

# High voltage switching transistor (400V, 2A)

## 2SC5161

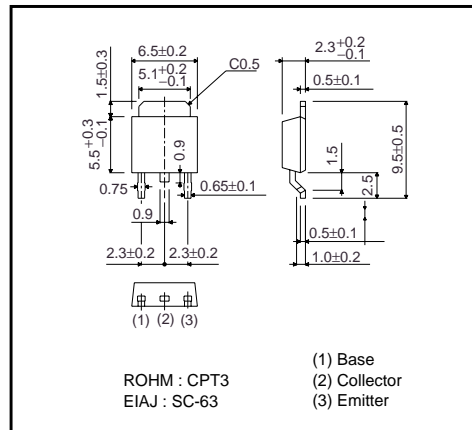
### ●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)}=0.15V$  (Typ.)  
 $(I_C/I_B=1A/0.2A)$
- 2) High breakdown voltage.  
 $V_{CEO}=400V$
- 3) Fast switching.  
 $t_r \leq 1.0\mu s$   
 $(I_C=0.8A)$

### ●Structure

Three-layer, diffused planar type  
 NPN silicon transistor

### ●External dimensions (Units : mm)



### ●Absolute maximum ratings ( $T_a=25^\circ C$ )

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	400	V
Collector-emitter voltage	$V_{CEO}$	400	V
Emitter-base voltage	$V_{EBO}$	7	V
Collector current	$I_C$	2	A(DC)
	$I_{CP}$	4	A(Pulse) *
Collector power dissipation	$P_C$	1	W
		10	W( $T_C=25^\circ C$ )
Junction temperature	$T_J$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55~+150	$^\circ C$

\* Single pulse  $P_w=10ms$

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CBO</sub>	400	–	–	V	I <sub>C</sub> =50μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	400	–	–	V	I <sub>C</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	7	–	–	V	I <sub>E</sub> =50μA
Collector cutoff current	I <sub>CBO</sub>	–	–	10	μA	V <sub>CB</sub> =400V
Emitter cutoff current	I <sub>EBO</sub>	–	–	10	μA	V <sub>EB</sub> =7V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	–	1	V	I <sub>C</sub> /I <sub>B</sub> =1A/0.2A
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	–	–	1.5	V	I <sub>C</sub> /I <sub>B</sub> =1A/0.2A
DC current transfer ratio	h <sub>FE</sub>	25	–	50	–	V <sub>CE</sub> =5V, I <sub>C</sub> =0.1A
Transition frequency	f <sub>T</sub>	–	10	–	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-0.1A, f=5MHz *1
Output capacitance	C <sub>ob</sub>	–	30	–	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz
Turn-on time	t <sub>ON</sub>	–	–	1	μs	I <sub>C</sub> =0.8A, R <sub>L</sub> =250Ω
Storage time	t <sub>stg</sub>	–	–	2.5	μs	I <sub>B1</sub> =-I <sub>B2</sub> =0.08A V <sub>CC</sub> ≒ 200V
Fall time	t <sub>f</sub>	–	–	1	μs	Refer to measurement circuit diagram

\*1 Measured using pulse current

●Packaging specifications and h<sub>FE</sub>

Type	h <sub>FE</sub>	Package name	Taping
		Code	TL
		Basic ordering unit (pieces)	2500
2SC5161	B		○

h<sub>FE</sub> values are classified as follows :

