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# ZDT1048

## SM-8 Dual NPN medium power high gain transistors

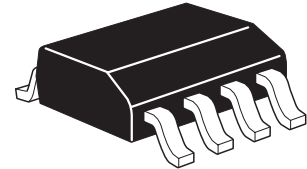
### Summary

$BV_{CEO} > 17.5V$

$I_{C(cont)} = 5A$

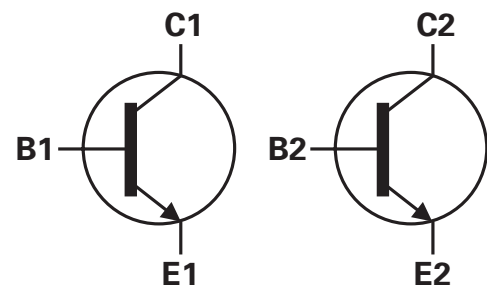
$V_{CE(sat)} < 75mV @ 1A$

$P_D = 2.75W$



### Description

Advanced process capability has been used to achieve this high performance device. Combining two NPN transistors in the SM-8 package provides a compact solution for the intended applications.



### Features

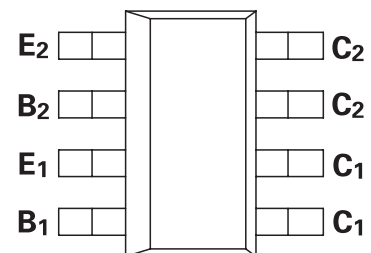
- Dual NPN device
- Very low saturation voltage
- High gain
- SM 8 package

### Applications

- CCFL invertors
- Royer circuits

### Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZDT1048TA	7	12	1000



### Device marking

T1048

## Absolute maximum ratings

Parameter	Symbol	Value	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	17.5	V
Emitter-base voltage	$V_{EBO}$	5	V
Peak pulse current	$I_{CM}$	20	A
Continuous collector current	$I_C$	5	A
Base current	$I_B$	500	mA
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	°C

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Total power dissipation at $T_{amb} = 25^\circ\text{C}^*$	$P_{tot}$	2.25	W
Any single die "on"		2.75	W
Both die "on" equally			V
Derate above $25^\circ\text{C}^*$		18	mW/°C
Any single die "on"		22	mW/°C
Both die "on" equally			
Thermal resistance - junction to ambient*		55.6	°C/W
Any single die "on"		45.5	°C/W
Both die "on" equally			

\* The power which can be dissipated assuming the device is mounted in a typical manner on a PCB with copper equal to 2 inches square.

## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

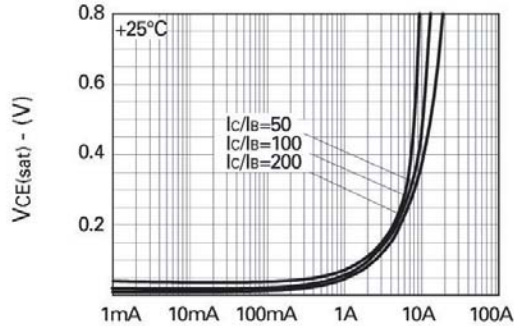
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	50	85		V	$I_C=100\mu\text{A}$
Collector-emitter breakdown voltage	$V_{CES}$	50	85		V	$I_C=100\mu\text{A}$
Collector-emitter breakdown voltage	$V_{CEO}$	17.5	24		V	$I_C=10\text{mA}$
Collector-emitter breakdown voltage	$V_{CEV}$	50	85		V	$I_C=100\mu\text{A}$ , $V_{EB}=1\text{V}$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5	8.7		V	$I_E=100\mu\text{A}$
Collector cut-off current	$I_{CBO}$		0.3	10	nA	$V_{CB}=35\text{V}$
Emitter cut-off current	$I_{EBO}$		0.3	10	nA	$V_{EB}=4\text{V}$
Collector-emitter cut-off current	$I_{CES}$		0.3	10	nA	$I_{CES}=35\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		27	45	mV	$I_C=0.5\text{A}$ , $I_B=10\text{mA}$ (*)
			55	75	mV	$I_C=1\text{A}$ , $I_B=10\text{mA}$ (*)
			120	160	mV	$I_C=2\text{A}$ , $I_B=10\text{mA}$ (*)
			200	240	mV	$I_C=5\text{A}$ , $I_B=100\text{mA}$ (*)
			200	300	mV	$I_C=5\text{A}$ , $I_B=50\text{mA}$ (*)
Base-emitter saturation voltage	$V_{BE(sat)}$		1000	1100	mV	$I_C=5\text{A}$ , $I_B=100\text{mA}$ (*)
Base-emitter turn on voltage	$V_{BE(on)}$		900	1000	mV	$I_C=5\text{A}$ , $V_{CE}=2\text{V}$ (*)
Static forward current transfer ratio	$h_{FE}$	280	440	1200		$I_C=10\text{mA}$ , $V_{CE}=2\text{V}$ (*)
		300	450			$I_C=0.5\text{A}$ , $V_{CE}=2\text{V}$ (*)
		300	450			$I_C=1\text{A}$ , $V_{CE}=2\text{V}$ (*)
		250	300			$I_C=5\text{A}$ , $V_{CE}=2\text{V}$ (*)
		50	80			$I_C=20\text{A}$ , $V_{CE}=2\text{V}$ (*)
Transition frequency	$f_T$		150		MHz	$I_C=50\text{mA}$ , $V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output capacitance	$C_{obo}$		60	80	pF	$V_{CB}=10\text{V}$ , $f=1\text{MHz}$
Switching times	$t_{on}$		120		ns	$I_C=4\text{A}$ , $I_B=40\text{mA}$ , $V_{CC}=10\text{V}$
	$t_{off}$		250		ns	$I_C=4\text{A}$ , $I_B=\pm 40\text{mA}$ , $V_{CC}=10\text{V}$

### NOTES:

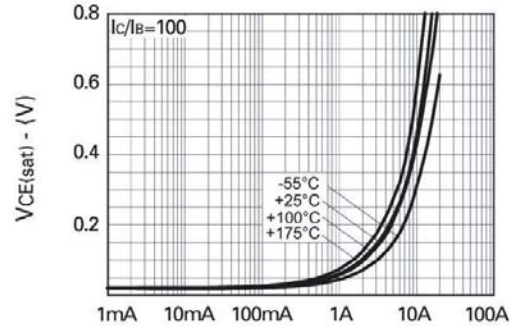
(\*) Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$



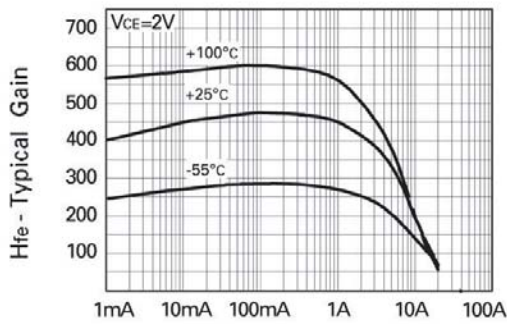
## Typical characteristics



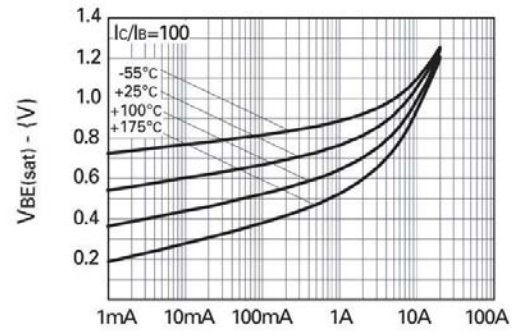
IC-Collector Current  
 **$V_{CE(sat)}$  v  $I_C$**



