

# FCX605U

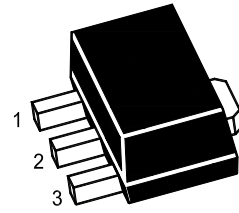
## NPN Silicon High Voltage Darlington Transistor

### Features

- Low Saturation Voltage

### Application

- Various driving functions, Lamps, Motors, Relays and solenoids
- High output current switches



1.Base 2.Collector 3.Emitter  
SOT-89 Plastic Package

### Absolute Maximum Ratings( $T_a = 25^\circ\text{C}$ unless otherwise specified)

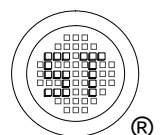
Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	140	V
Collector Emitter Voltage	$V_{CEO}$	120	V
Emitter Base Voltage	$V_{EBO}$	10	V
Collector Current	$I_C$	1	A
Peak Collector Current, Pulsed	$I_{CM}$	4	A
Power Dissipation	$P_D$	1 <sup>1)</sup> 2.8 <sup>2)</sup>	W
Operating Junction Temperature Range	$T_j$	- 55 to + 150	°C
Storage Temperature Range	$T_{stg}$	- 55 to + 150	°C

### Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	125 <sup>1)</sup> 45 <sup>2)</sup>	°C/W

<sup>1)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

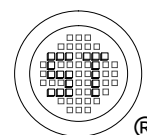
<sup>2)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.



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## Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 50\text{ mA}$ at $V_{CE} = 5\text{ V}$ , $I_C = 500\text{ mA}$ at $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ A}$ at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ A}$	$h_{FE}$ $h_{FE}$ $h_{FE}$ $h_{FE}$	2000 5000 2000 500	- - - -	- - 100000 -	- - - -
Collector Base Cutoff Current at $V_{CB} = 10\text{ V}$	$I_{CBO}$	-	-	100	nA
Emitter Base Cutoff Current at $V_{EB} = 8\text{ V}$	$I_{EBO}$	-	-	100	nA
Collector Emitter Breakdown Voltage at $I_C = 10\text{ mA}$	$V_{(BR)CEO}$	120	-	-	V
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	140	-	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	$V_{(BR)EBO}$	10	-	-	V
Collector Emitter Saturation Voltage at $I_C = 250\text{ mA}$ , $I_B = 0.25\text{ mA}$ at $I_C = 1\text{ A}$ , $I_B = 1\text{ mA}$	$V_{CE(sat)}$	- -	- -	1 1.5	V
Base Emitter Saturation Voltage at $I_C = 1\text{ A}$ , $I_B = 1\text{ mA}$	$V_{BE(sat)}$	-	-	1.8	V
Base Emitter Turn-on Voltage at $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ A}$	$V_{BE(on)}$	-	-	1.7	V
Gain Bandwidth Product at $V_{CE} = 10\text{ V}$ , $I_C = 100\text{ mA}$ , $f = 20\text{ MHz}$	$f_T$	150	-	-	MHz
Input Capacitance at $V_{CB} = 500\text{ mV}$ , $f = 1\text{ MHz}$	$C_{ibo}$	-	90	-	pF
Output Capacitance at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{obo}$	-	15	-	pF
Turn-on Time at $V_{CE} = 10\text{ V}$ , $I_C = 500\text{ mA}$ , $I_{B1} = I_{B2} = 0.5\text{ mA}$	$t_{(on)}$	-	0.5	-	$\mu\text{s}$
Turn-off Time at $V_{CE} = 10\text{ V}$ , $I_C = 500\text{ mA}$ , $I_{B1} = I_{B2} = 0.5\text{ mA}$	$t_{(off)}$	-	1.6	-	$\mu\text{s}$



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## Electrical Characteristics Curves

