

8961726 TEXAS INSTR (OPT0)

62C 37099 D

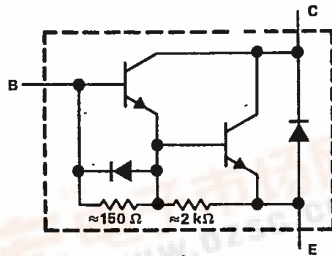
TIPL775, TIPL775A
N-P-N MONOLITHIC DARLINGTON-CONNECTED
SILICON POWER TRANSISTORS

OCTOBER 1982 - REVISED OCTOBER 1984

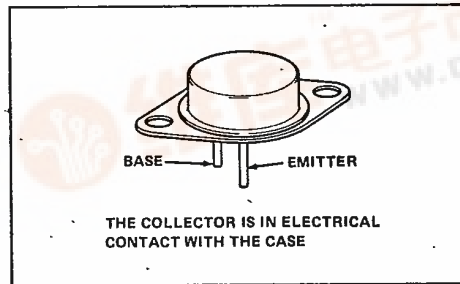
T-33-29

- Specifically Designed For Low-Loss, High-Current, High-Speed Switching Applications
- t_{x0} Typically 320 ns at $I_C = 10$ A
- Operating Characteristics Fully Guaranteed at 100°C
- $I_{CES} < 1$ mA at Maximum Rated V_{CE} at 100°C
- $V_{CEO(sus)}$: TIPL775 ... 120 V Min
 TIPL775A ... 150 V Min

device schematic



TO-3 PACKAGE



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	TIPL775	TIPL775A
Collector-base voltage	160 V	210 V
Collector-emitter voltage ($V_{BE} = 0$)	150 V	200 V
Collector-emitter voltage ($I_B = 0$)	120 V	160 V
Base-emitter voltage	8 V	
Continuous collector current	10 A	
Peak collector current (see Note 1)	15 A	
Peak parallel diode forward current (see Note 1)	10 A	
Continuous device dissipation at 25°C case temperature	100 W	
Operating collector junction and storage temperature range	-65°C to 200°C	

NOTE 1: This value applies for $t_W = 2$ ms, duty cycle $\leq 2\%$

TIPL Devices

6



8961726 TEXAS INSTR (OPTO)

62C 37100 D

T-33-29

TIPL775, TIPL775A
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SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	TIPL775			TIPL775A			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V(BR)CBO	I _C = 1 mA, I _E = 0, See Note 3	160			210			V
V _{CEO(sus)}	I _C = 100 mA, L = 25 mH, See Note 2	120			160			V
I _{CEV}	V _{CE} = 150 V, V _{BE} = 1.5 V to 8 V			50				μA
	V _{CE} = 200 V, V _{BE} = 1.5 V to 8 V					50		
I _{CES}	V _{CE} = 150 V, V _{BE} = 0			50				μA
	V _{CE} = 200 V, V _{BE} = 0					50		
	V _{CE} = 150 V, V _{BE} = 0, T _C = 100°C			1				mA
	V _{CE} = 200 V, V _{BE} = 0, T _C = 100°C					1		
I _{CEO}	V _{CE} = 120 V, I _B = 0			50				μA
	V _{CE} = 150 V, I _B = 0					50		
I _{EBO}	V _{EB} = 5 V, I _C = 0			4				mA
V _{CE(sat)}	I _C = 4 A, I _B = 0.02 A, See Notes 3 and 4			1.2			1.2	V
	I _C = 7 A, I _B = 0.03 A, See Notes 3 and 4			1.5			1.5	
	I _C = 10 A, I _B = 0.05 A, See Notes 3 and 4			2			2	
	I _C = 10 A, I _B = 0.05 A, T _C = 100°C, See Notes 3 and 4			2			2	
				2			2	
V _{BE(sat)}	I _C = 4 A, I _B = 0.02 A, See Notes 3 and 4			1.8			1.8	V
	I _C = 7 A, I _B = 0.03 A, See Notes 3 and 4			1.9			1.9	
	I _C = 10 A, I _B = 0.05 A, See Notes 3 and 4			2.2			2.2	
	I _C = 10 A, I _B = 0.05 A, T _C = 100°C, See Notes 3 and 4			2.1			2.1	
				2.1			2.1	
V _F	I _F = 10 A, See Notes 3 and 4			3			3	V
h _{FE}	V _{CE} = 5 V, I _C = 500 mA, See Notes 3 and 4	60		500	60		500	
f _t	V _{CE} = 10 V, I _C = 500 mA, See Note 5		10			10		MHz
C _{obo}	V _{CB} = 20 V, I _E = 0, f = 0.1 MHz			90			90	pF

- NOTES: 2. Inductive loop switching measurement.
 3. These parameters are measured using pulse techniques, pulse duration = 300 μs, duty cycle = 2 %.
 4. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts located within 3,2 mm (0.125 inch) from the device body.
 5. To obtain f_t, the |h_{fe}| response is extrapolated at the rate of -6 dB per octave from f = 1 MHz to the frequency at which |h_{fe}| = 1.

