Ordering number:EN5028

FX401

TR:PNP Epitaxial Planar Silicon Transistor
SBD:Schottky Barrier Diode

DC-DC Converter

Features

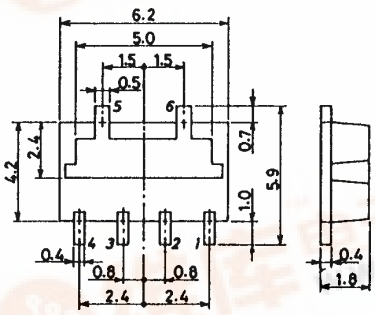
- Complex type of a low saturation voltage, high speed switching and large current PNP transistor and a fast recovery and low forward voltage Shottky barrier diode facilitating high-density mounting,
- The FX401 is composed on 2chips, one being equivalent to the 2SB1121 and the other the SB30-03P, placed in one package.

Package Dimensions

unit:mm

2123

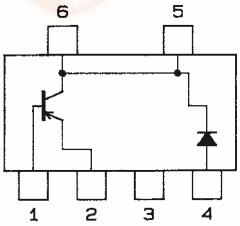
[FX401]



1:Base
2:Emitter
3:No Contact
4:Anode
5:Common
(Collector, Cathode)
6:Common
(Collector, Cathode)

SANYO:XP5
(Bottom view)

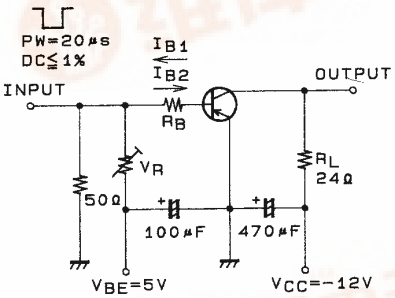
Electrical Connection



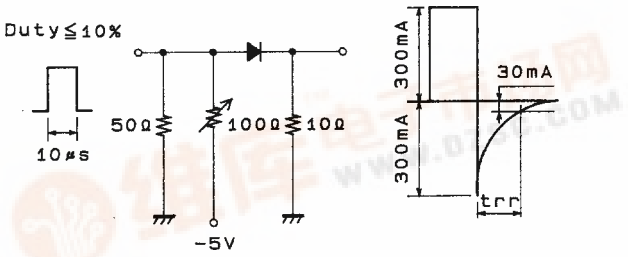
1:Base
2:Emitter
3:No Contact
4:Anode
5, 6:Common
(Collector, Cathode)

(Top view)

Switching Time Test CIrcuit



Trr Test Circuit



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V_{CBO}		–30	V
Collector-to-Emitter Voltage	V_{CEO}		–25	V
Emitter-to-Base Voltage	V_{EBO}		–6	V
Collector Current	I_C		–2	A
Collector Current (Pulse)	I_{CP}		–5	A
Base Current	I_B		–400	mA
Collector Dissipation	P_C	Mounted on ceramic board (750mm^2×0.8mm)	1.5	W
Junction Temperature	Tj		150	˚C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		30	V
Non-repetitive Peak Reverse Surge Voltage	V_{RSM}		35	V
Average Rectified Current	I_O		3	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1cycle	10	A
Junction Temperature	Tj		–55 to +125	˚C
Storage Temperature	Tstg		–55 to +125	˚C

