

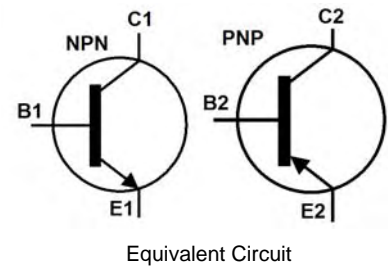
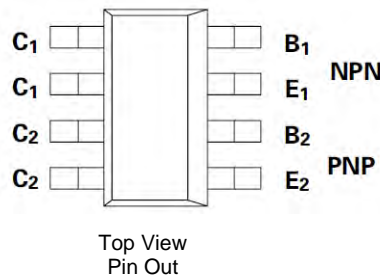
**COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTOR IN SM-8 PACKAGE**

**Features**

- NPN Transistor
  - $BV_{CEO} > 45$
  - $V_{CE(sat)} < 100mV @ I_C = 100mA$
  - Continuous Current  $I_C = 2A$
- PNP Transistor
  - $BV_{CEO} > -40V$
  - $V_{CE(sat)} < 250mV @ I_C = -500mA$
  - Continuous Current  $I_C = -2A$
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SM-8 (8 LEAD SOT223)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (E3)
- Weight: 0.117 grams (approximate)

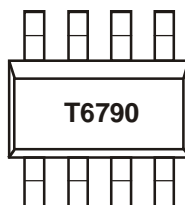


**Ordering Information** (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZDT6790TA	T6790	7	12	1,000
ZDT6790TC	T6790	13	12	4,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com>

**Marking Information**



T6790 = Product Type Marking Code

### Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

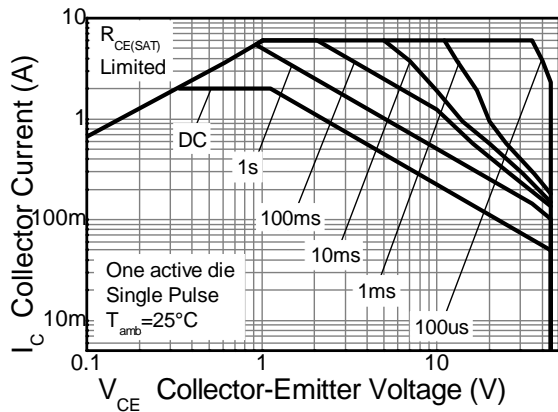
Characteristic	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V <sub>CBO</sub>	45	-50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	45	-40	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	-6	V
Continuous Collector Current	I <sub>C</sub>	2	-2	A
Peak Pulse Current (Note 5)	I <sub>CM</sub>	6	-6	A

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

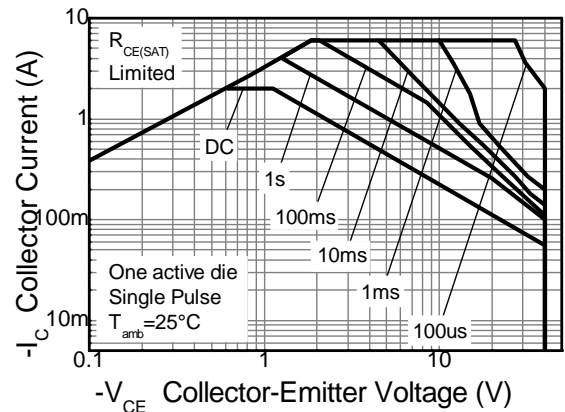
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P <sub>D</sub>	(Note 5) 2.25	W
		(Note 6) 2.75	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5) 55.60	°C/W
		(Note 6) 45.50	
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	30.68	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
5. For the device with any single die active, mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions .
  6. For the device with both die active, mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).

