

# High-voltage Switching Transistor (Telephone power supply) (−400V, −0.5A)

2SA1812 / 2SA1727 / 2SA1776

## ●Features

- 1) High breakdown voltage,  $BV_{CEO} = -400V$ .
- 2) Low saturation voltage, typically  $V_{CE(sat)} = -0.3V$  at  $I_C / I_E = -100mA / -10mA$ .
- 3) High switching speed, typically  $t_f = 1 \mu s$  at  $I_C = -100mA$ .
- 4) Wide SOA (safe operating area).

## ●Packaging specifications and hFE

Type	2SA1812	2SA1727	2SA1776
Package	MPT3	CPT3	ATV
hFE	PQ	PQ	PQ
Marking	AJ*	—	—
Code	T100	TL	TV2
Basic ordering unit (pieces)	3000	3000	2500

\* Denotes hFE

## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	−400	—	—	V	$I_C = -50 \mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	−400	—	—	V	$I_C = -1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	−7	—	—	V	$I_E = -50 \mu A$
Collector cutoff current	$I_{CBO}$	—	—	−1	$\mu A$	$V_{CB} = -400V$
Emitter cutoff current	$I_{EBO}$	—	—	−1	$\mu A$	$V_{EB} = -6V$
DC current transfer ratio	hFE	82	150	270	—	$V_{CE} = -5V, I_C = -50mA$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	−1	V	$I_C / I_E = -100mA / -10mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	−1.2	V	$I_C / I_E = -100mA / -10mA$
Transition frequency	f <sub>r</sub>	—	12	—	MHz	$V_{CB} = -5V, I_E = 50mA, f = 5MHz$
Output capacitance	C <sub>ob</sub>	—	18	—	pF	$V_{CE} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	t <sub>on</sub>	—	0.6	—	$\mu s$	$I_C = -100mA, R_L = 1.5k \Omega$
Storage time	t <sub>stg</sub>	—	2.7	—	$\mu s$	$I_{B1} = -I_{B2} = -10mA$
Fall time	t <sub>f</sub>	—	1	—	$\mu s$	$V_{CC} = -150V$

## ●Absolute maximum ratings (Ta=25°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	$I_C$	−0.5	A (DC)
		−1.0	A (Pulse) *1
Collector power dissipation	P <sub>c</sub>	0.5	W
		2	W *2
		1	W
		10	W (Tc=25°C)
Junction temperature	T <sub>j</sub>	150	°C
		−55~+150	°C
Storage temperature	T <sub>stg</sub>	−55~+150	°C

\*1 Single pulse \*2 When mounted on a 40×40×0.7mm ceramic board.

\*3 When t = 1.7mm and the foil collector area on the PC board is 1cm<sup>2</sup> or greater.

(96-609-A313)

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