

# High-voltage Switching Transistor (-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  $I_C / I_B = -100mA / -10mA$ .
- 3) High switching speed, typically  $t_f : 1\mu s$  at  $I_C = -100mA$ .
- 4) Wide SOA (safe operating area).

### ●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	2SA1812	0.5	W	
			2	W *2
		2SA1727	1	W
			10	W (Tc=25°C)
2SA1776	1	W *3		
Junction temperature	$T_J$	150	°C	
Storage temperature	$T_{stg}$	-55 to +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  $1cm^2$  or greater.

### ●Packaging specifications and $h_{FE}$

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

\* Denotes  $h_{FE}$

### ●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	$I_{CBO}$	—	—	-10	$\mu A$	$V_{CB} = -400V$
Emitter cutoff current	$I_{EBO}$	—	—	-10	$\mu A$	$V_{EB} = -6V$
DC current transfer ratio	$h_{FE}$	82	150	270	—	$V_{CE} = -5V, I_C = 50mA$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	-1	V	$I_C / I_B = -100mA / -10mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	-1.2	V	$I_C / I_B = -100mA / -10mA$
Transition frequency	$f_T$	—	12	—	MHz	$V_{CB} = -5V, I_E = 50mA, f = 5MHz$
Output capacitance	$C_{ob}$	—	18	—	pF	$V_{CE} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	$t_{on}$	—	0.6	—	$\mu s$	$I_C = -100mA, R_L = 1.5k\Omega$
Storage time	$t_{stg}$	—	2.7	—	$\mu s$	$I_{B1} = -I_{B2} = -10mA$
Fall time	$t_f$	—	1	—	$\mu s$	$V_{CC} to -150V$

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