

STD1802

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

Table 1: GENERAL FEATURES

Ordering Code	Marking	Shipment		
STD1802T4	D1802	Tape & Reel		

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- SURFACE-MOUNTING DPAK POWER PACKAGE IN TAPE & REEL (Suffix "T4")

APPLICATIONS:

- CCFL DRIVERS
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS

DESCRIPTION

The device is manufactured in NPN Planar Technology by using a "Base Island" layout.

The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.





Table 2: ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage $(I_E = 0)$	80	V
Vceo	Collector-Emitter Voltage ($I_B = 0$)	60	V
V _{EBO}	Emitter-Base Voltage $(I_C = 0)$	6	V
Ιc	Collector Current	3	А
Ісм	Collector Peak Current (t _p < 5 ms)	6	А
Ι _Β	Base Current	1	А
P _{tot}	Total Dissipation at $T_{case} = 25 \ ^{\circ}C$	15	W
T _{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

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Table 3: THERMAL DATA

R _{thi-case}	Thermal Resistance Junction-case	Мах	8.33	°C/W

Table 4: ELECTRICAL CHARACTERISTICS ($T_{case} = 25 \, {}^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Con	Min.	Тур.	Max.	Unit	
І _{СВО}	Collector Cut-off Current (I _E = 0)	V _{CB} = 40 V				0.1	μA
I _{EBO}	Emitter Cut-off Current $(I_C = 0)$	$V_{EB} = 4 V$				0.1	μA
V _{(BR)CBO}	Collector-Base Breakdown Voltage (I _E = 0)	Ic = 100 μA		80			V
V _{(BR)CEO*}	Collector-Emitter Breakdown Voltage (I _B = 0)	I _C = 1 mA		60			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage (I _C = 0)	I _E = 100 μA		6			V
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	$I_{C} = 2 A$ $I_{C} = 3 A$	I _B = 100 mA I _B = 150 mA		150 200	300 400	mV mV
V _{BE(sat)} *	Base-Emitter Saturation Voltage	I _C = 2 A	I _B = 100 mA		0.9	1.2	V
h _{FE} *	DC Current Gain	I _C = 100 mA I _C = 3 A	V _{CE} = 2 V V _{CE} = 2 V	200 100		400	
f _T	Transition frequency	V _{CE} = 10 V	I _C = 50 mA		150		MHz
Ссво	Collector-Base Capacitance	V _{CB} = 10 V	f = 1 MHz		50		pF
t _{ON} t _s t _f	RESISTIVE LOAD Turn- on Time Storage Time Fall Time	$I_{C} = 1 A$ $I_{B1} = -I_{B2} = 0.1 A$	Vcc = 30 V		50 1.35 120		ns μs ns

* Pulsed: Pulse duration = 300µs, duty cycle = 1.5 %

Figure 1: Derating Curve



Figure 3: Collector-Emitter Saturation Voltage



Figure 5: Base-Emitter Saturation Voltage



Figure 2: DC Current Gain



Figure 4: Collector-Emitter Saturation Voltage



Figure 6: Base-Emitter On Voltage



DG12730 t_s(ns) 2500 $V_{cc} = 10V$ $V_{BB(off)} = -5V$ 2000 $|_{B(on)} = -|_{B(off)}$ $h_{FE} = 10$ t_(on)=300µs 1500 1000 500 L 0 0.5 1.5 2 2.5 $I_{C}(A)$ 1

Figure 7: Switching Times Resistive Load

Figure 9: Switching Times Resistive Load



Figure 11: Switching Times Inductive Load



Figure 8: Switching Times Resistive Load



Figure 10: Switching Times Inductive Load



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Figure 12: Resistive Load Switching Test Circuit.



Table 5: Revision History

Date	Revision	Description of Changes
12 July 2004	1	Third Revision

TO-252 (DPAK) MECHANICAL DATA

DIM	mm			inch			
Diwi.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
А	2.20		2.40	0.087		0.094	
A1	0.90		1.10	0.035		0.043	
A2	0.03		0.23	0.001		0.009	
В	0.64		0.90	0.025		0.035	
B2	5.20		5.40	0.204		0.213	
С	0.45		0.60	0.018		0.024	
C2	0.48		0.60	0.019		0.024	
D	6.00		6.20	0.236		0.244	
E	6.40		6.60	0.252		0.260	
G	4.40		4.60	0.173		0.181	
Н	9.35		10.10	0.368		0.398	
L2		0.8			0.031		
L4	0.60		1.00	0.024		0.039	
V2	0°		8°	0°		0 [°]	



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