

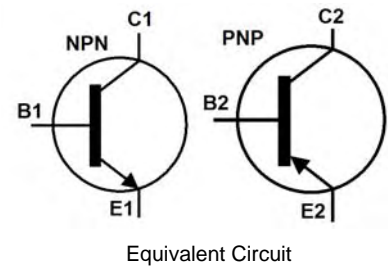
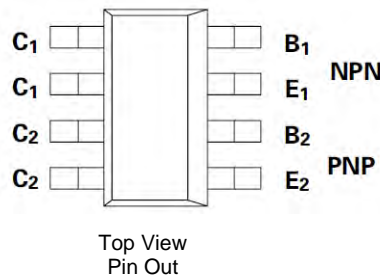
COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTOR IN SM-8 PACKAGE

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)

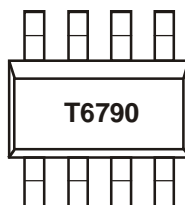


Ordering Information (Note 4)

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_A = +25°C, unless otherwise specified.)

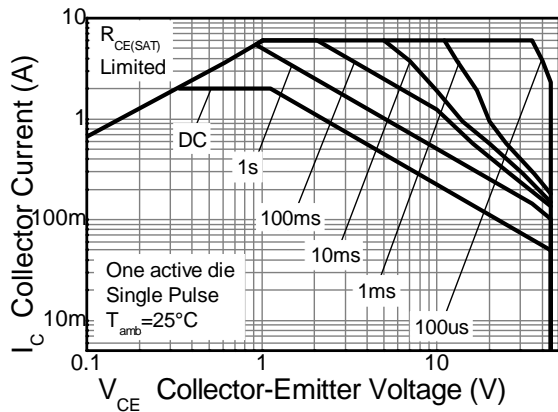
Characteristic	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V _{CBO}	45	-50	V
Collector-Emitter Voltage	V _{CEO}	45	-40	V
Emitter-Base Voltage	V _{EBO}	6	-6	V
Continuous Collector Current	I _C	2	-2	A
Peak Pulse Current (Note 5)	I _{CM}	6	-6	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

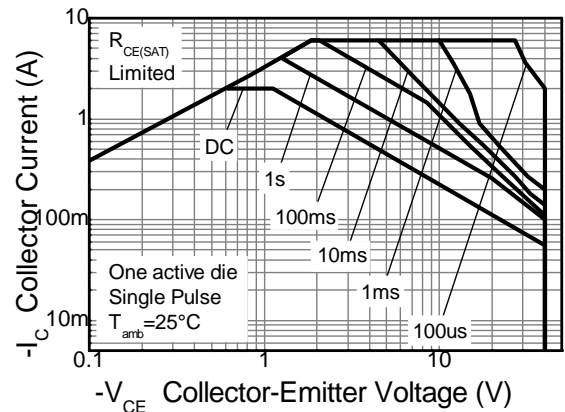
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P _D	(Note 5) 2.25	W
		(Note 6) 2.75	
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5) 55.60	°C/W
		(Note 6) 45.50	
Thermal Resistance, Junction to Leads	R _{θJL}	30.68	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 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).

