

# FCX1051A

## SOT89 NPN medium power transistor

### Summary

$BV_{CEO} > 40V$

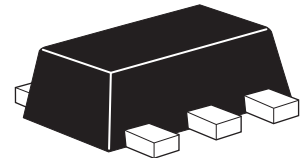
$I_{C(cont)} = 3A$

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

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

$P_D = 2W$

Complimentary type - FCX1151A

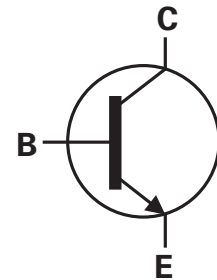


### Description

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

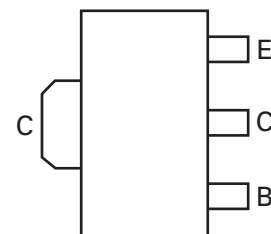
### Features

- 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 <sup>(a)</sup>	$I_{CM}$	10	A
Continuous collector current	$I_C$	3	A
Power dissipation at $T_{amb} = 25^\circ\text{C}$	$P_{tot}$	1 <sup>(b)</sup>	W
		2 <sup>(c)</sup>	W
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^\circ\text{C}$

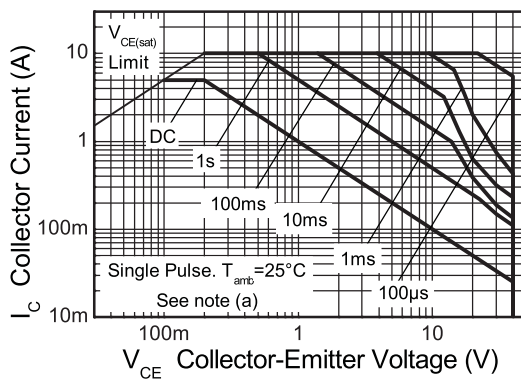
### NOTES:

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

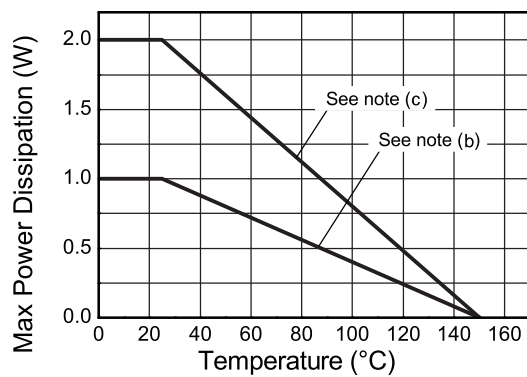
(b) Recommended  $P_{tot}$  calculated using FR4 measuring 15x15x0.6mm.

(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.

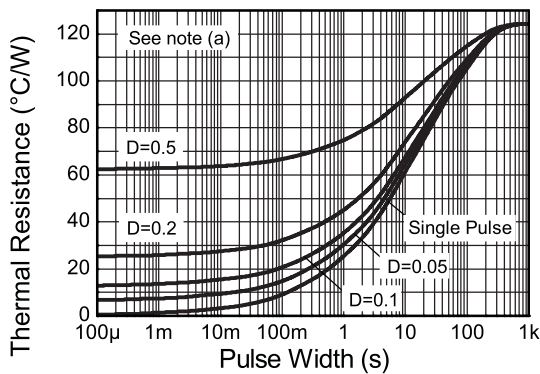
## Typical characteristics



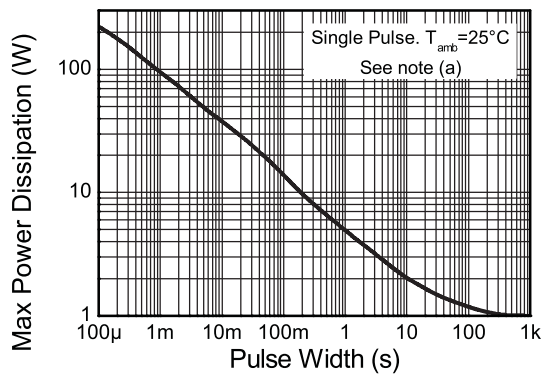
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

