

FCX1051A

SOT89 NPN medium power transistor

Summary

$BV_{CEO} > 40V$

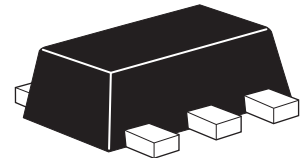
$I_{C(cont)} = 3A$

$V_{CE(sat)} < 120mV @ 1A$

$R_{CE(sat)} = 57m\Omega$

$P_D = 2W$

Complimentary type - FCX1151A

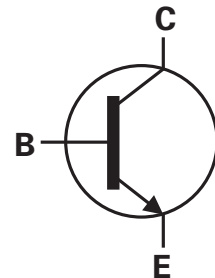


Description

An NPN low voltage, high gain bipolar transistor offering very low saturation voltage and excellent current handling in the SOT89 package.

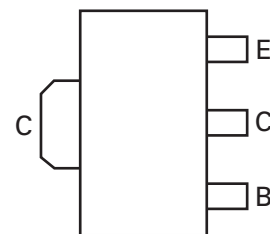
Features

- Very low saturation voltage
- High gain
- Small outline package



Applications

- Motor drive
- Strobe flash
- MOSFET and IGBT gate driving
- DC -DC converters



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX1051ATA	7	12	1,000

Device mark

051

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	150	V
Collector-emitter voltage	V_{CEO}	40	V
Emitter-base voltage	V_{EBO}	5	V
Peak pulse current ^(a)	I_{CM}	10	A
Continuous collector current	I_C	3	A
Power dissipation at $T_{amb} = 25^\circ\text{C}$	P_{tot}	1 ^(b)	W
		2 ^(c)	W
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^\circ\text{C}$

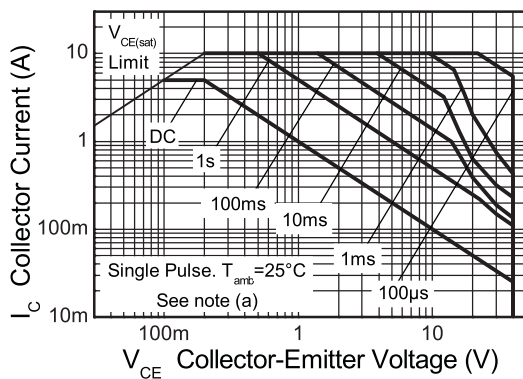
NOTES:

(a) Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$. Spice parameter data is available upon request for these devices. Refer to the handling instructions for soldering surface mount components.

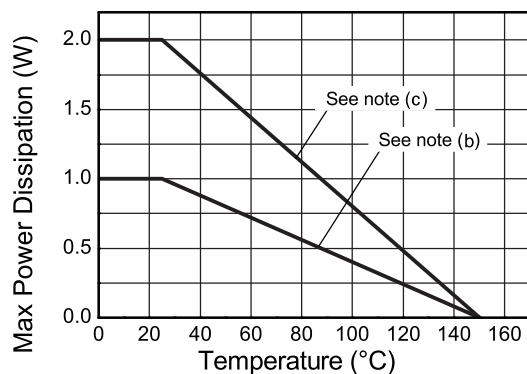
(b) Recommended P_{tot} calculated using FR4 measuring 15x15x0.6mm.

(c) Maximum power dissipation is calculated assuming that the device is mounted on FR4 substrate measuring 40x40x0.6mm and using comparable measurement methods adopted by other suppliers.

