



STD878T4

HIGH CURRENT, HIGH PERFORMANCE, LOW VOLTAGE NPN TRANSISTOR

Features

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- DC CURRENT GAIN, $h_{FE} > 100$
- 5 A CONTINUOUS COLLECTOR CURRENT
- SURFACE-MOUNTING DPAK (TO-252)
- POWER PACKAGE IN TAPE & REEL

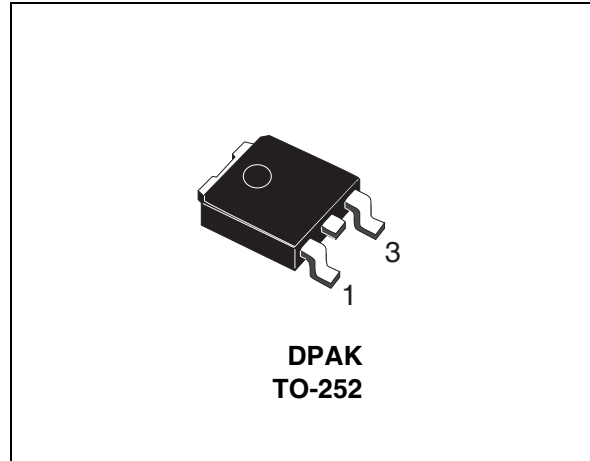
Applications

- POWER MANAGEMENT IN PORTABLE EQUIPMENT
- VOLTAGE REGULATION IN BIAS SUPPLY CIRCUITS
- SWITCHING REGULATOR IN BATTERY CHARGER APPLICATIONS
- HEAVY LOAD DRIVER

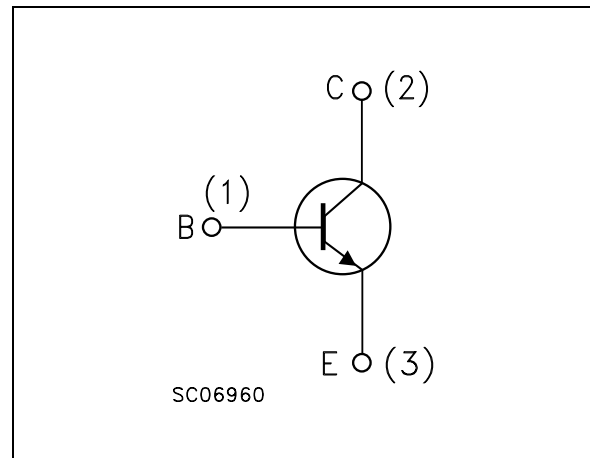
Description

The device is manufactured in low voltage NPN Planar technology by using a "Base Island" layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

Preliminary Data



Internal Schematic Diagram



Order Codes

Part Number	Marking	Package	Packing
STD878T4	D878	DPAK (TO-252)	Tape & Reel

1 Absolute Maximum Ratings

Table 1. Absolute Maximum Rating

Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage ($I_E = 0$)	45	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	30	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	6	V
I_C	Collector Current	5	A
I_{CM}	Collector Peak Current ($t_P < 5\text{ms}$)	10	A
P_{TOT}	Total dissipation at $T_C = 25^\circ\text{C}$	15	W
T_{stg}	Storage Temperature	-65 to 150	$^\circ\text{C}$
T_J	Max. Operating Junction Temperature	150	$^\circ\text{C}$

Table 2. Thermal Data

Symbol	Parameter	Value	Unit
$R_{thJ-case}$	Thermal Resistance Junction-Case Max	8.33	$^\circ\text{C/W}$

