

COMPLEMENTARY SILICON HIGH-POWER TRANSISTORS

.. Power Base complementary transistors designed for high power audio, stepping motor and other linear application. These devices can also be used in power switching circuits such as relay or solenoid drivers, inverter dc-to-dc converters, or for inductive loads requiring higher safe operating area than the 2N3055 and MJ2955.

* Current-Gain - Bandwidth-Product@ $I_C=1.0A$

$f_T = 0.8 \text{ MHz (Min)- NPN}$

$= 2.2 \text{ MHz (Min)- PNP}$

* Safe Operating Area-Rated to 60 V and 120 V, Respectively

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NPN	PNP
2N3055A	MJ2955A
MJ15015	MJ15016

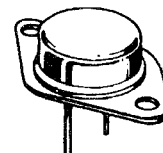
**15 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS**
60 , 120 VOLTS
115 , 180 WATTS

MAXIMUM RATINGS

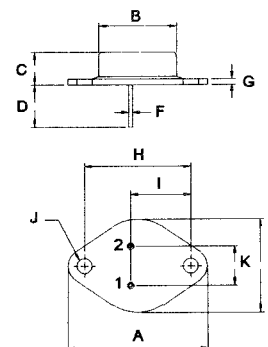
Characteristic	Symbol	2N3055A MJ2955A	MJ15015 MJ15016	Unit
Collector-Emitter Voltage	V_{CEO}	60	120	V
Collector-Base Voltage	V_{CBO}	100	200	V
Collector-Emitter Voltage Base Reversed Biased	V_{CEV}	100	200	V
Emitter-Base Voltage	V_{EBO}	7.0		V
Collector Current-Continuous	I_C	15		A
Base Current	I_B	7.0		A
Total Power Dissipation @ $T_C=25^\circ C$ Derate above $25^\circ C$	P_D	115 0.65	180 1.03	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +200		$^\circ C$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max		Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.52	0.98	$^\circ C/W$



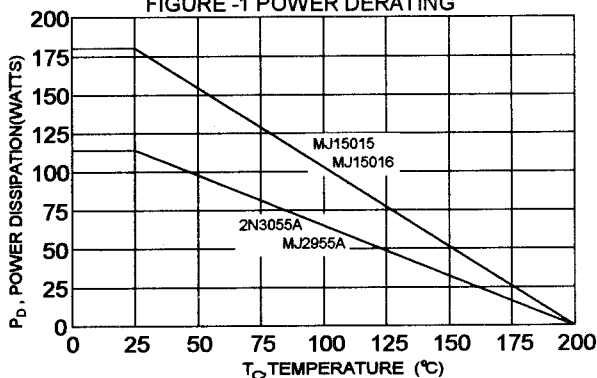
TO-3



PIN 1.BASE
2.EMITTER
COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.43	11.18

FIGURE -1 POWER DERATING



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2N3055A, MJ15015 NPN / MJ2955A, MJ15016 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) ($I_C = 200\text{ mA}$, $I_B = 0$) 2N3055A, MJ2955A MJ15015, MJ15016	$V_{CEO(SUS)}$	60 120		V
Collector Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 60\text{ V}$, $I_B = 0$) 2N3055A, MJ2955A MJ15015, MJ15016	I_{CEO}		0.7 0.1	mA
Collector Cutoff Current ($V_{BE(off)} = 1.5\text{ V}$) ($V_{CEV} = \text{Rated Value}$) 2N3055A, MJ2955A MJ15015, MJ15016	I_{CEV}		5.0 1.0	mA
Collector Cutoff Current ($V_{BE(off)} = 1.5\text{ V}$, $T_c = 150^\circ\text{C}$) ($V_{CEV} = \text{Rated Value}$) 2N3055A, MJ2955A MJ15015, MJ15016	I_{CEV}		30 6.0	mA
Emitter Cutoff Current ($V_{EB} = 7.0\text{ V}$, $I_C = 0$) 2N3055A, MJ2955A MJ15015, MJ15016	I_{EBO}		5.0 0.2	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 4.0\text{ A}$, $V_{CE} = 2.0\text{ V}$) ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 10\text{ A}$, $V_{CE} = 4.0\text{ V}$)	h_{FE}	10 20 5.0	70 70	
Collector - Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 3.3\text{ A}$) ($I_C = 15\text{ A}$, $I_B = 7.0\text{ A}$)	$V_{CE(sat)}$		1.1 3.0 5.0	V
Base - Emitter On Voltage ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	$V_{BE(on)}$	0.7	1.8	V

DYNAMIC CHARACTERISTICS

Current Gain - Bandwidth Product ($I_C = 1.0\text{ A}$, $V_{CE} = 4.0\text{ V}$, $f = 1.0\text{ MHz}$) 2N3055A, MJ15015 MJ2955A, MJ15016	f_T	0.8 2.2	6.0 18	MHz
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(1) Pulse Test: Pulse width = 300 μs , Duty Cycle $\leq 2.0\%$