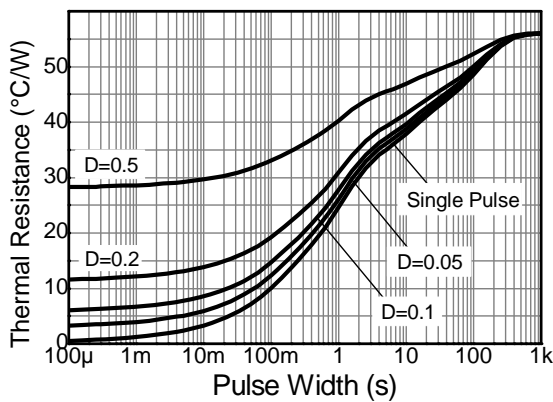
Thermal Characteristics



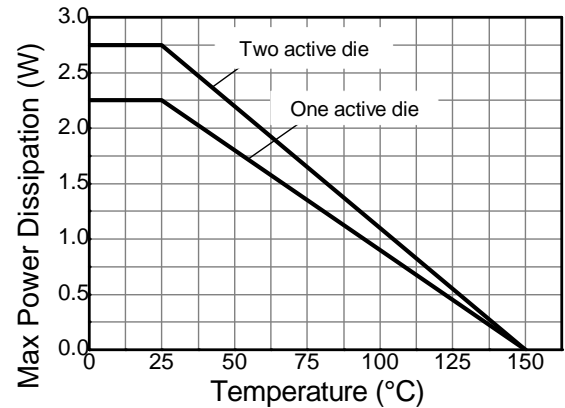
NPN Safe Operating Area



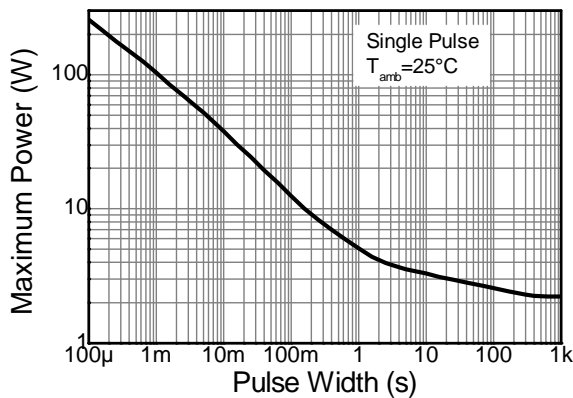
PNP Safe Operating Area



Transient Thermal Impedance



Derating Curve



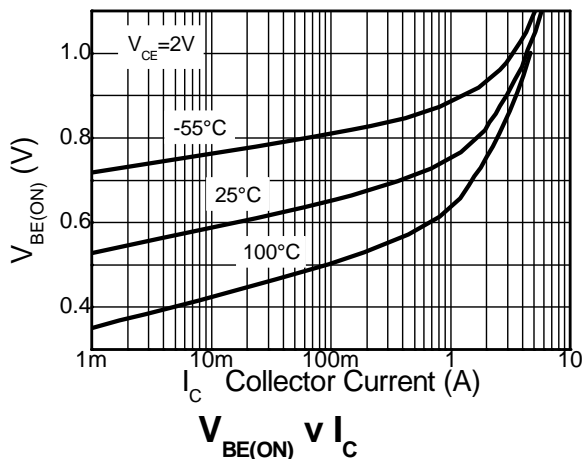
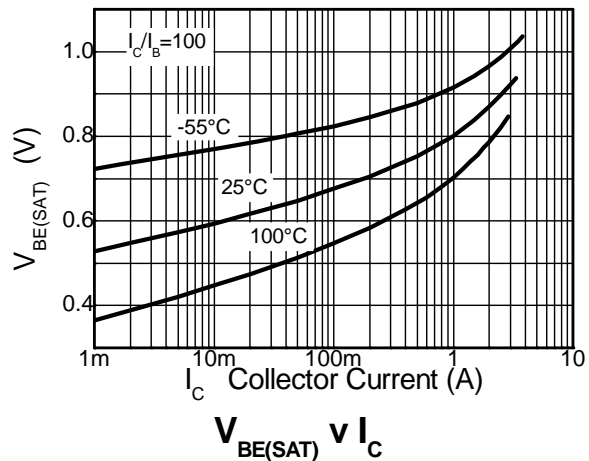
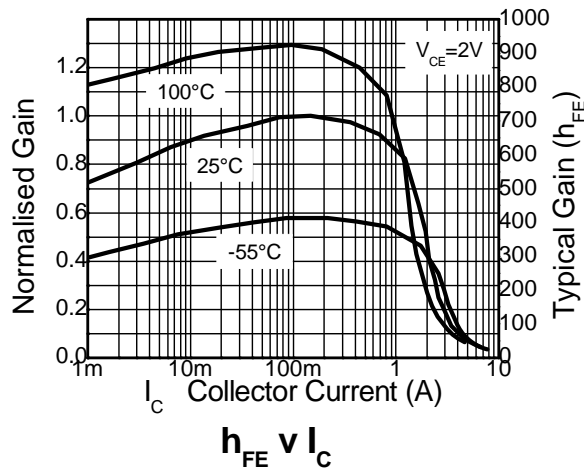
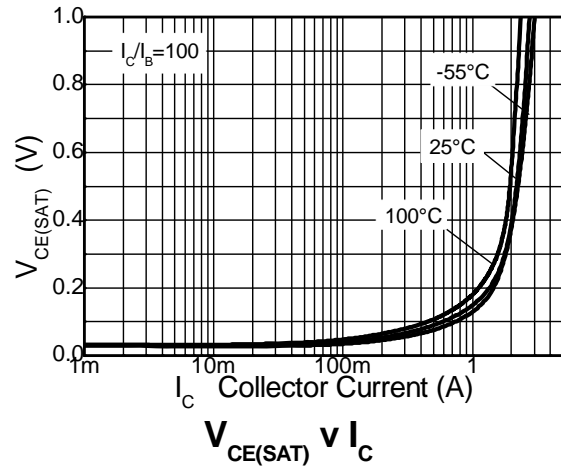
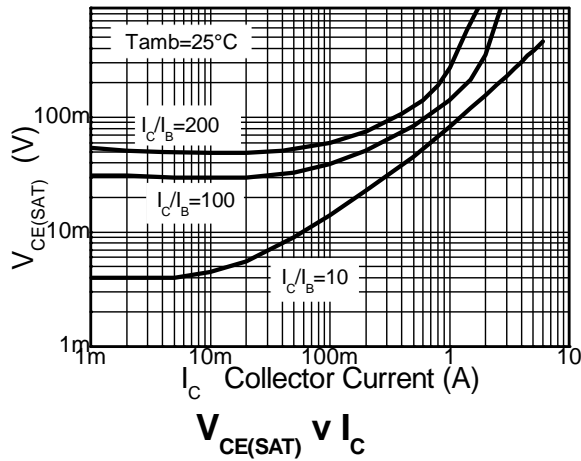
Pulse Power Dissipation