2 Electrical Characteristics

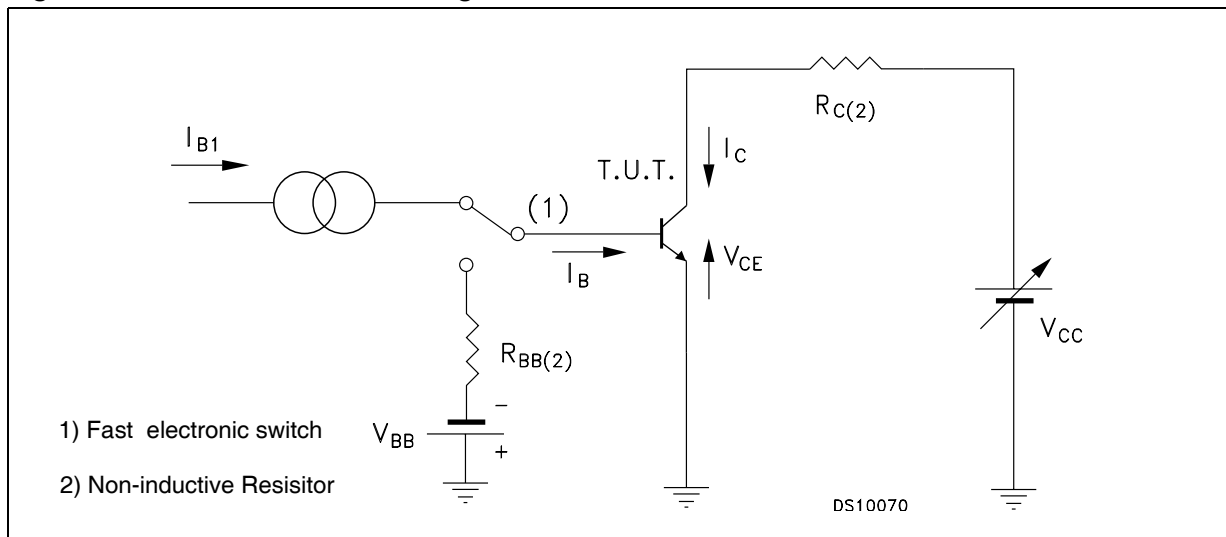
Table 3. Electrical Characteristics ($T_{CASE} = 25^{\circ}C$; unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current ($I_E = 0$)	$V_{CB} = 30\text{ V}$			10	μA
		$V_{CB} = 30\text{ V}$ $T_j = 100^{\circ}C$			100	μA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 6\text{ V}$			10	μA
$V_{(BR)CEO}$ <i>Note: 1</i>	Collector-Emitter Breakdown Voltage ($I_B = 0$)	$I_C = 10\text{ mA}$	30			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_E = 0$)	$I_C = 100\ \mu A$	45			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_C = 0$)	$I_E = 100\ \mu A$	6			V
$V_{CE(sat)}$ <i>Note: 1</i>	Collector-Emitter Saturation Voltage	$I_C = 500\text{ mA}$ $I_B = 5\text{ mA}$			0.15	V
		$I_C = 2\text{ A}$ $I_B = 50\text{ mA}$			0.35	V
		$I_C = 5\text{ A}$ $I_B = 250\text{ mA}$			0.70	V
		$I_C = 6\text{ A}$ $I_B = 250\text{ mA}$		0.7		V
		$I_C = 8\text{ A}$ $I_B = 400\text{ mA}$		1.0		V
		$I_C = 10\text{ A}$ $I_B = 500\text{ mA}$		1.2		V
$V_{BE(sat)}$ <i>Note: 1</i>	Base-Emitter Saturation Voltage	$I_C = 2\text{ A}$ $I_B = 50\text{ mA}$			1.1	V
		$I_C = 6\text{ A}$ $I_B = 250\text{ mA}$		1.2		V
h_{FE} <i>Note: 1</i>	DC Current Gain	$I_C = 10\text{ mA}$ $V_{CE} = 1\text{ V}$	120	200	300	
		$I_C = 500\text{ mA}$ $V_{CE} = 1\text{ V}$	100	200		
		$I_C = 5\text{ A}$ $V_{CE} = 1\text{ V}$	70	100		
		$T_j = 100^{\circ}C$		100		
		$I_C = 8\text{ A}$ $V_{CE} = 1\text{ V}$		55		
		$I_C = 10\text{ A}$ $V_{CE} = 1\text{ V}$		35		
t_d t_r t_s t_f	RESISTIVE LOAD	$V_{CC} = 20\text{ V}$ $I_C = 3\text{ A}$ $I_{B1} = - I_{B2} = 60\text{ mA}$ (see figure 1)				
	Delay Time			180	220	ns
	Rise Time			160	210	ns
	Storage Time			250	300	ns
	Fall Time		80	100	ns	

Note: 1 Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$.

3 Test Circuits

Figure 1. Resistive Load Switching Test Circuit

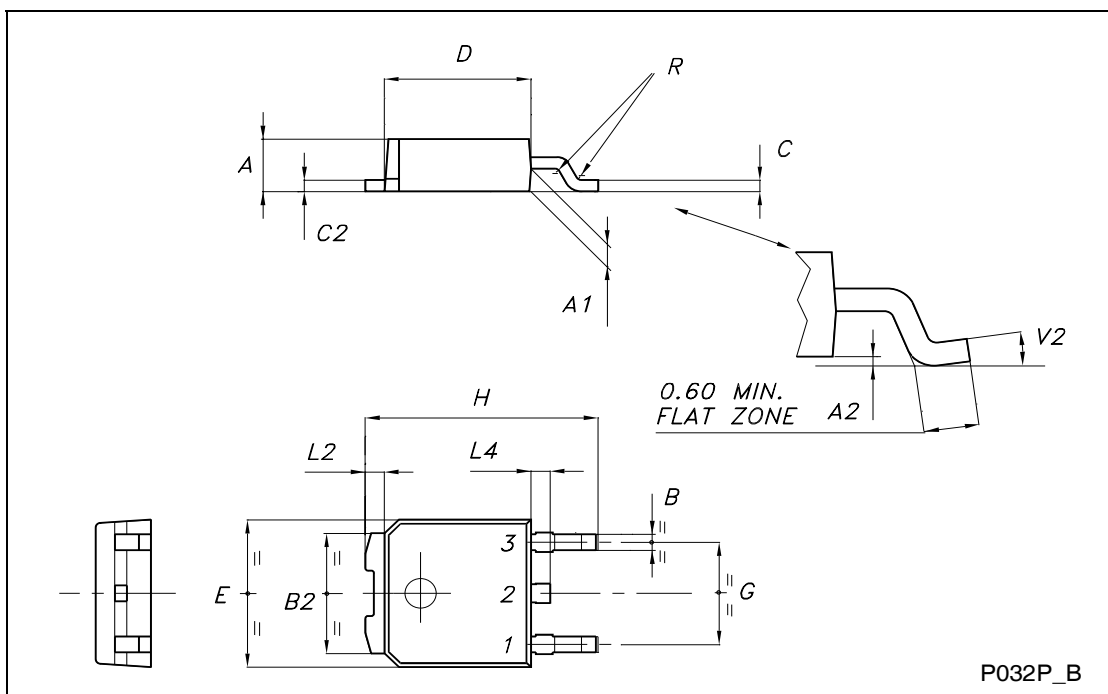


4 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

TO-252 (DPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	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
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	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
H	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°



5 Revision History

Date	Revision	Changes
24-Nov-2005	1	Initial Release

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