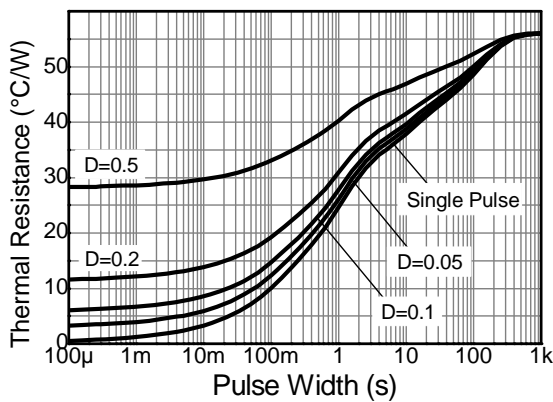
**Thermal Characteristics**



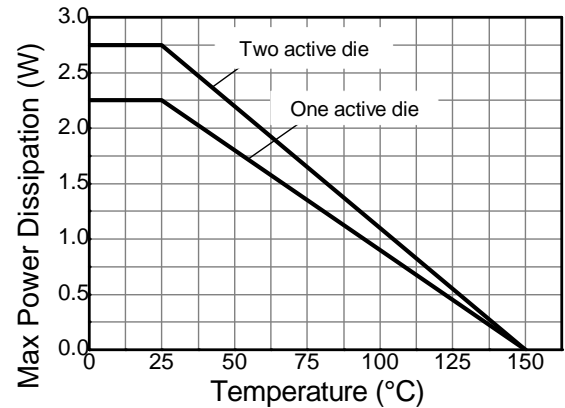
**NPN Safe Operating Area**



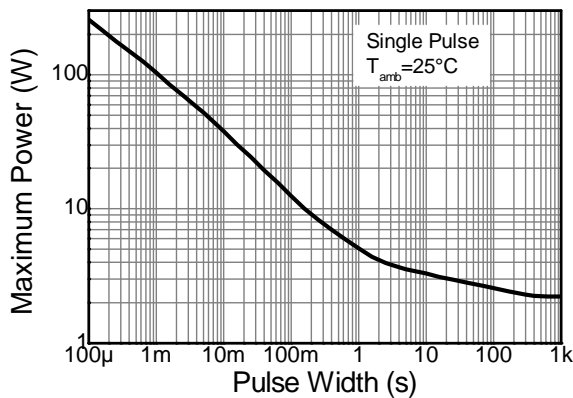
**PNP Safe Operating Area**



**Transient Thermal Impedance**



**Derating Curve**



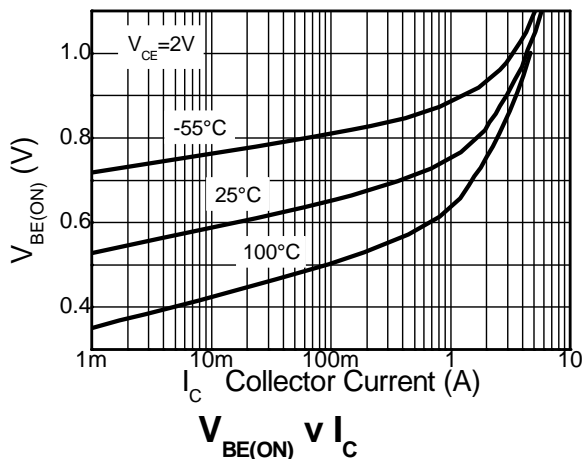
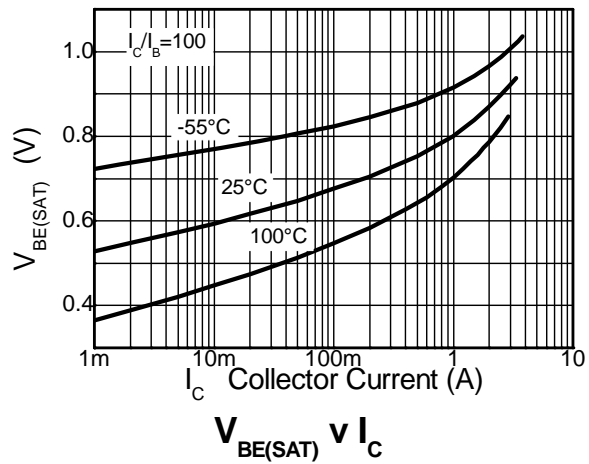
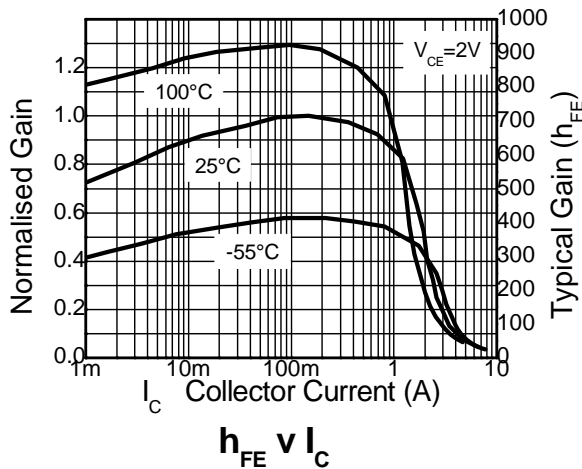
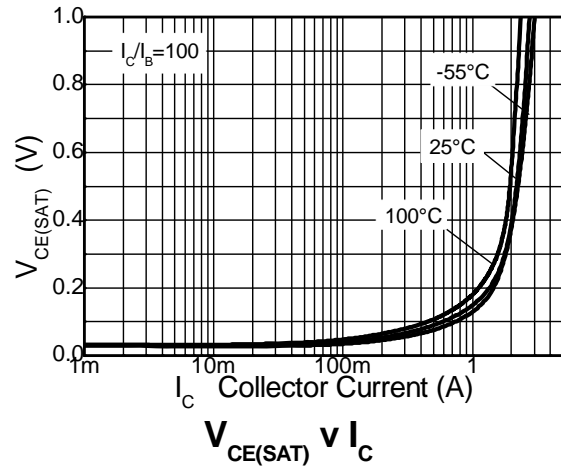
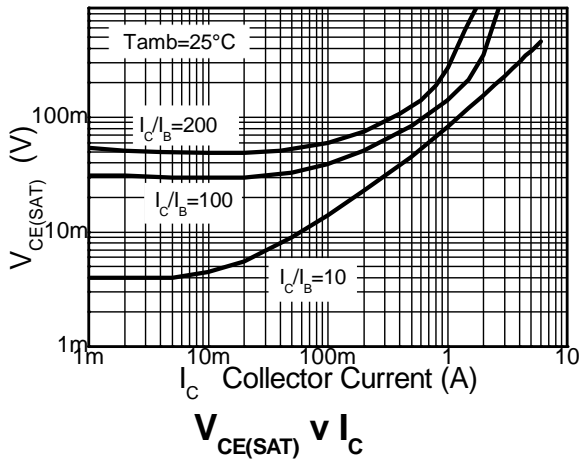
**Pulse Power Dissipation**

**NPN - Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	45	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV <sub>CEO</sub>	45	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	6	—	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CB0</sub>	—	—	100	nA	V <sub>CB</sub> = 35V
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	100	nA	V <sub>EB</sub> = 5V
DC Current Transfer Static Ratio (Note 8)	h <sub>FE</sub>	500	—	—	—	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 2V
		400	—	—		I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		150	—	—		I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 8)	V <sub>CE(sat)</sub>	—	—	100	mV	I <sub>C</sub> = 100mA, I <sub>B</sub> = 0.5mA
		—	—	500		I <sub>C</sub> = 1A, I <sub>B</sub> = 5mA
Base-Emitter Saturation Voltage (Note 8)	V <sub>BE(sat)</sub>	—	—	900	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 10mA
Base-Emitter Turn-on Voltage (Note 8)	V <sub>BE(on)</sub>	—	—	900	mV	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
Transitional Frequency (Note 8)	f <sub>T</sub>	150	—	—	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V, f = 50MHz
Input Capacitance	C <sub>ibo</sub>	—	200	—	pF	V <sub>EB</sub> = 0.5V, f = 1MHz
Output Capacitance	C <sub>obo</sub>	—	16	—	pF	V <sub>CB</sub> = 10V, f = 1MHz
Switching Time	t <sub>on</sub>	—	33	—	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 500mA, I <sub>B1</sub> = 50mA, I <sub>B2</sub> = 50mA
	t <sub>off</sub>		1300		ns	

