\text{ A}$ , $I_B = 75\text{ mA}$ ) ( $I_C = 1.0\text{ A}$ , $I_B = 100\text{ mA}$ ) 2N4240,2N6423 2N3584,2N6421 2N3585,2N6422	$V_{BE(sat)}$		1.8 1.4 1.4	V
Base - Emitter On Voltage ( $I_C = 1.0\text{ A}$ , $V_{CE} = 10\text{ V}$ ) All devices	$V_{BE(on)}$		1.4	V

(1) Pulse Test: Pulse width = 300 us , Duty Cycle  $\leq 2.0\%$

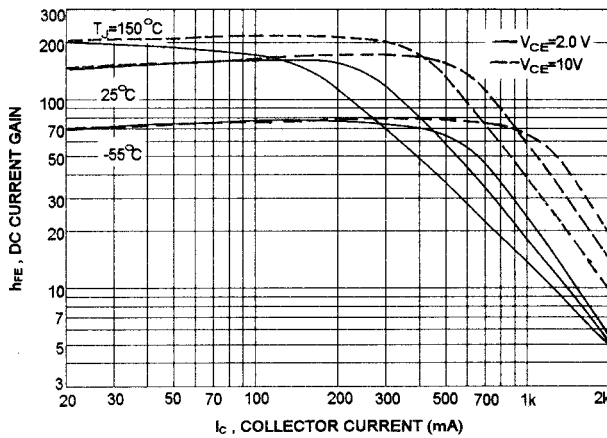
2N3583 thru 2N3585,2N4240

DC CURRENT GAIN

