

SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching in inductive circuit, motor control, solenoid and relay drivers.

FEATURES:

*Collector-Emitter Sustaining Voltage-

$$V_{CE(sus)} = 375 \text{ V (Min) - TIPL755}$$

$$= 420 \text{ V (Min) - TIPL755A}$$

* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 2.5 \text{ V (Max.) @ } I_C = 10.0 \text{ A, } I_B = 2.0 \text{ A}$$

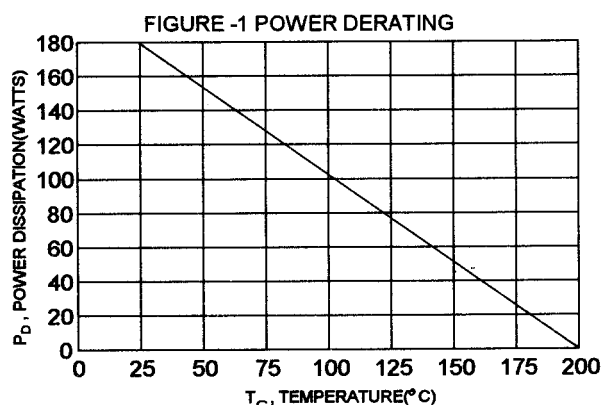
* Switching Time - $t_f = 0.7 \text{ us (Max.) @ } I_C = 10 \text{ A}$

MAXIMUM RATINGS

Characteristic	Symbol	TIPL755	TIPL755A	Unit
Collector-Emitter Voltage	V_{CEO}	375	420	V
Collector-Base Voltage	V_{CBO}	800	1000	V
Collector-Base Voltage	V_{EBO}	10		V
Collector current - Continuous	I_C	10		A
- Peak	I_{CM}	15		
Base current - Continuous	I_B	5.0		A
Emitter current - Continuous	I_E	15		A
- Peak	I_{EM}	30		
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	180	1.03	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +200		$^\circ\text{C}$

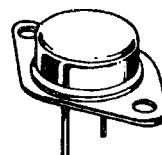
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	0.97	$^\circ\text{C/W}$

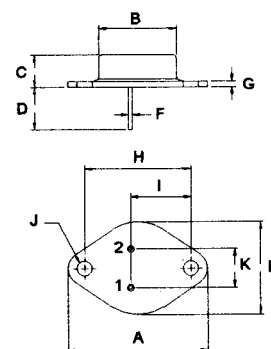


NPN
TIPL755
TIPL755A

10 AMPERE
NPN SILICON
POWER TRANSISTORS
375 - 420 VOLTS
180 WATTS



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	10.67	11.18

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) ($I_C = 100\text{ mA}$, $L=25\text{ mH}$)	TIPL755 TIPL755A	$V_{CE(sus)}$	375 420	V
Collector Cutoff Current ($V_{CE} = 375\text{ V}$, $V_{BE} = 0$) ($V_{CE} = 420\text{ V}$, $V_{BE} = 0$)	TIPL755 TIPL755A	I_{CEO}	50 50	μA
Collector Cutoff Current ($V_{CE} = 800\text{ V}$, $V_{BE} = 0$) ($V_{CE} = 1000\text{ V}$, $V_{BE} = 0$) ($V_{CE} = 800\text{ V}$, $V_{BE} = 0$, $T_c = 100^\circ\text{C}$) ($V_{CE} = 1000\text{ V}$, $V_{BE} = 0$, $T_c = 100^\circ\text{C}$)	TIPL755 TIPL755A TIPL755 TIPL755A	I_{CES}	50 50 500 500	μA
Emitter Cutoff Current ($V_{EB} = 10\text{ V}$, $I_C = 0$)		I_{EBO}	1.0	mA

ON CHARACTERISTICS(1)

DC Current Gain ($I_C = 0.5\text{ A}$, $V_{CE} = 5.0\text{ V}$)	h_{FE}	15	60	
Collector-Emitter Saturation Voltage ($I_C = 2.0\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 5.0\text{ A}$, $I_B = 1.0\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 2.0\text{ A}$)	$V_{CE(sat)}$		0.5 1.0 2.5	V
Base-Emitter Saturation Voltage ($I_C = 2.0\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 5.0\text{ A}$, $I_B = 1.0\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 2.0\text{ A}$)	$V_{BE(sat)}$		1.1 1.3 1.8	V

DYNAMIC CHARACTERISTICS

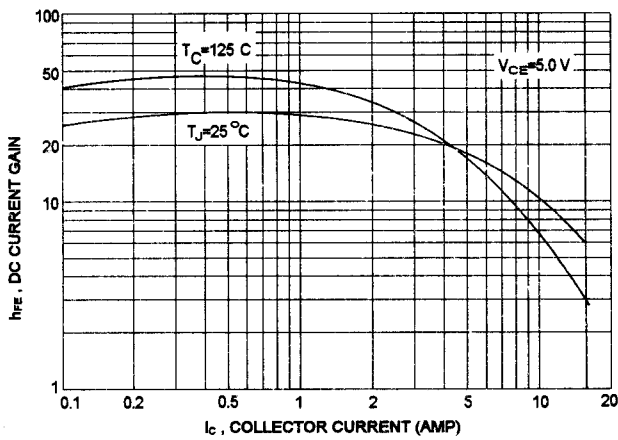
Current Gain - Bandwidth Product (2) ($I_C = 500\text{ mA}$, $V_{CE} = 10\text{ V}$, $f_{TEST} = 1.0\text{ MHz}$)	f_T	5.0		MHz
Output Capacitance ($V_{CB} = 20\text{ V}$, $I_E = 0$, $f = 0.1\text{ MHz}$)	C_{ob}	150(typ)		pF