TIPL Devices

thermal characteristics

PARAMETER	TIPL775			TIPL775A			UNIT
	MIN	TYP	MAX	MIN	TYP	MAX	
R _{θJC}			1.75			1.75	°C/W

8961726 TEXAS INSTR (OPTO)

62C 37101 D

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Inductive-load switching characteristics

T-33-29

PARAMETER	TEST CONDITIONS	TIPL775			TIPL775A			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
t_{si}	$I_C = 10 A, I_{B1} = 0.05 A, I_{B2} = -2.5 A$ $V_{BE(off)} = -5 V, \text{ See Figure 1}$	450	700		450	700	ns	
t_{rv}		160	250		160	250	ns	
t_{fi}		250	400		250	400	ns	
t_{ti}		280	450		280	450	ns	
t_{xo}		320	500		320	500	ns	

PARAMETER MEASUREMENT INFORMATION

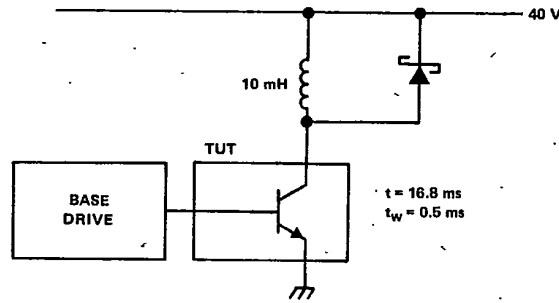


FIGURE 1. INDUCTIVE-LOAD SWITCHING — Collector Test Circuit

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62C 37102 D

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T-33-29

TYPICAL CHARACTERISTICS

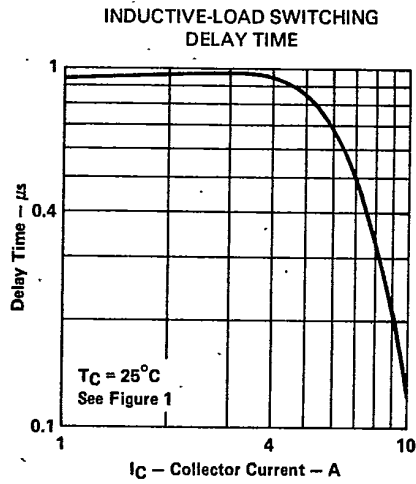


FIGURE 2

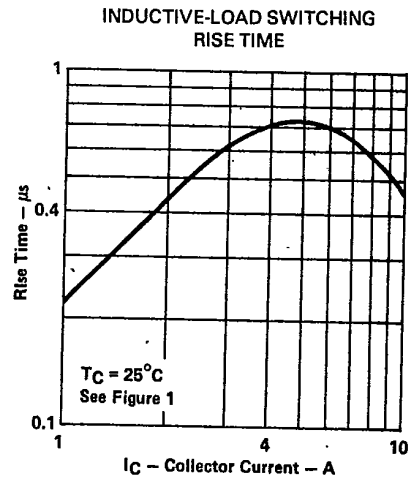


FIGURE 3

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

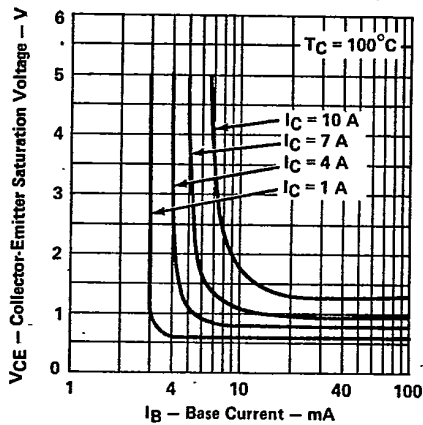


FIGURE 4

INDUCTIVE-LOAD SWITCHING
RECOMMENDED BASE DRIVE

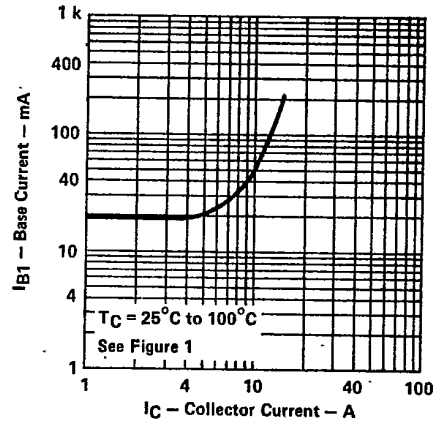


FIGURE 5

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8961726 TEXAS INSTR (OPTO)