NPN - Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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

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

NPN – Typical Electrical Characteristics

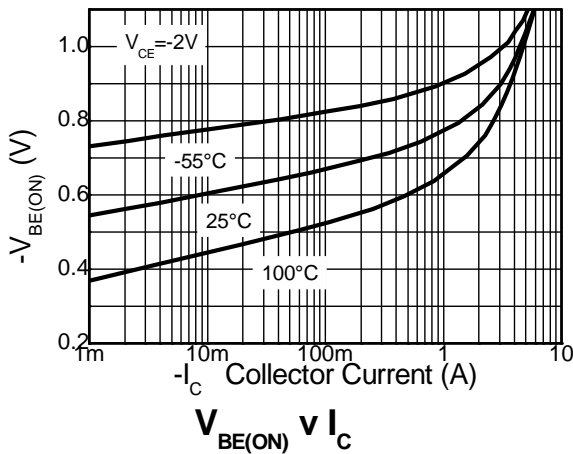
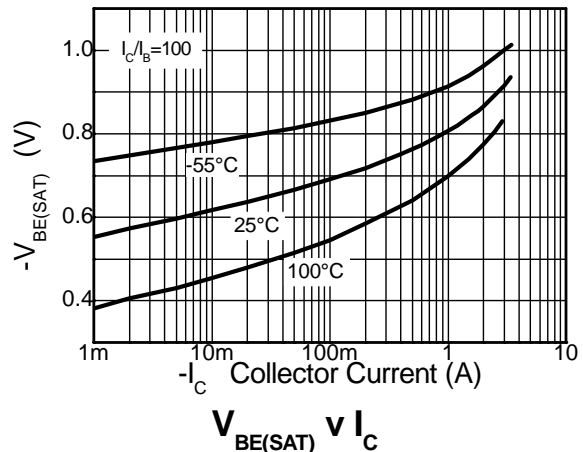
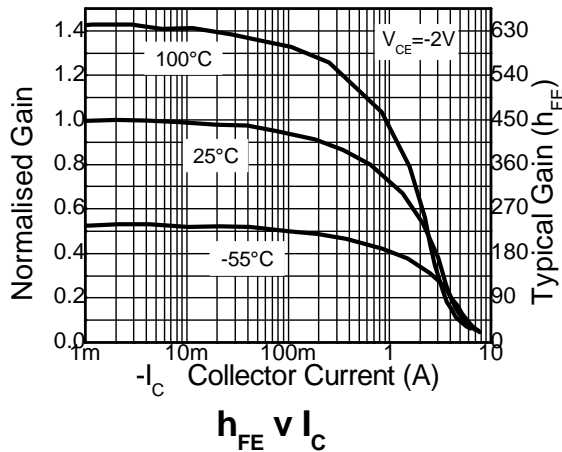
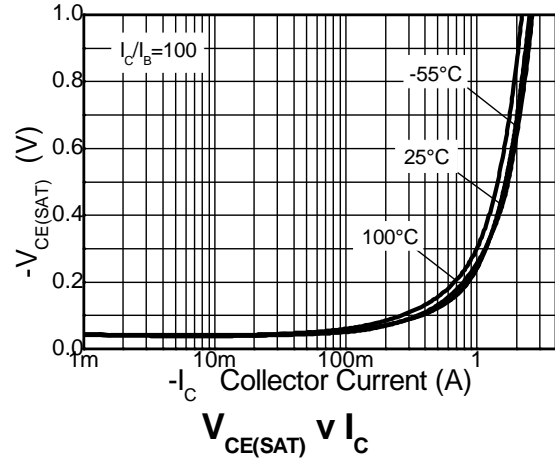
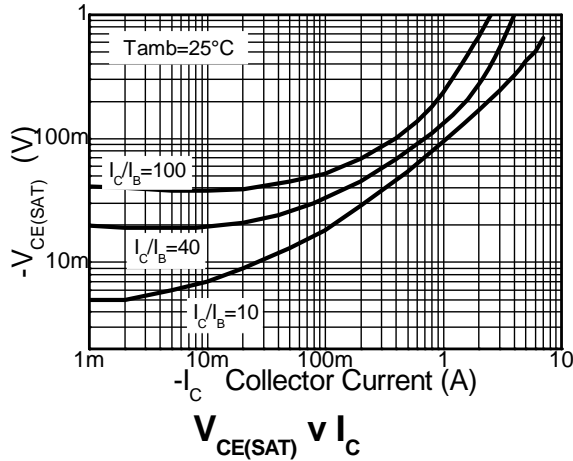