Fig. 1  $V_{CE(sat)}$  vs. Collector Current

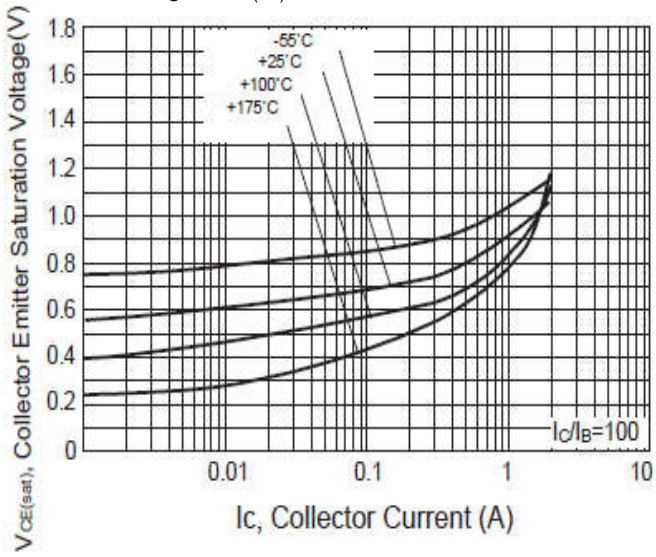


Fig. 2 DC Current Gain vs. Collector Current

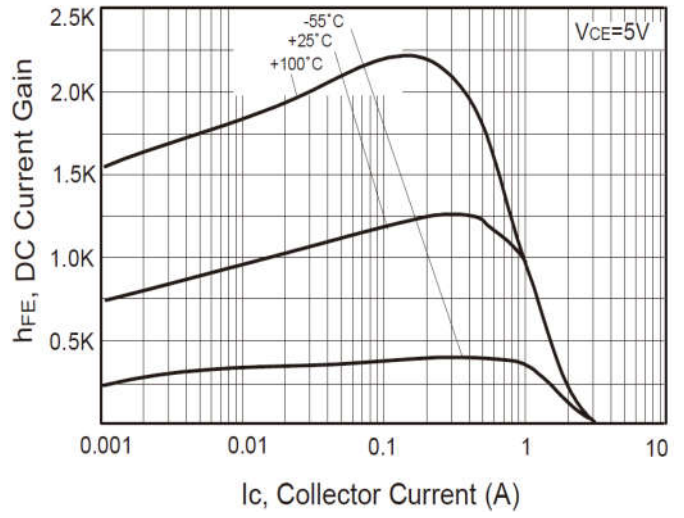


Fig. 3  $V_{BE(sat)}$  vs. Collector Current

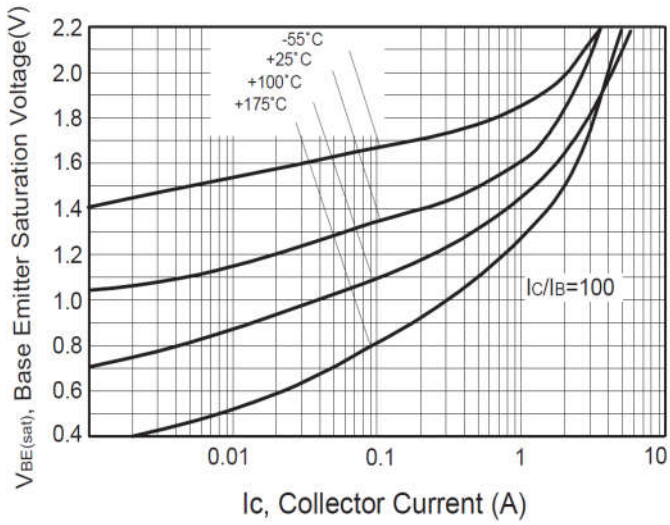
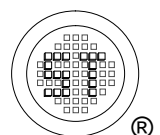
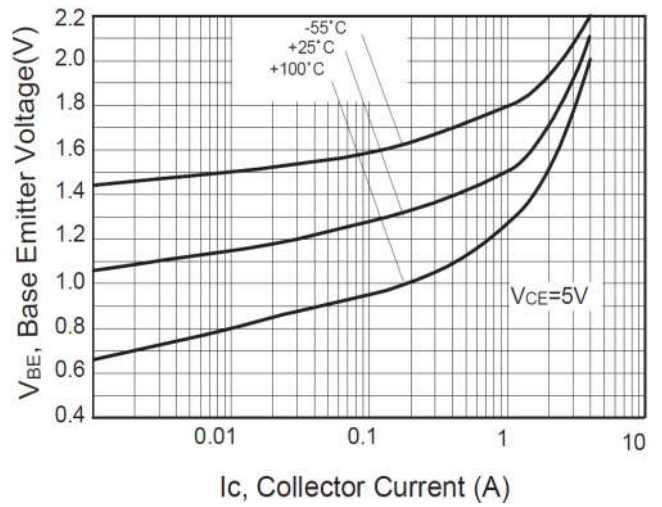


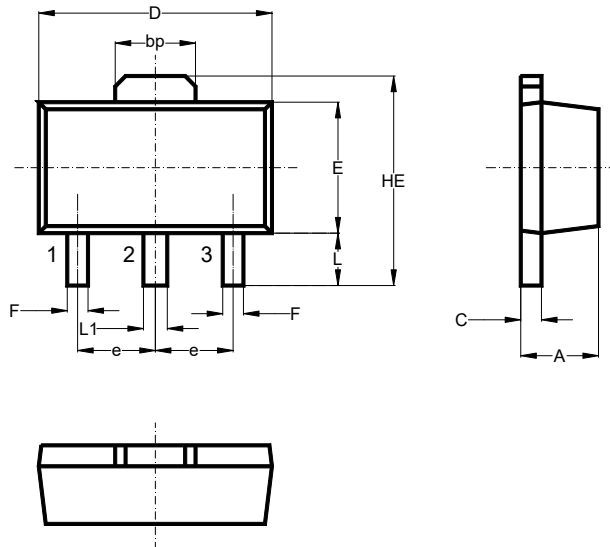
Fig. 4 Collector Current vs.  $V_{BE}$



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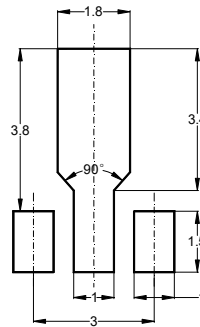
## Package Outline (Dimensions in mm)

SOT-89



Unit	A	bp	C	D	E	F	HE	e	L	L1
mm	1.6	1.60	0.5	4.6	2.6	0.45	4.25	1.5	1.05	0.51
	1.4	1.50	0.3	4.4	2.4	0.35	3.75	typ.	0.95	0.41

## Recommended Soldering Footprint

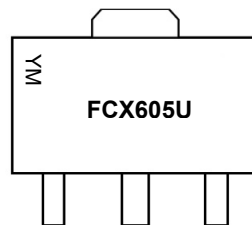


## Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-89	12	8 ± 0.1	0.315 ± 0.004	178	7	1,000
				330	13	4,000

## Marking information

- "FCX605U" = Part No.
- "YM" = Date Code Marking
- "Y" = Year
- "M" = Month
- Font type: Arial



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