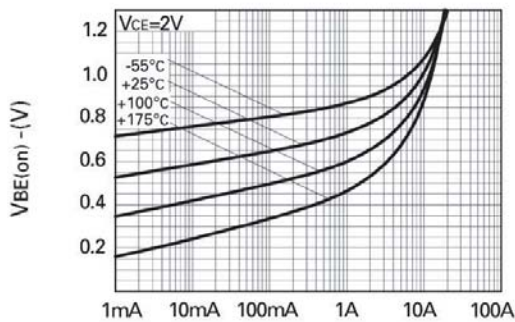
IC-Collector Current  
 **$V_{CE(sat)}$  v  $I_C$**



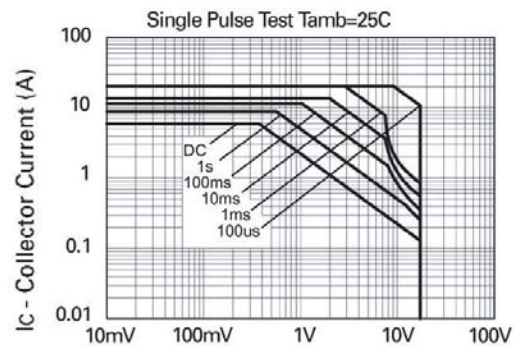
IC-Collector Current  
 **$h_{FE}$  v  $I_C$**



IC-Collector Current  
 **$V_{BE(sat)}$  v  $I_C$**

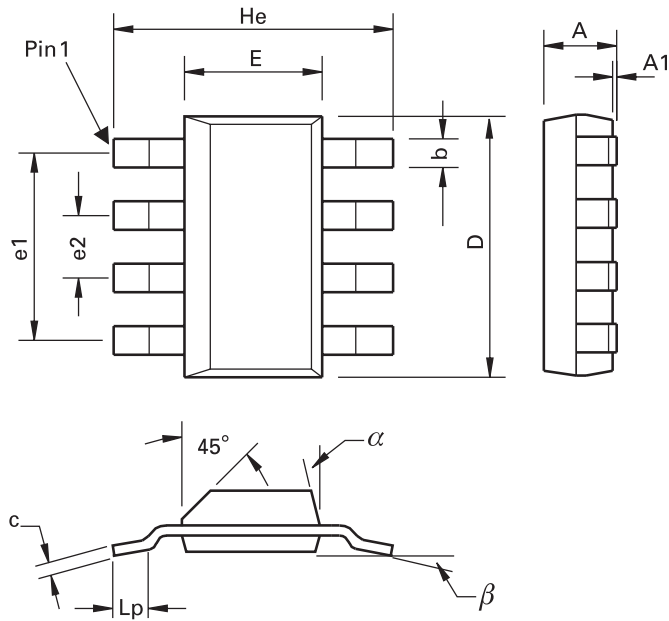


IC-Collector Current  
 **$V_{BE(on)}$  v  $I_C$**



VCE - Collector Voltage  
**Safe Operating Area**

## Package outline - SM8



DIM	Millimeters			Inches			DIM	Millimeters			Inches		
	Min.	Max.	Typ.	Min.	Max.	Typ.		Min.	Max.	Typ.	Min.	Max.	Typ.
A	-	1.7	-	-	0.067	-	e1	-	-	4.59	-	-	0.1807
A1	0.02	0.1	-	0.0008	0.004	-	e2	-	-	1.53	-	-	0.0602
b	-	-	0.7	-	-	0.0275	He	6.7	7.3	-	0.264	0.287	-
c	0.24	0.32	-	0.009	0.013	-	Lp	0.9	-	-	0.035	-	-
D	6.3	6.7	-	0.248	0.264	-	$\alpha$	-	15°	-	-	15°	-
E	3.3	3.7	-	0.130	0.145	-	$\beta$	-	-	10°	-	-	10°

**Note:** Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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