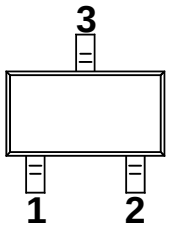
Medium Power Transistor (32V, 0.8A)

SOT–23 (TO–236AB)



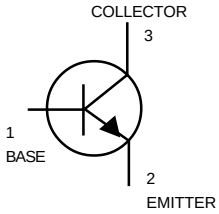
●Features

1) Very low $V_{CE(sat)}$.
   $V_{CE(sat)}$ < 0.4 V (Typ.)
   (I_C / I_B = 500mA / 50mA)
2) High current capacity in compact package.
3) Complements the 2SB1197K
4) Pb Free Package is Available.

●Structure

Epitaxial planar type

NPN silicon transistor



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	40	V
Collector-emitter voltage	V_{CEO}	32	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	0.8	A(DC)
		1.5	A(Pulse) ∗
Collector power dissipation	P_C	200	mW
Junction temperature	Tj	150	℃
Storage temperature	Tstg	−55～+150	℃

∗ Single pulse Pw=100ms

ORDERING INFORMATION

Device	Marking	Shipping
2SD1781KQ	AFQ	3000/Tape&Reel
2SD1781KR	AFR	

●h_{FE} values are classified as follows:

Item	Q	R
h_{FE}	120~270	180~390

DEVICE CHARACTERISTICS

2SD1781KQ/R

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	40	—	—	V	I_C=50 μA
Collector-emitter breakdown voltage	BV_{CEO}	32	—	—	V	I_C=1mA
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	I_E=50 μA
Collector cutoff current	I_{CBO}	—	—	0.5	μA	V_{CB}=20V
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	V_{EB}=4V
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	0.4	V	I_C/I_B=500mA/50mA
DC current transfer ratio	h_{FE}	120	—	390	—	V_{CE}=3V, I_C=100mA
Transition frequency	f_T	—	150	—	MHz	V_{CE}=5V, I_E=−50mA, f=100MHz
Output capacitance	Cob	—	10	—	pF	V_{CB}=10V, I_E=0A, f=1MHz

●Electrical characteristic curves

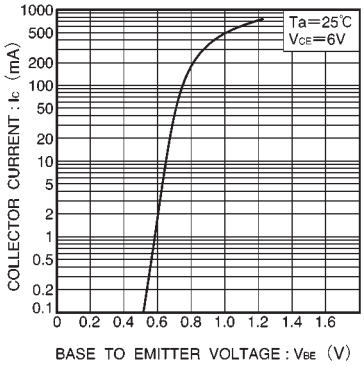


Fig.1 Grounded emitter propagation characteristics

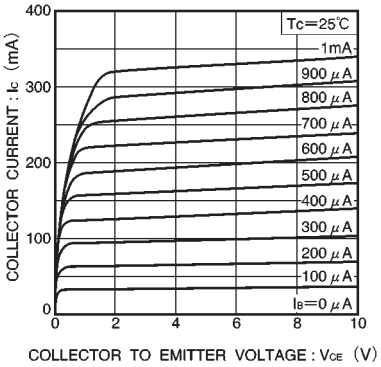


Fig.2 Grounded emitter output characteristics

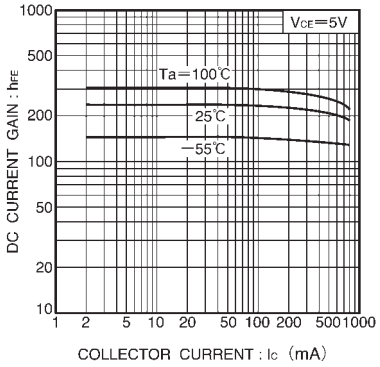


Fig.3 DC current gain vs. collector current

DEVICE CHARACTERISTICS

2SD1781KQ/R

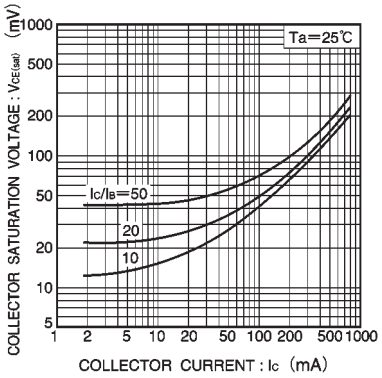


Fig.4 Collector-emitter saturation voltage vs. collector current (Ⅰ)

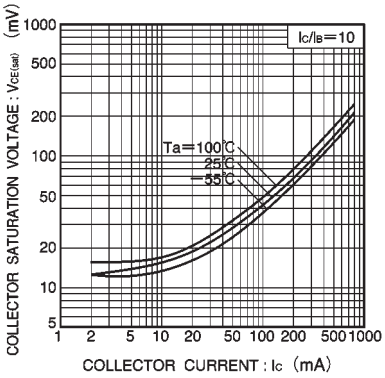


Fig.5 Collector-emitter saturation voltage vs. collector current (Ⅱ)

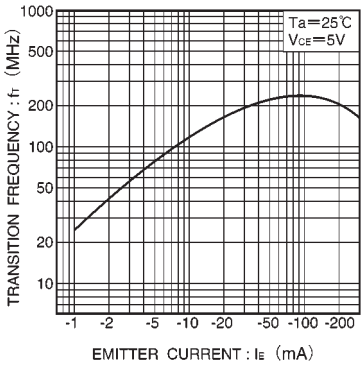


Fig.6 Gain bandwidth product vs. emitter current

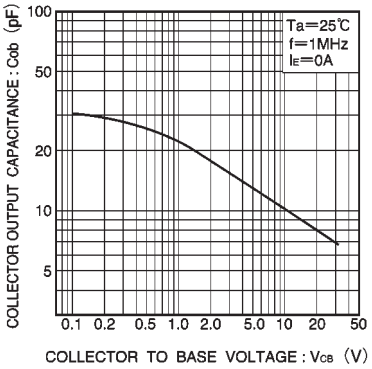


Fig.7 Collector output capacitance vs. collector-base voltage

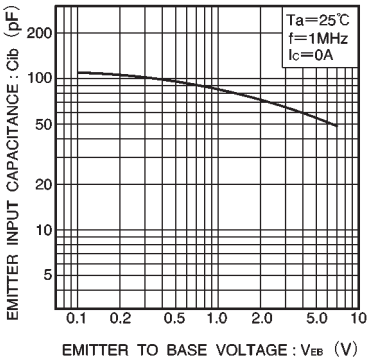
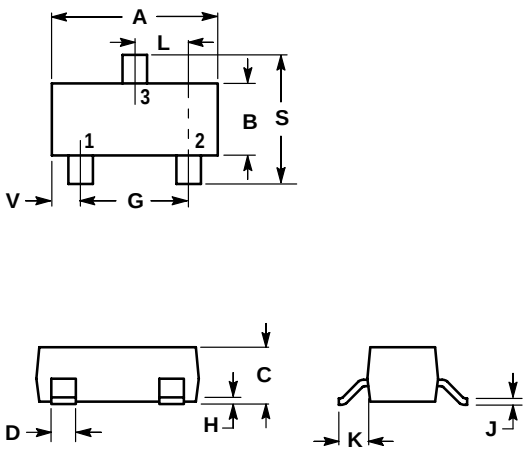


Fig.8 Emitter input capacitance vs. emitter-base voltage

PACKAGE OUTLINE AND DIMENSIONS

2SD1781KQ/R

SOT–23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60