62C 37103 D

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TYPICAL CHARACTERISTICS

T-33-29

BASE-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

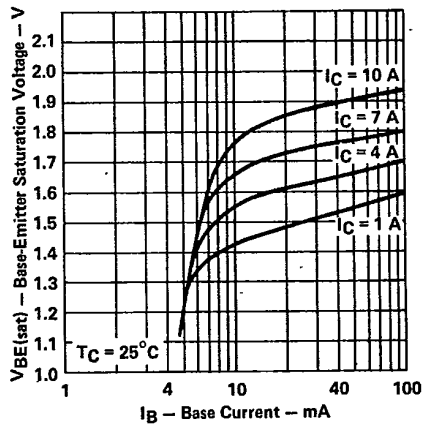


FIGURE 6

STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

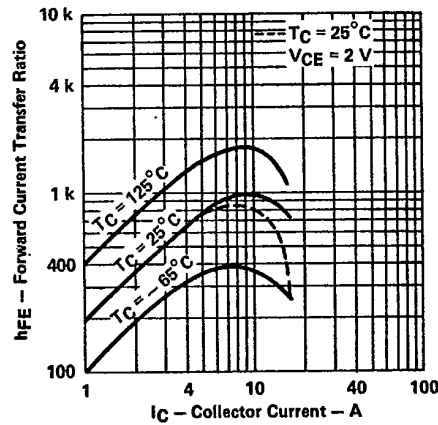


FIGURE 7

COLLECTOR CUTOFF CURRENT
vs
TEMPERATURE

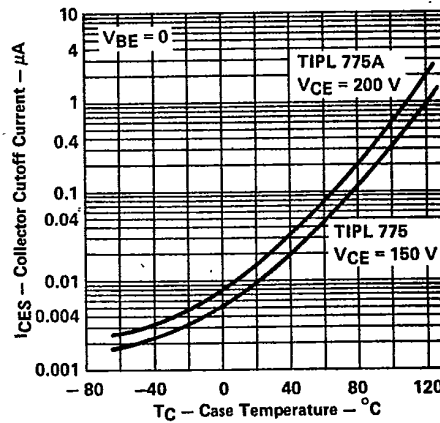


FIGURE 8

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6

8961726 TEXAS INSTR (OPTO)

62C 37104 D 1

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T-33-29

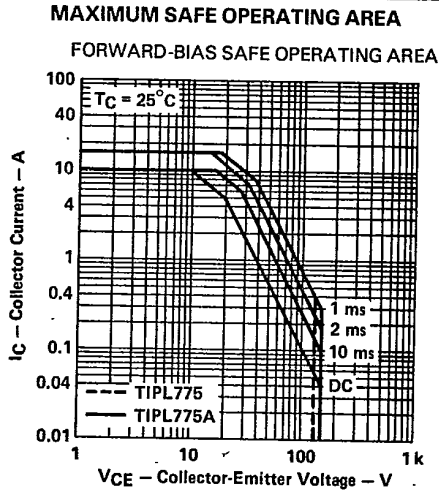


FIGURE 9

THERMAL INFORMATION
DISSIPATION DERATING CURVE

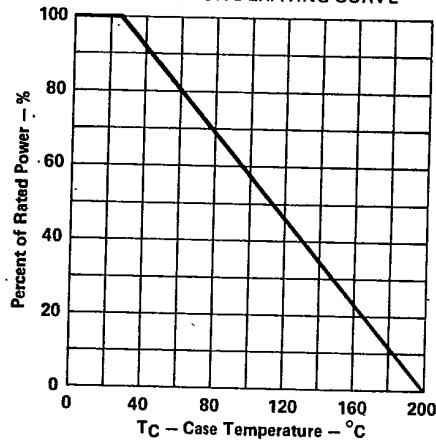


FIGURE 10

TIPL Devices