SWITCHING CHARACTERISTICS

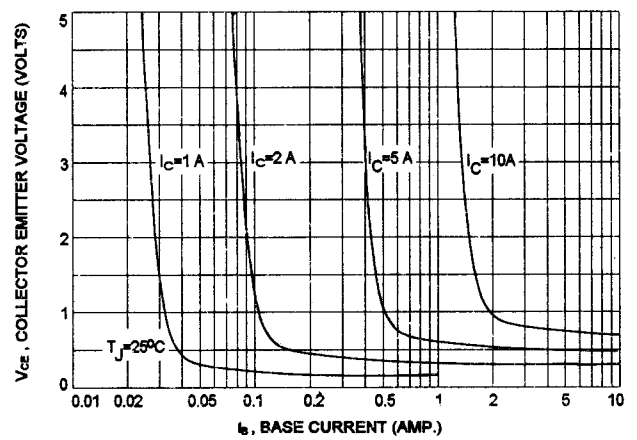
On Time	$I_C=10\text{ A}$, $V_{CC}=250\text{ V}$ $I_{B1}=2.0\text{ A}$, $I_{B2}=2.5\text{ A}$ $t_p=100\text{ us}$ Duty Cycle $\leq 2.0\%$	t_{on}	0.75	μs
Storage Time		t_s	2.0	μs
Fall Time		t_f	0.7	μs

(1) Pulse Test: Pulse width $\leq 300\text{ us}$, Duty Cycle $\leq 2.0\%$ (2) $f_T = |h_{fe}| \cdot f_{TEST}$

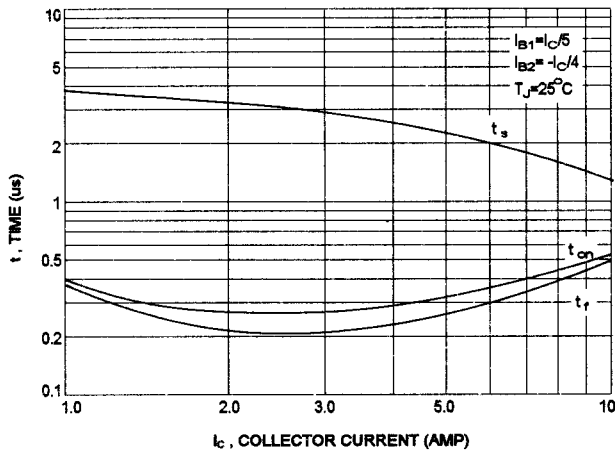
DC CURRENT GAIN



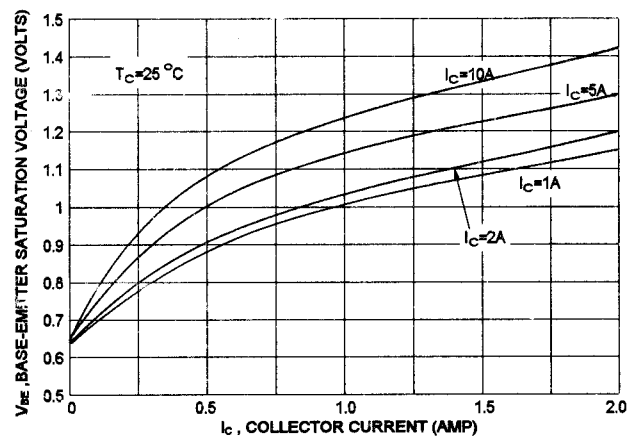
COLLECTOR SATURATION REGION



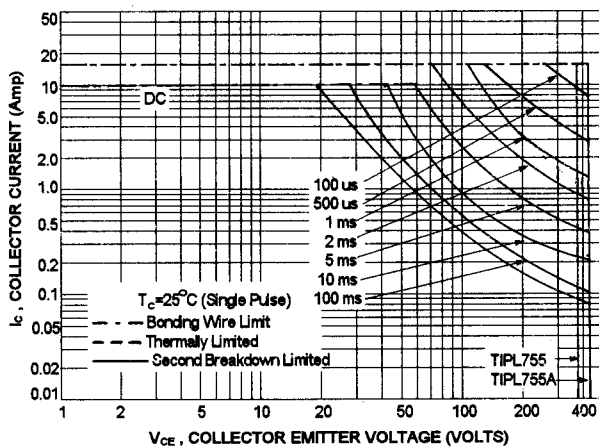
TURN-OFF TIME



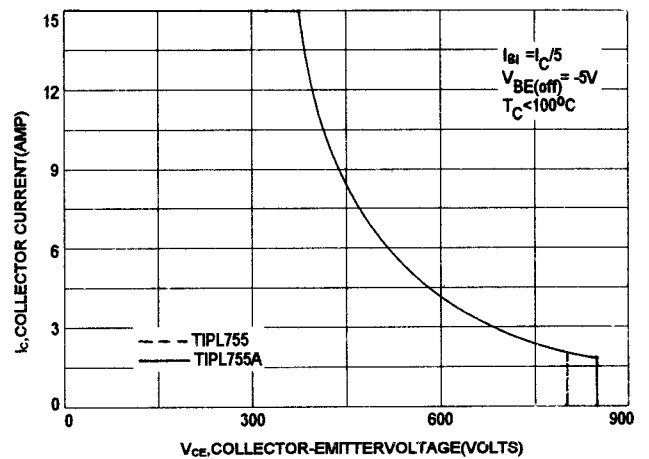
BASE - EMITTER SATURATION VOLTAGE



ACTIVE REGION SAFE OPERATING AREA



REVERSE-BIAS SAFE OPERATING AREA



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