Note: 8. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

**NPN – Typical Electrical Characteristics**

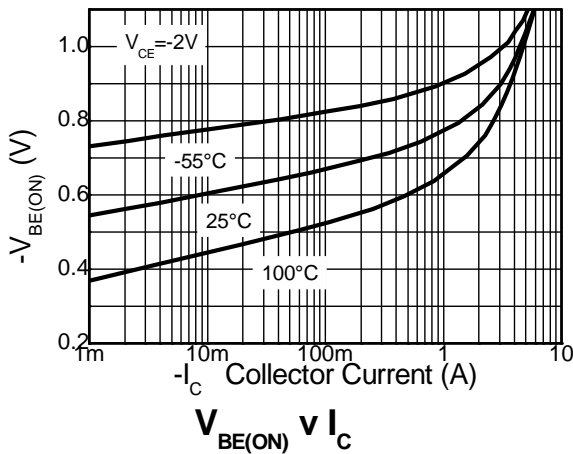
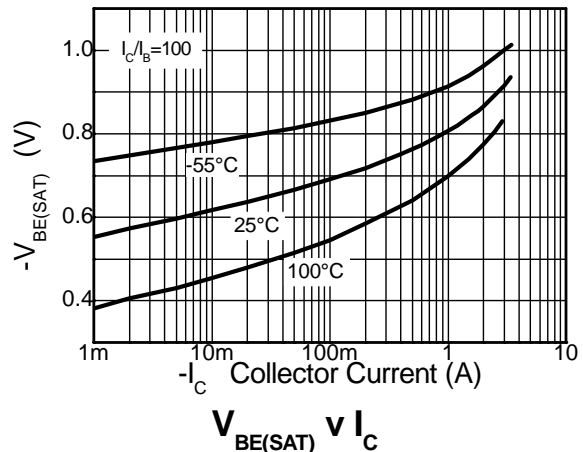
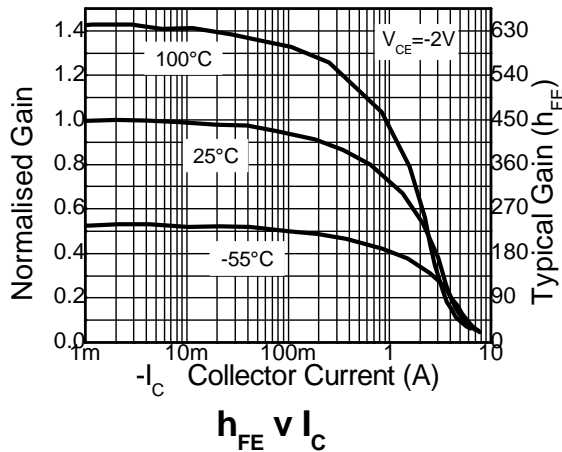
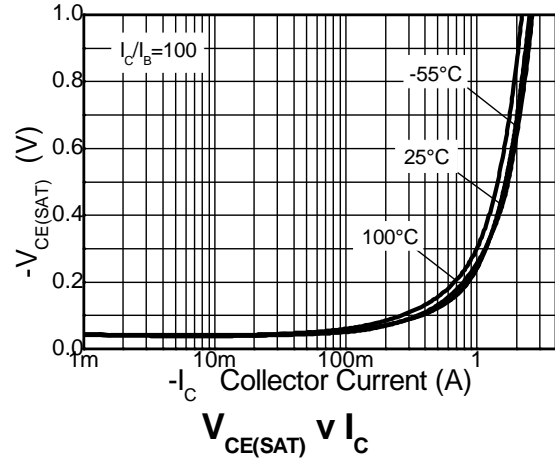
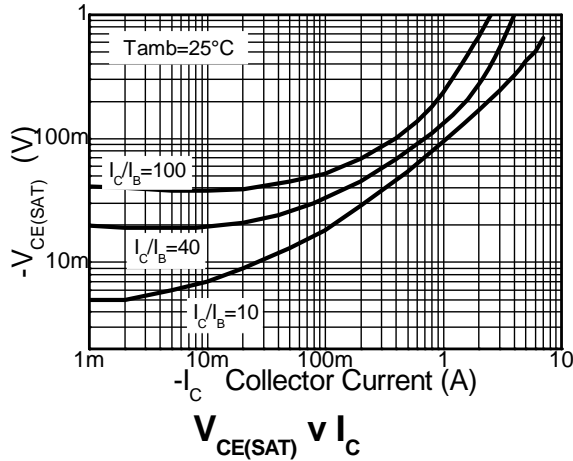