· Marking:401

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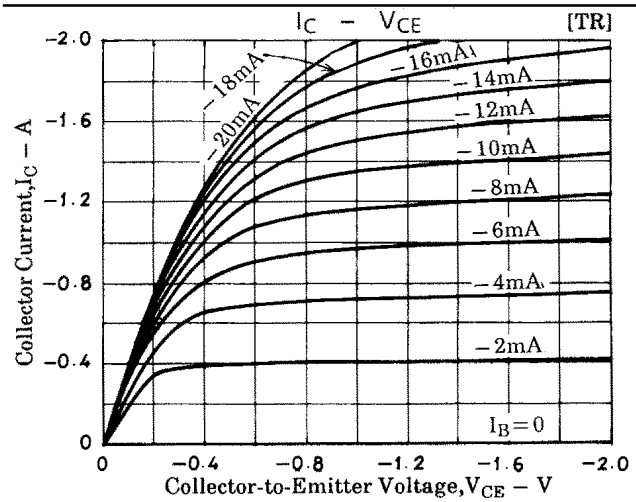
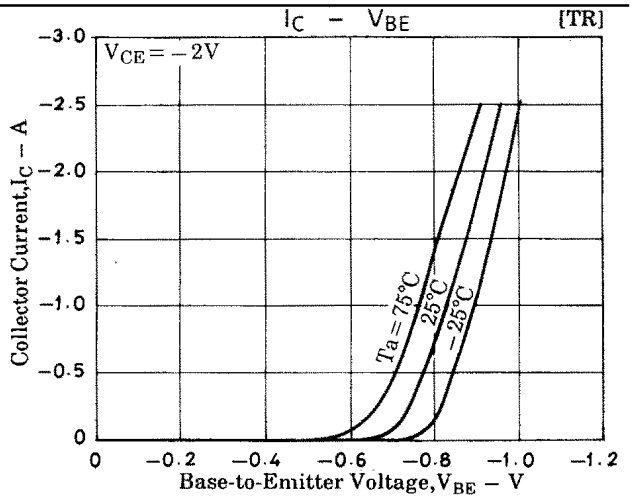
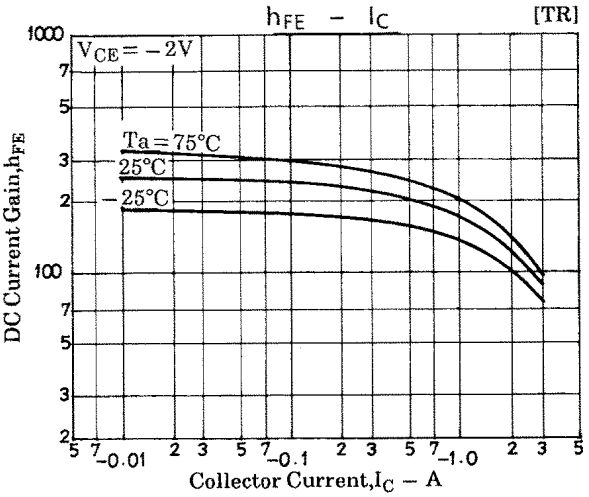
Electrical Characteristics at Ta = 25˚C

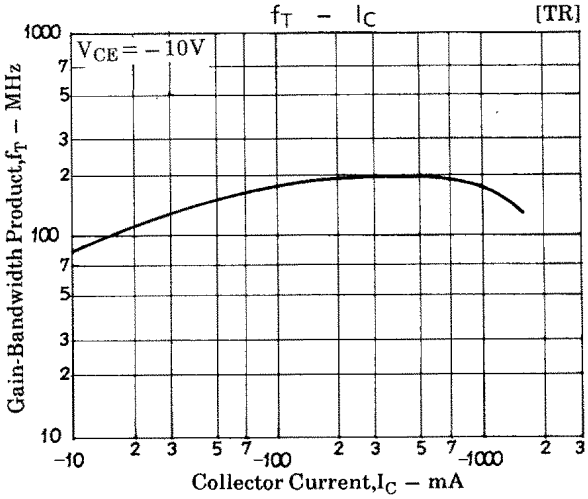
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	V_{CB}=–20V, I_E=0			–0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=–4V, I_C=0			–0.1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=–2V, I_C=–100mA	140		400	
	$h_{FE}2$	V_{CE}=–2V, I_C=–1.5A	65			
Gain-Bandwidth Product	f_T	V_{CE}=–10V, I_C=–200mA		320		MHz
Output Capacitance	Cob	V_{CE}=–10V, f=1MHz		32		pF
C-E Saturation Voltage	$V_{CE(sat)}$	I_C=–1.5A, I_B=–75mA		–350	–600	V
B-E Saturation Voltage	$V_{BE(sat)}$	I_C=–1.5A, I_B=–75mA		–1.0	–1.3	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	I_C=–10μA, I_E=0	–30			V
C-E Breakdown Voltage	$V_{(BR)CBO}$	I_C=–10μA, R_{BE}=∞	–25			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	I_E=–10μA, I_C=0	–6			V
Turn-ON Time	t_{on}	See sepcified Test Circuit		60		ns
Storage Time	tstg	See sepcified Test Circuit		350		ns
Fall Time	t_f	See sepcified Test Circuit		25		ns
[SBD] (Value per element)						
Reverse Voltage	V_R	I_R=1mA	30			V
Forward Voltage	V_F	I_F=3A			0.55	V
Reverse Current	I_R	V_R=15V			200	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz		160		pF
Reverse Recovery Time	trr	I_F=I_R=300mA, See specified Test Circuit			30	ns
Thermal Resistance	Rthj-a	Mounted on ceramic board (750mm^2×0.8mm)		85		˚C/W

