

# MOSPEC

## 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 -

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

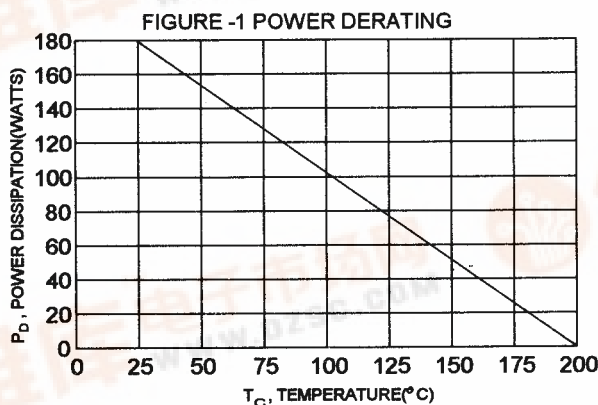
\* Switching Time -  $t_f = 0.7 \text{ us (Max.) @ } I_C = 10 \text{ A}$

### 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 @ $T_C = 25^\circ\text{C}$	$P_D$	180		W
Derate above $25^\circ\text{C}$		1.03		W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	- 65 to +200		$^\circ\text{C}$

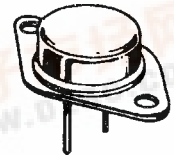
### THERMAL CHARACTERISTICS

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

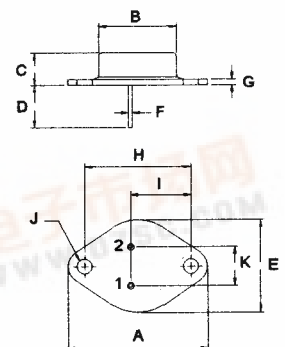


**NPN**  
**TIPL755**  
**TIPL755A**

**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
----------------	--------	-----	-----	------

**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	$\mu\text{A}$
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	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 10 \text{ V}$ , $I_c = 0$ )		$I_{EBO}$	1.0	mA

**ON CHARACTERISTICS(1)**

DC Current Gain ( $I_c = 0.5 \text{ A}$ , $V_{CE} = 5.0 \text{ V}$ )		hFE	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**

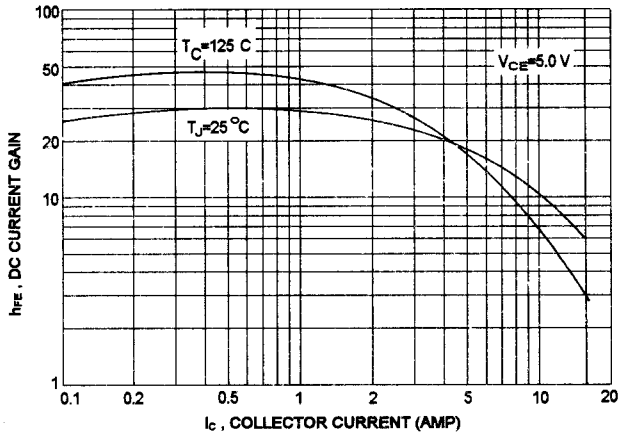
On Time	$I_c=10 \text{ A}$ , $V_{CC}=250 \text{ V}$ $I_{B1}=2.0 \text{ A}$ , $I_{B2}=2.5 \text{ A}$ $t_p=100 \mu\text{s}$ Duty Cycle $\leq 2.0\%$	$t_{on}$	0.75	$\mu\text{s}$
Storage Time		$t_s$	2.0	$\mu\text{s}$
Fall Time		$t_f$	0.7	$\mu\text{s}$

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

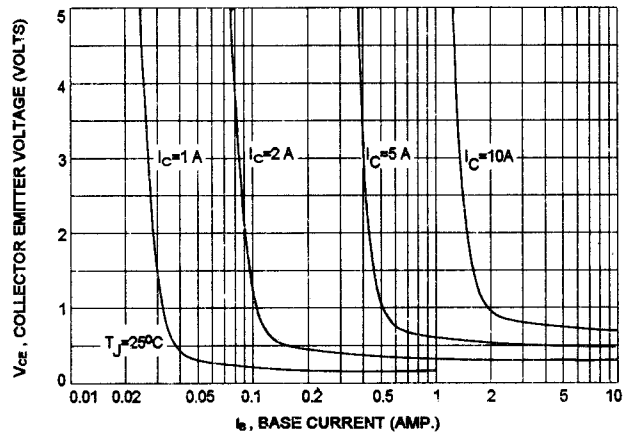
(2)  $f_T = |h_{fe}| \cdot f_{TEST}$



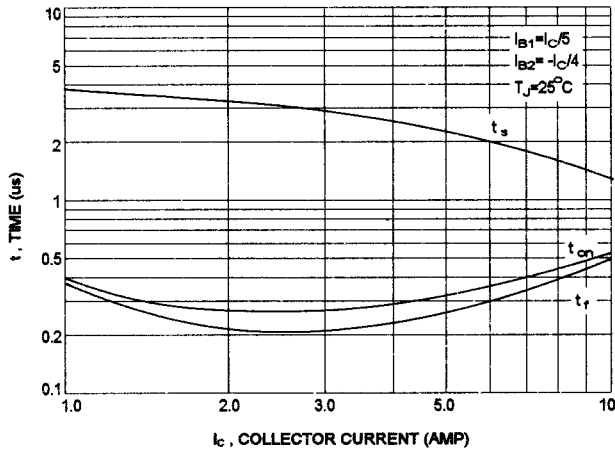
DC CURRENT GAIN



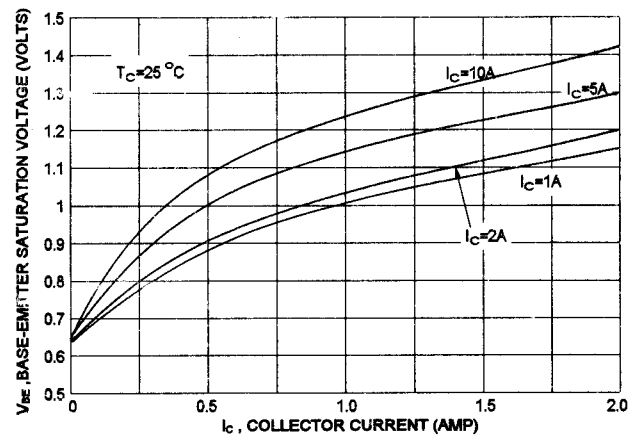
COLLECTOR SATURATION REGION



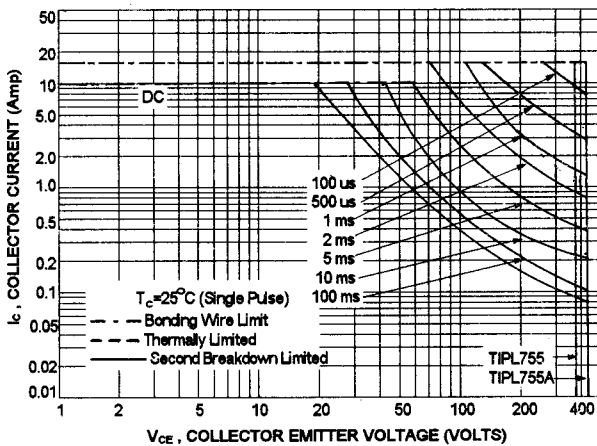
TURN-OFF TIME



BASE - EMITTER SATURATION VOLTAGE



ACTIVE REGION SAFE OPERATING AREA



REVERSE-BIAS SAFE OPERATING AREA

