

ZDT1048

SM-8 Dual NPN medium power high gain transistors

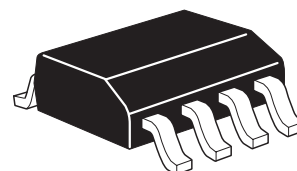
Summary

$BV_{CEO} > 17.5V$

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

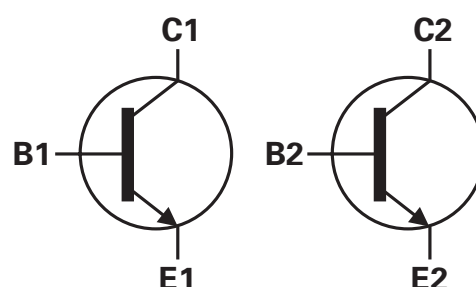
$V_{CE(sat)} < 75mV @ 1A$

$P_D = 2.75W$



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

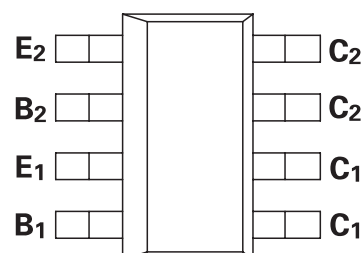
- CCFL invertors
- Royer circuits

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		18	V
Derate above 25°C^*		22	mW/°C
Any single die "on"		55.6	°C/W
Both die "on" equally		45.5	°C/W
Thermal resistance - junction to ambient*			
Any single die "on"			
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.

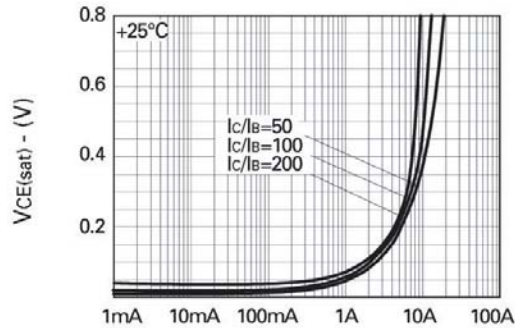
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

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	$I_C=4\text{A}$, $I_B=\pm 40\text{mA}$, $V_{CC}=10\text{V}$

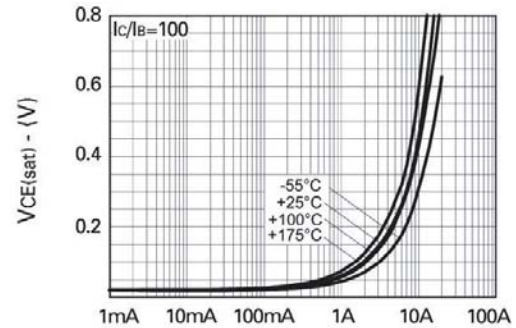
NOTES:

(*) Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

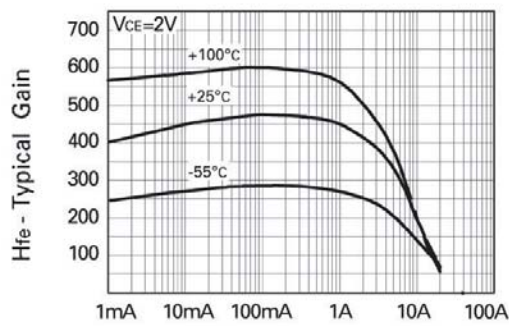
Typical characteristics



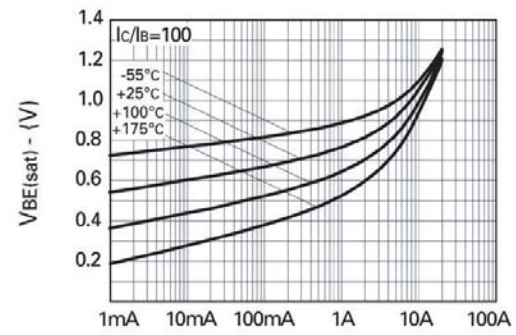
I_C -Collector Current
 $V_{CE(sat)}$ v I_C



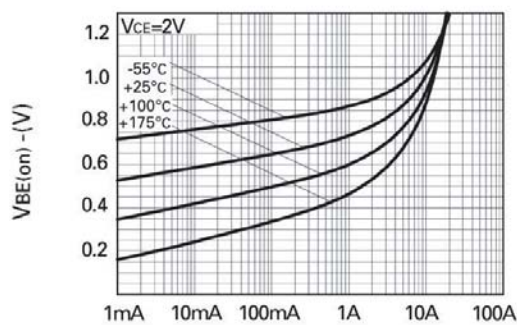
I_C -Collector Current
 $V_{CE(sat)}$ v I_C



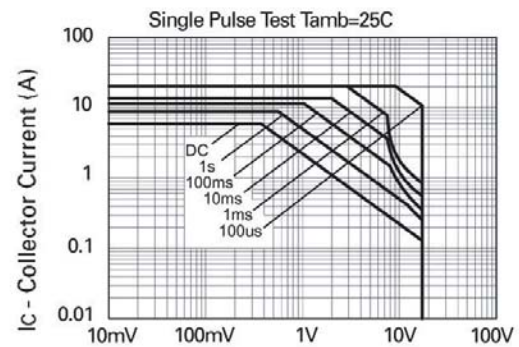
I_C -Collector Current
 h_{FE} v I_C



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

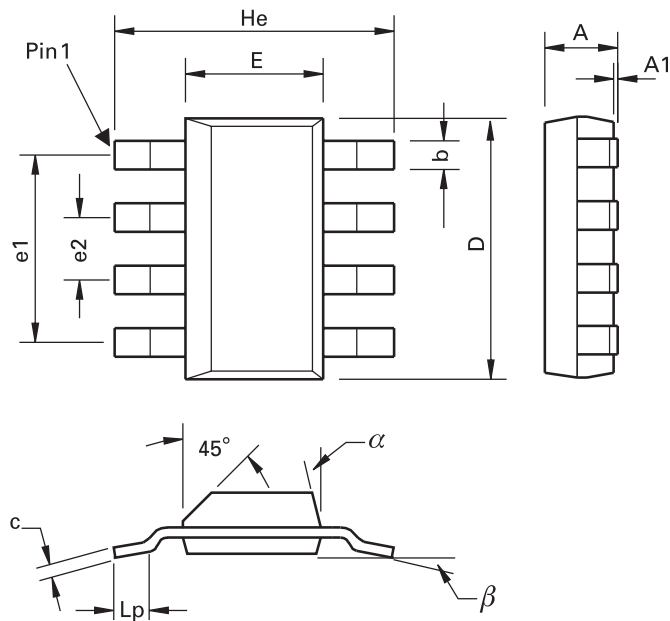


I_C -Collector Current
 $V_{BE(on)}$ v I_C



V_{CE} - 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	-	α	-	15°	-	-	15°	-
E	3.3	3.7	-	0.130	0.145	-	β	-	-	10°	-	-	10°

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

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