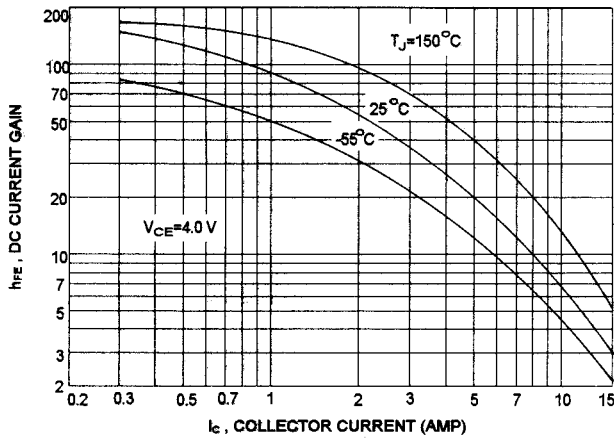
(2) $f_T = |h_{fe}| \cdot f_{test}$

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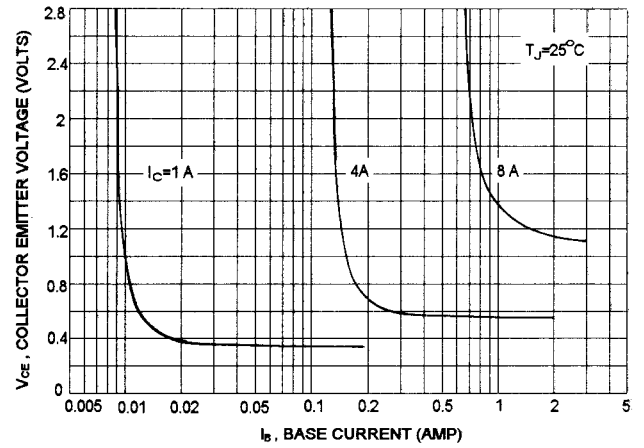
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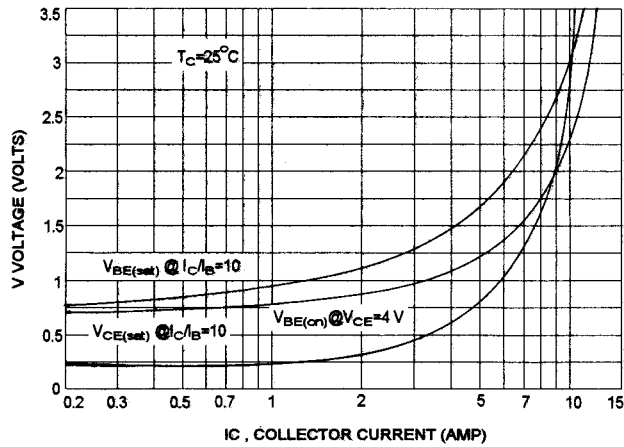
DC CURRENT GAIN