# FCX1051A

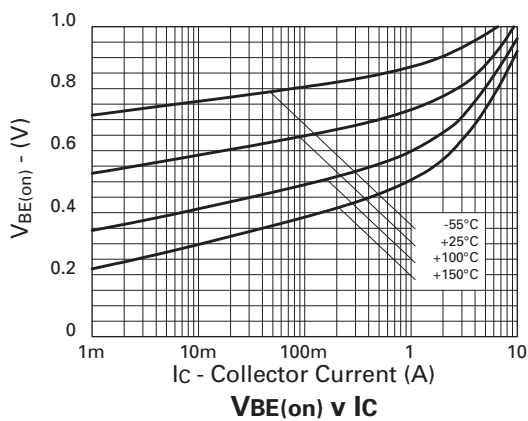
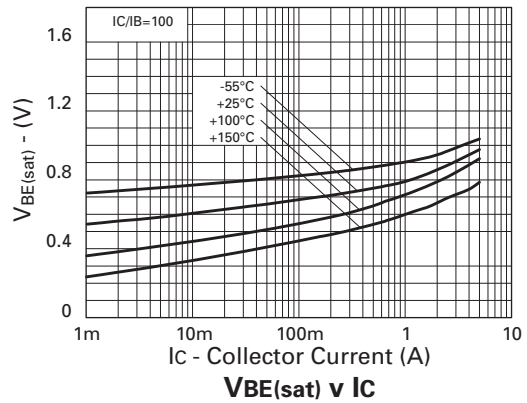
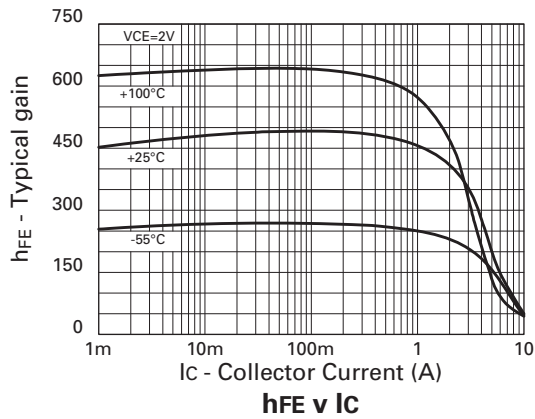
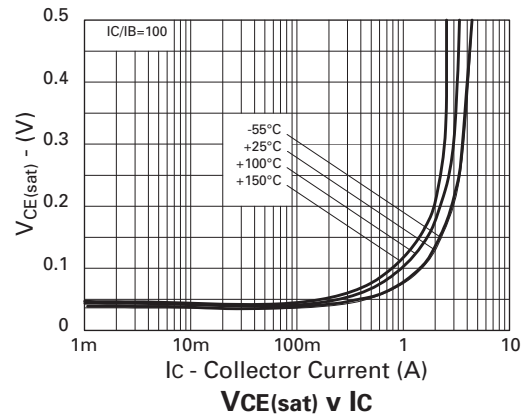
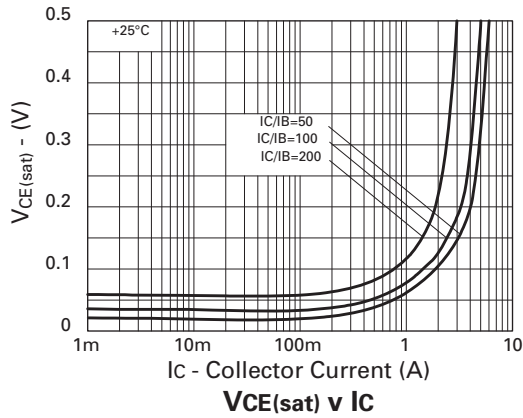
**Electrical characteristics (@  $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)**

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:**

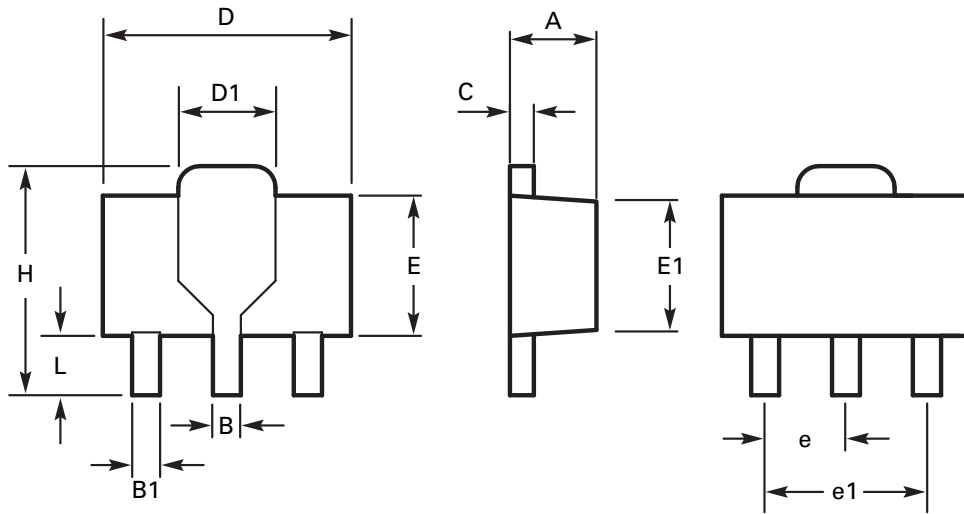
(\*) Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

## Typical characteristics



# FCX1051A

## 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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