PNP - Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

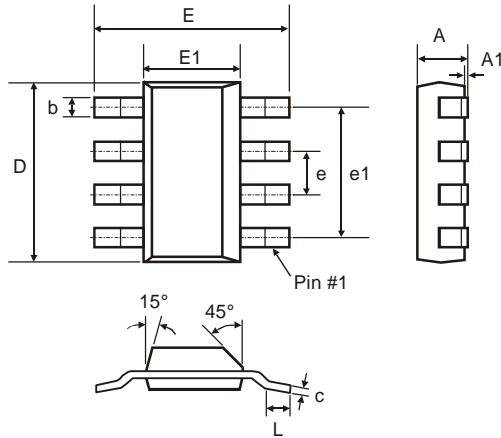
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-50	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Notes 8)	BV _{CEO}	-40	—	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-6	—	—	V	I _E = -100μA
Collector Cutoff Current	I _{CB0}	—	—	-100	nA	V _{CB} = -30V
Emitter Cutoff Current	I _{EBO}	—	—	-100	nA	V _{EB} = -5V
DC Current Transfer Static Ratio (Notes 8)	h _{FE}	300	—	800	—	I _C = -10mA, V _{CE} = -2V
		250	—	—		I _C = -500mA, V _{CE} = -2V
		200	—	—		I _C = -1A, V _{CE} = -2V
		150	—	—		I _C = -2A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Notes 8)	V _{CE(sat)}	—	—	-250	mV	I _C = -500mA, I _B = -5mA
		—	—	-450		I _C = -1A, I _B = -10mA
		—	—	-750		I _C = -2A, I _B = -50mA
Base-Emitter Saturation Voltage (Notes 8)	V _{BE(sat)}	—	—	-1000	mV	I _C = -1A, I _B = -10mA
Base-Emitter Turn-on Voltage (Notes 8)	V _{BE(on)}	—	-750	—	mV	I _C = -1A, V _{CE} = -2V
Transitional Frequency (Notes 8)	f _T	100	—	—	MHz	I _C = -50mA, V _{CE} = -5V, f = 50MHz
Input Capacitance	C _{ibo}	—	225	—	pF	V _{EB} = -0.5V, f = 1MHz,
Output Capacitance	C _{obo}	—	24	—	pF	V _{CB} = -10V, f = 1MHz,
Switching Time	t _{on}	—	35	—	ns	V _{CC} = -10V, I _C = -500mA, I _{B1} = -50mA, I _{B2} = -50mA
	t _{off}	—	600	—	ns	

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

PNP – Typical Electrical Characteristics

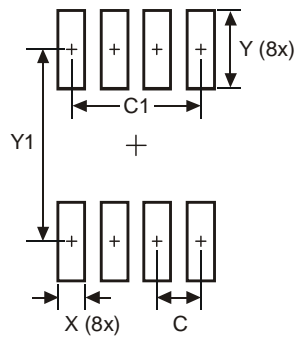


Package Outline Dimensions



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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