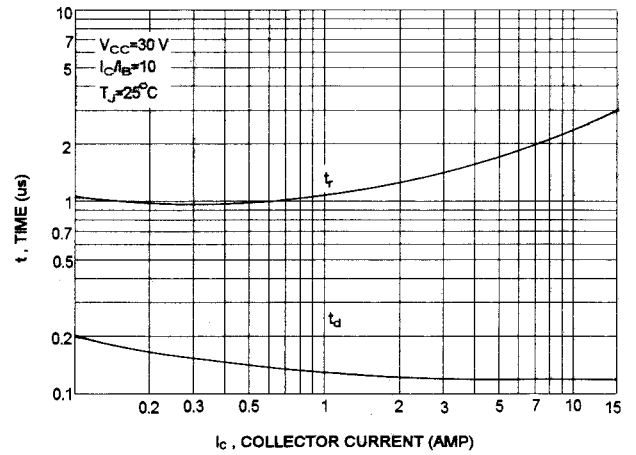
COLLECTOR SATURATION REGION



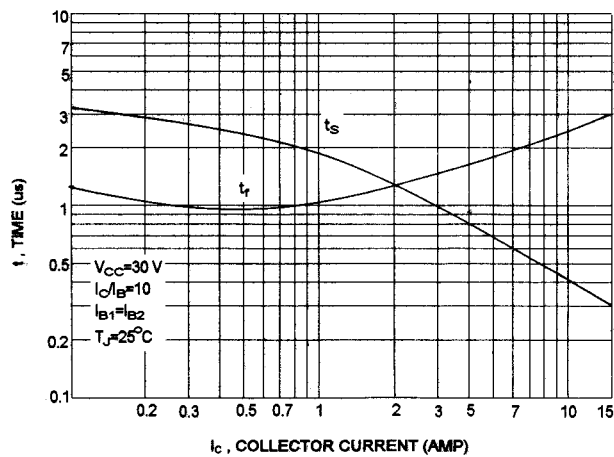
"ON" VOLTAGES



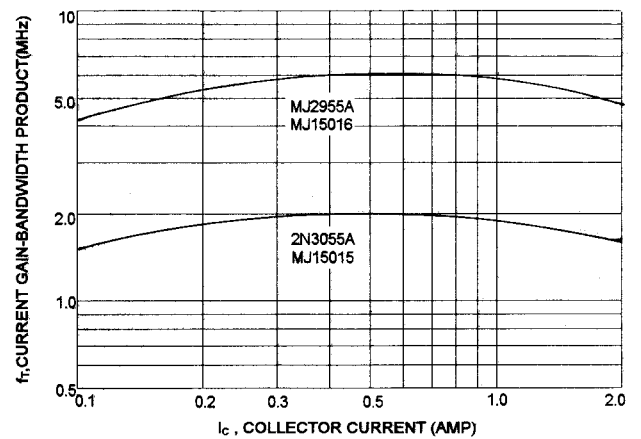
TURN-ON TIME



TURN-OFF TIME



CURRENT GAIN-BANDWIDTH PRODUCT



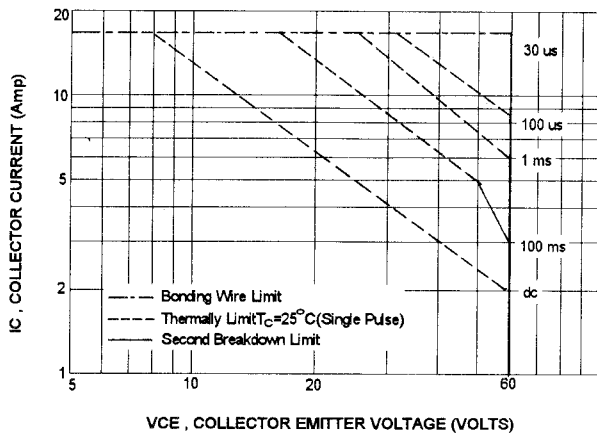
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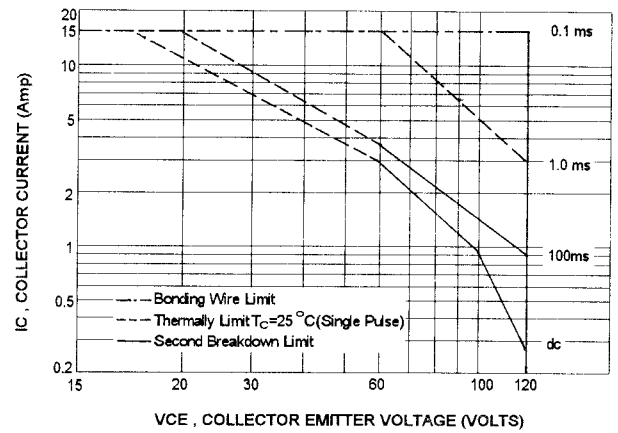
2N3055A, MJ2955A

ACTIVE REGION SAFE OPERATING AREA

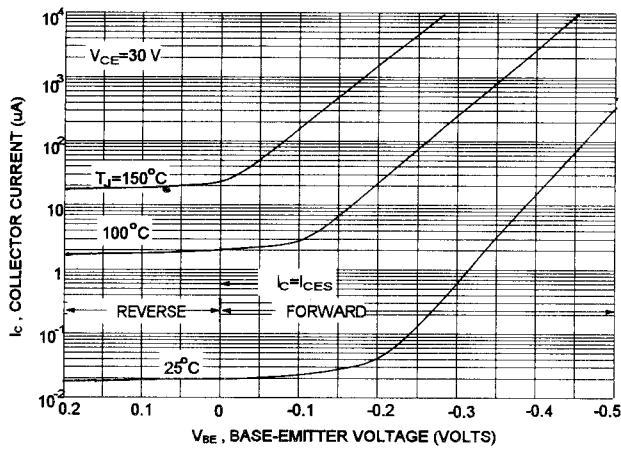


MJ15015, MJ15016

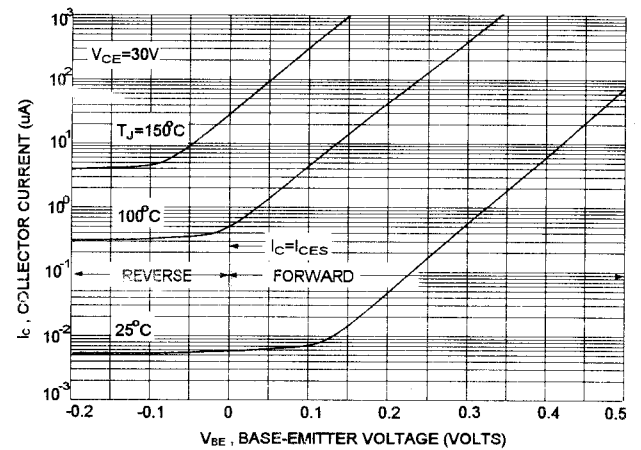
ACTIVE REGION SAFE OPERATING AREA



COLLECTOR CUT-OFF REGION



COLLECTOR CUT-OFF REGION



CAPACITANCES