Item	B
h <sub>FE</sub>	25~50

●Electrical characteristic curves

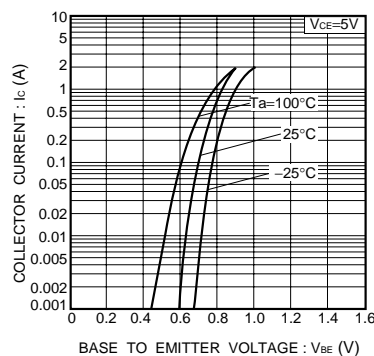


Fig.1 Grounded emitter propagation characteristics

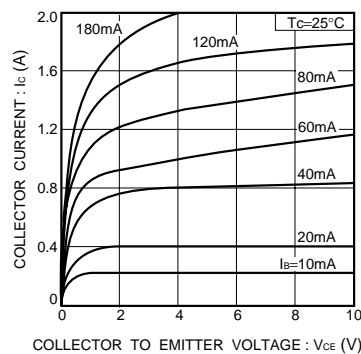


Fig.2 Grounded emitter output characteristics

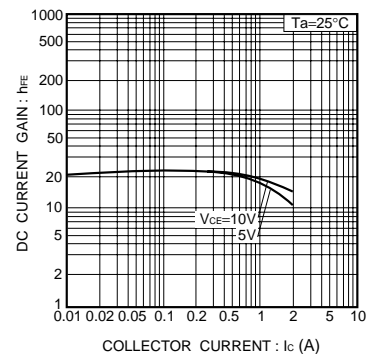


Fig.3 DC current gain vs. collector current ( I )

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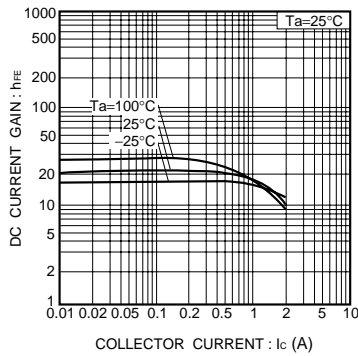


Fig.4 DC current gain vs. collector current ( II )

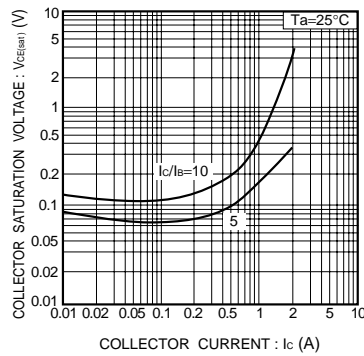


Fig.5 Collector-emitter saturation voltage vs. collector current

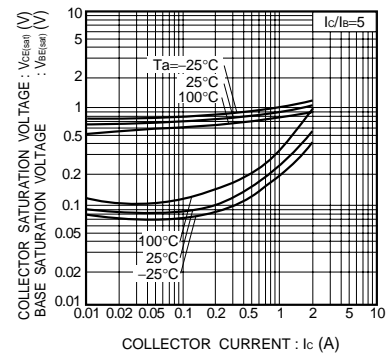


Fig.6 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

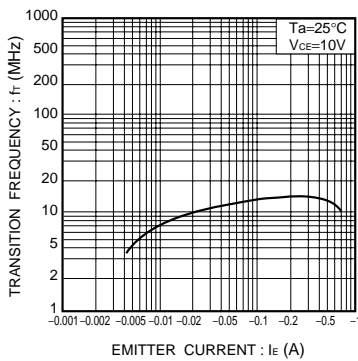


Fig.7 Gain bandwidth product vs. emitter current

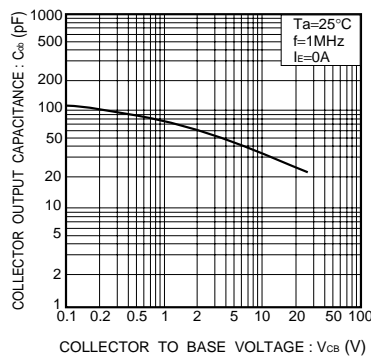


Fig.8 Collector output capacitance vs. collector-base voltage

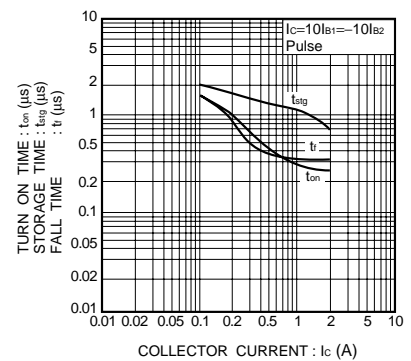
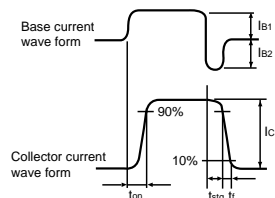
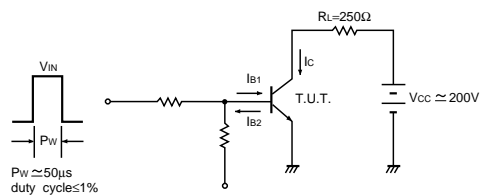


Fig.9 Switching time vs. collector current

●Switching characteristic measurement circuit



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