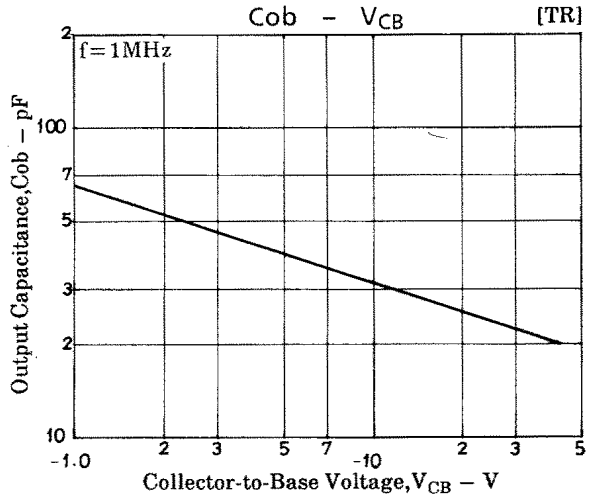
FX401

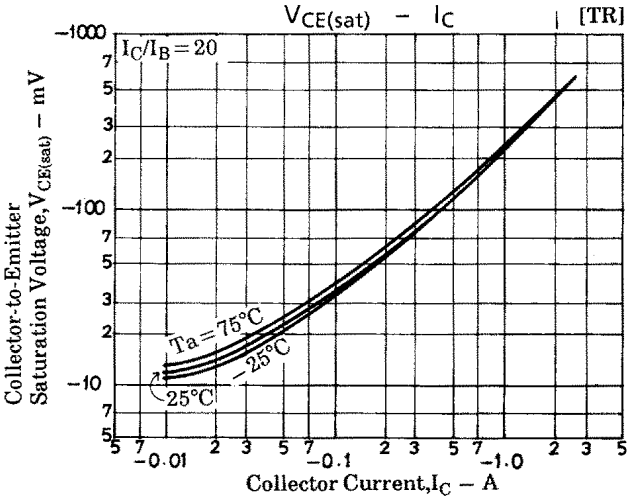

I_C – V_{CE} [TR]
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V
–18mA
–20mA
–16mA
–14mA
–12mA
–10mA
–8mA
–6mA
–4mA
–2mA
I_B = 0

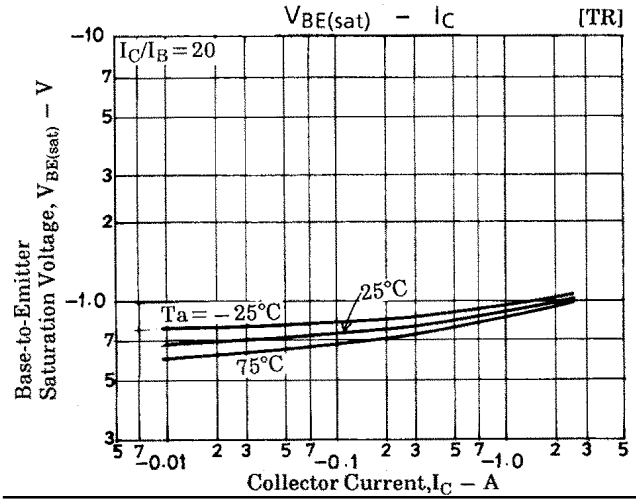

I_C – V_{BE} [TR]
V_{CE} = –2V
Collector Current, I_C – A
Base-to-Emitter Voltage, V_{BE} – V
Ta = 75°C
25°C
–25°C

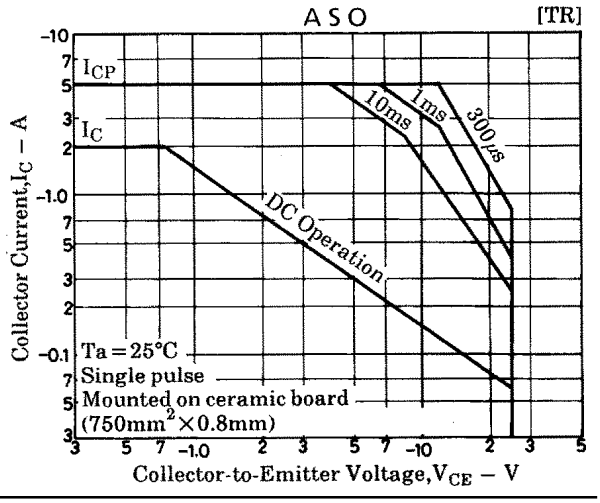

h_{FE} – I_C [TR]
V_{CE} = –2V
DC Current Gain, h_{FE}
Collector Current, I_C – A
Ta = 75°C
25°C
–25°C


f_T – I_C [TR]
V_{CE} = –10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – mA


Cob – V_{CB} [TR]
f = 1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, V_{CB} – V


$V_{CE(sat)}$ – I_C [TR]
I_C/I_B = 20
Collector-to-Emitter Saturation Voltage, $V_{CE(sat)}$ – mV
Collector Current, I_C – A
Ta = 75°C
25°C
–25°C


$V_{BE(sat)}$ – I_C [TR]
I_C/I_B = 20
Base-to-Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Collector Current, I_C – A
Ta = –25°C
25°C
75°C


ASO [TR]
I_{CP}
I_C
1ms
10ms
300μs
DC Operation
Ta = 25°C
Single pulse
Mounted on ceramic board
(750mm² × 0.8mm)
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V