**PNP - Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

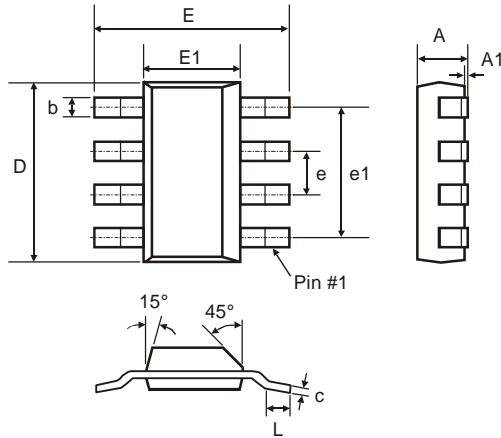
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Notes 8)	$BV_{CEO}$	-40	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-6	—	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	—	—	-100	nA	$V_{CB} = -30\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5\text{V}$
DC Current Transfer Static Ratio (Notes 8)	$h_{FE}$	300	—	800	—	$I_C = -10\text{mA}, V_{CE} = -2\text{V}$
		250	—	—		$I_C = -500\text{mA}, V_{CE} = -2\text{V}$
		200	—	—		$I_C = -1\text{A}, V_{CE} = -2\text{V}$
		150	—	—		$I_C = -2\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Notes 8)	$V_{CE(sat)}$	—	—	-250	mV	$I_C = -500\text{mA}, I_B = -5\text{mA}$
		—	—	-450		$I_C = -1\text{A}, I_B = -10\text{mA}$
		—	—	-750		$I_C = -2\text{A}, I_B = -50\text{mA}$
Base-Emitter Saturation Voltage (Notes 8)	$V_{BE(sat)}$	—	—	-1000	mV	$I_C = -1\text{A}, I_B = -10\text{mA}$
Base-Emitter Turn-on Voltage (Notes 8)	$V_{BE(on)}$	—	-750	—	mV	$I_C = -1\text{A}, V_{CE} = -2\text{V}$
Transitional Frequency (Notes 8)	$f_T$	100	—	—	MHz	$I_C = -50\text{mA}, V_{CE} = -5\text{V}, f = 50\text{MHz}$
Input Capacitance	$C_{ibo}$	—	225	—	pF	$V_{EB} = -0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{obo}$	—	24	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Switching Time	$t_{on}$	—	35	—	ns	$V_{CC} = -10\text{V}, I_C = -500\text{mA}$
	$t_{off}$	—	600	—	ns	$I_{B1} = -50\text{mA}, I_{B2} = -50\text{mA}$

Notes: 8. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq$  2%.

**PNP – Typical Electrical Characteristics**



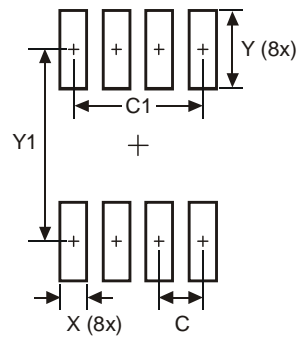
**Package Outline Dimensions**



SM-8			
Dim	Min	Max	Typ
A	-	1.7	-
A1	0.02	0.1	-
b	-	0.7	-
c	0.24	0.32	-
D	6.3	6.7	-
e	-	-	1.53
e1	-	-	4.59
E	6.7	7.3	-
E1	3.3	3.7	-
L	0.9	-	-

All Dimensions in mm

**Suggested Pad Layout**



Dimensions	Value (in mm)
C	1.52
C1	4.6
X	0.95
Y	2.80
Y1	6.80



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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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