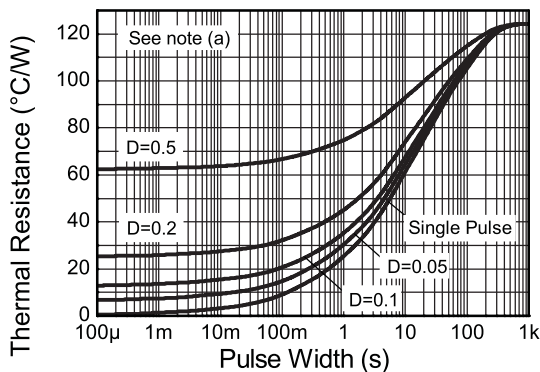
Typical characteristics



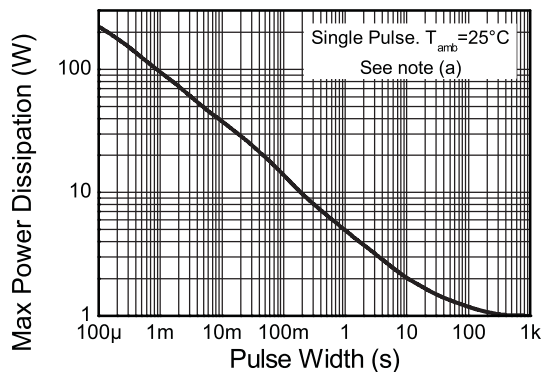
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

FCX1051A

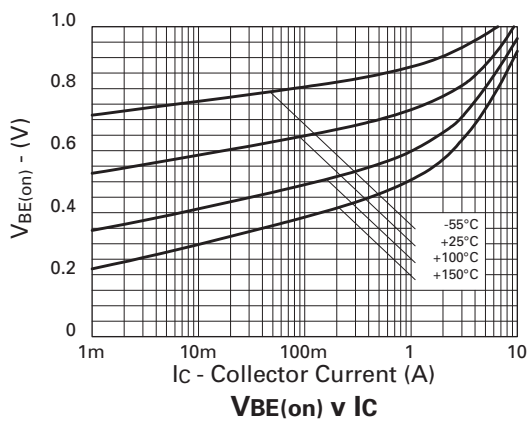
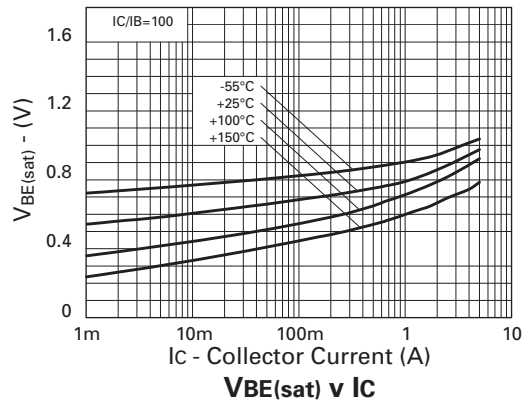
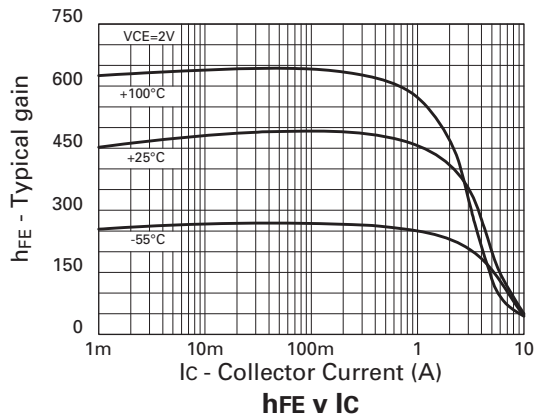
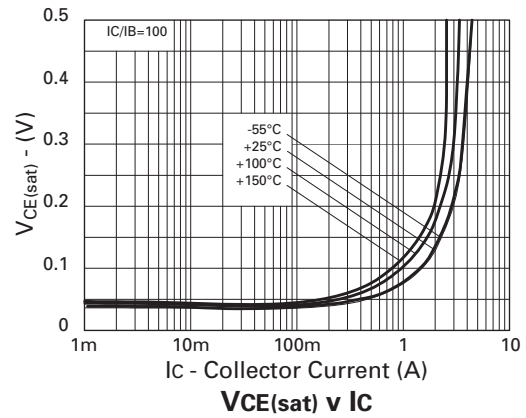
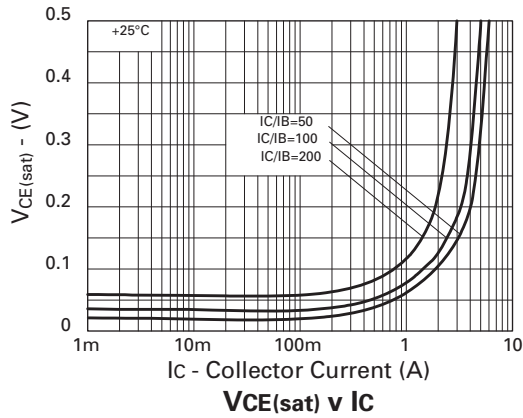
Electrical characteristics (@ $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	150			V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	V_{CES}	150			V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	V_{CEO}	40			V	$I_C = 10\text{mA}$
Collector-emitter breakdown voltage	V_{CEV}	150			V	$I_C = 100\mu\text{A}, V_{EB} = 1\text{V}$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5			V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}		0.3	10	nA	$V_{CB} = 120\text{V}$
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	$V_{CES} = 120\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		17 85 140 170 250	25 120 180 250 340	mV	$I_C = 0.2\text{A}, I_B = 10\text{mA}^{(*)}$ $I_C = 1\text{A}, I_B = 10\text{mA}^{(*)}$ $I_C = 2\text{A}, I_B = 20\text{mA}^{(*)}$ $I_C = 3\text{A}, I_B = 40\text{mA}^{(*)}$ $I_C = 5\text{A}, I_B = 100\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		880	1000	mV	$I_C = 3\text{A}, I_B = 40\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		840	950	mV	$I_C = 3\text{A}, V_{CE} = 2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	290 270 270 130 40	440 450 360 220 55	1200		$I_C = 10\text{mA}, V_{CE} = 2\text{V}^{(*)}$ $I_C = 1\text{A}, V_{CE} = 2\text{V}^{(*)}$ $I_C = 3\text{A}, V_{CE} = 2\text{V}^{(*)}$ $I_C = 5\text{A}, V_{CE} = 2\text{V}^{(*)}$ $I_C = 10\text{A}, V_{CE} = 2\text{V}^{(*)}$
Transition frequency	f_T		155		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}		27	40	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching times	t_{on} t_{off}		220 540		ns ns	$I_C = 3\text{A}, I_B = 30\text{mA}, V_{CC} = 10\text{V}$ $I_C = 3\text{A}, I_B = 30\text{mA}, V_{CC} = 10\text{V}$