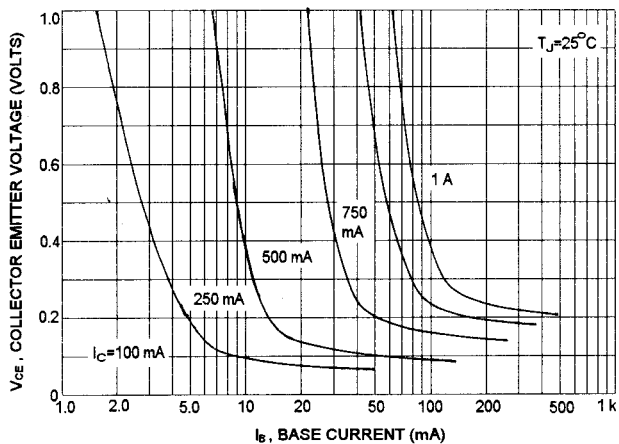


2N6420 thru 2N6423

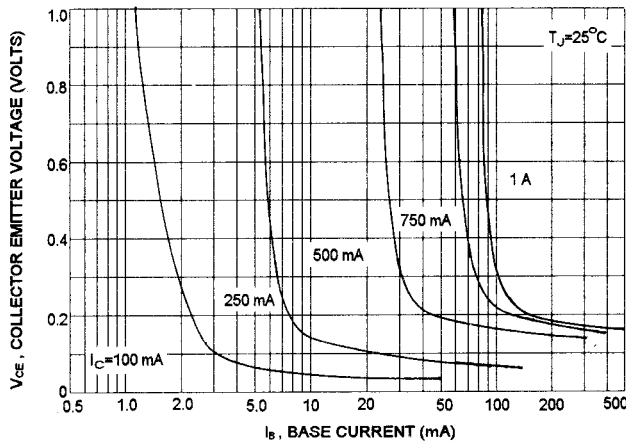
DC CURRENT GAIN



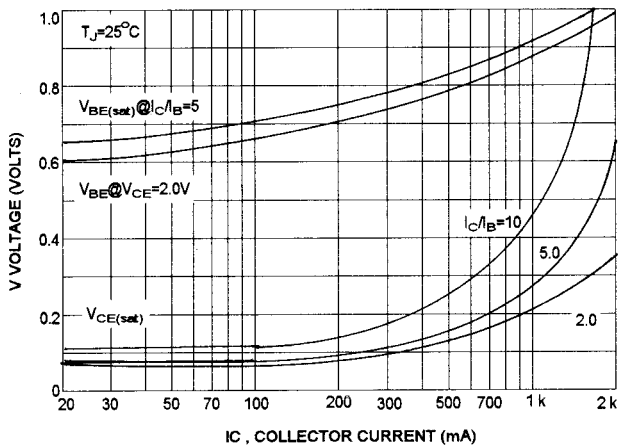
COLLECTOR SATURATION REGION



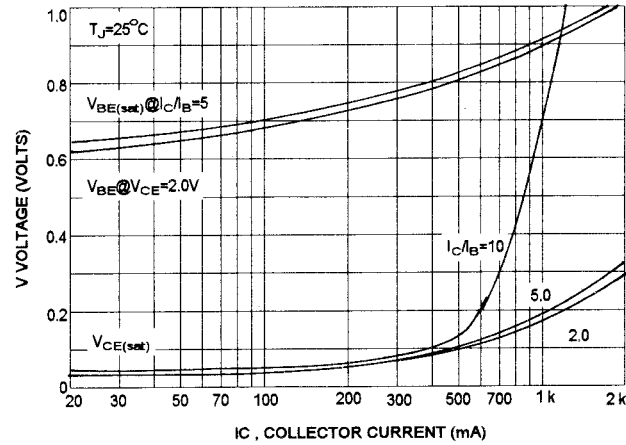
COLLECTOR SATURATION REGION



"ON" VOLTAGES



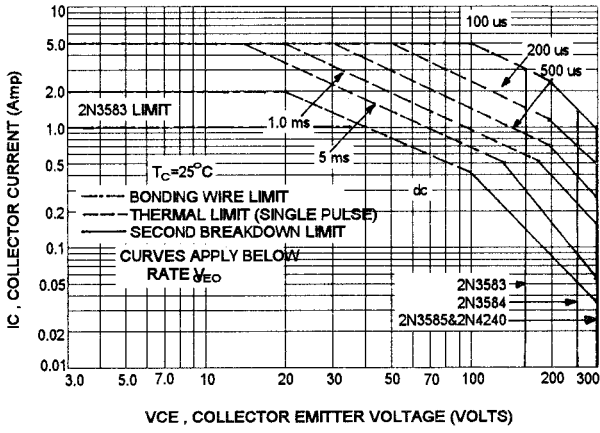
"ON" VOLTAGES



2N3583 thru 2N3585, 2N4240 NPN / 2N6420 thru 2N6423 PNP

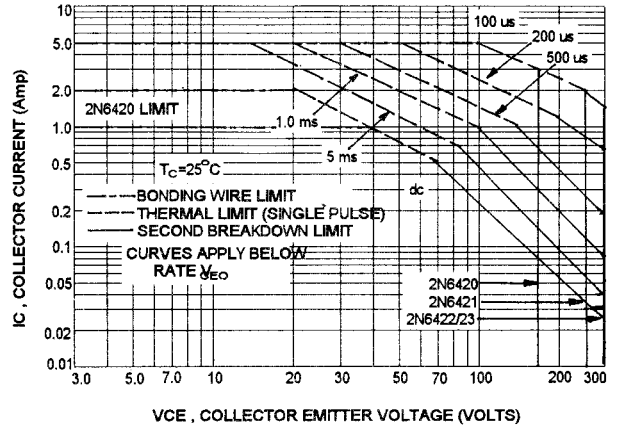
