

# High-voltage Switching Transistor

## (Camera strobes and Telephone, Power supply) (−400V, −0.1A)

### 2SA1759

#### ● Features

- 1) High breakdown voltage. ( $BV_{CEO} = -400V$ )
- 2) Low saturation voltage, typically  $V_{CE(sat)} = -0.2V$  at  $I_C / I_E = -20mA / -2mA$ .
- 3) High switching speed, typically  $t_f = 1 \mu s$  at  $I_C = 100mA$ .
- 4) Wide SOA (safe operating area).
- 5) Complements the 2SA4505.

#### ● Packaging specifications and hFE

Type	2SA1759
Package	MPT3
hFE	P
Marking	AH*
Code	T100
Basic ordering unit (pieces)	3000

\* 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	$I_{CBO}$	—	—	−10	$\mu A$	$V_{CB} = -400V$
Emitter cutoff current	$I_{EBO}$	—	—	−10	$\mu A$	$V_{EB} = -6V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	−0.2	−0.5	V	$I_C / I_E = -20mA / -2mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	−1.2	V	$I_C / I_E = -20mA / -2mA$
DC current transfer ratio	hFE	82	—	180	—	$V_{CE} = -10V, I_C = -10mA$
Transition frequency	fT	—	12	—	MHz	$V_{CE} = -10V, I_E = 10mA, f = 5MHz$
Output capacitance	Cob	—	13	—	pF	$V_{CB} = -10V, I_E = 0A, f = 1MHz$
Turn-on time	t <sub>on</sub>	—	0.7	—	$\mu s$	$I_C = -100mA, R_L = 1.5k\Omega$
Storage time	t <sub>stg</sub>	—	1.8	—	$\mu s$	$I_{B1} = -I_{B2} = -10mA$
Fall time	t <sub>f</sub>	—	1	—	$\mu s$	$V_{CC} \sim -150V$

(96-97-A324)

# Power Transistor (400V, 0.1A)

## 2SC4505 / 2SC4620

#### ● Features

- 1) High breakdown voltage. ( $BV_{CEO} = 400V$ )
- 2) Low saturation voltage, typically  $V_{CE(sat)} = 0.05V$  at  $I_C / I_E = 10mA / 1mA$ .
- 3) High switching speed, typically  $t_f = 1.7 \mu s$  at  $I_C = 100mA$ .
- 4) Complements the 2SC4505 and the 2SA1759.

#### ● Packaging specifications and hFE

Type	2SC4505	2SC4620
Package	MPT3	ATV
hFE	PQ	Q
Marking	CE*	—
Code	T100	TV2
Basic ordering unit (pieces)	1000	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	$I_{CBO}$	—	—	10	$\mu A$	$V_{CB} = 400V$
Emitter cutoff current	$I_{EBO}$	—	—	10	$\mu A$	$V_{EB} = 6V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	0.05	0.5	V	$I_C = 10mA, I_E = 1mA$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	1.5	V	$I_C = 10mA, I_E = 1mA$
DC current transfer ratio	hFE	82	—	270	—	$V_{CE} / I_C = 10V / 10mA$
Transition frequency	fT	—	20	—	MHz	$V_{CE} = 10V, I_E = -10mA, f = 10MHz$
Output capacitance	Cob	—	7	—	pF	$V_{CB} = 10V, I_E = 0A, f = 1MHz$
Turn-on time	t <sub>on</sub>	—	1	—	$\mu s$	$I_C = 100mA$
Storage time	t <sub>stg</sub>	—	5.5	—	$\mu s$	$I_{B1} = -I_{B2} = 10mA$
Fall time	t <sub>f</sub>	—	1.7	—	$\mu s$	$V_{CC} \sim -150V$

(96-178-C300)

#### ● 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	$I_C$	−0.1	A (DC)
		−0.2	A (Pulse) *1
Collector power dissipation	$P_C$	0.5	W
		2 *2	
Junction temperature	Tj	150	°C
Storage temperature	Tstg	−55~+150	°C

\*1 Single pulse, Pw=100ms

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

#### ● 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	$I_C$	0.1	A
		0.2	A *
Collector power dissipation	$P_C$	0.5	W
		1	
Junction temperature	Tj	150	°C
Storage temperature	Tstg	−55~+150	°C

\* Single pulse Pw=20ms Duty=1 / 2