NOTES:

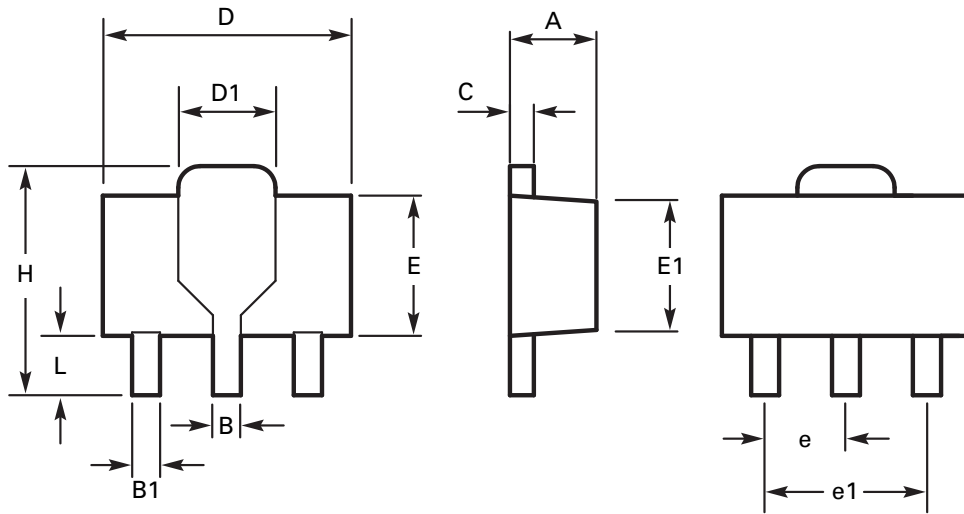
(*) Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$.

Typical characteristics



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Package outline - SOT89



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E	2.29	2.60	0.090	0.102
B	0.44	0.56	0.017	0.022	E1	2.13	2.29	0.084	0.090
B1	0.36	0.48	0.014	0.019	e	1.50 BSC		0.059 BSC	
C	0.35	0.44	0.014	0.017	e1	3.00 BSC		0.118 BSC	
D	4.40	4.60	0.173	0.181	H	3.94	4.25	0.155	0.167
D1	1.52	1.83	0.064	0.072	L	0.89	1.20	0.035	0.047

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

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