2N3583 thru 2N3585, 2N4240

ACTIVE REGION SAFE OPERATING AREA

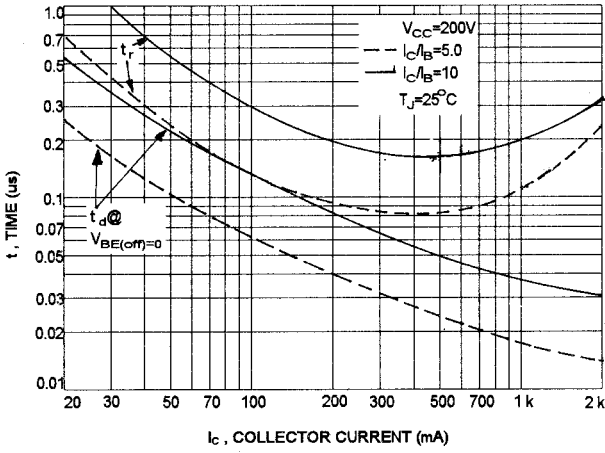


2N6420 thru 2N6423

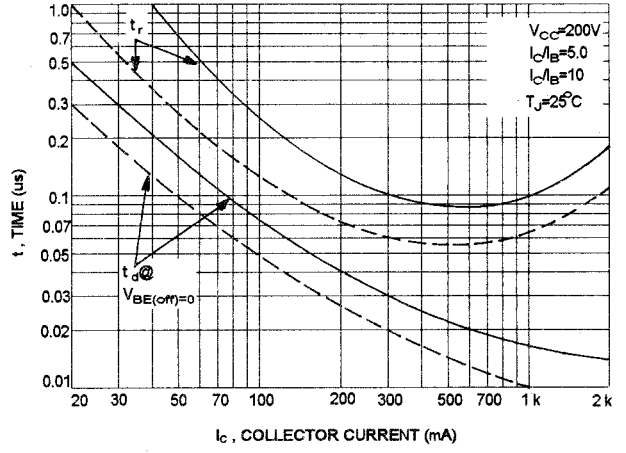
ACTIVE REGION SAFE OPERATING AREA



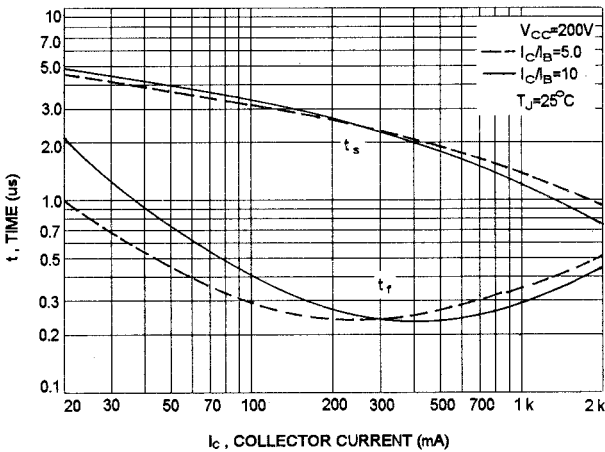
TURN-ON TIME



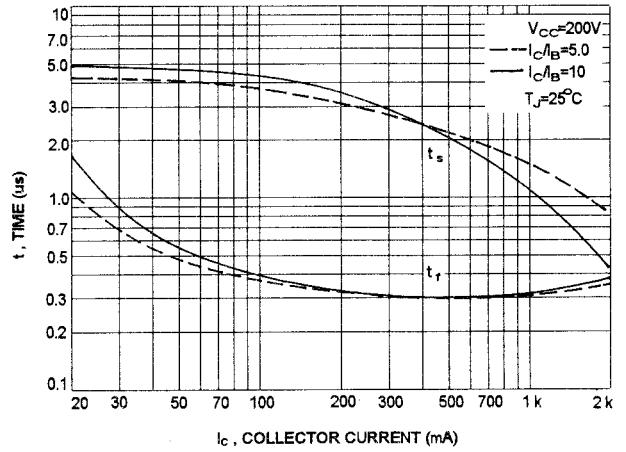
TURN-ON TIME



TURN-OFF TIME



TURN-OFF TIME



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