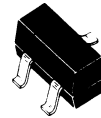


MMBR901

Die Source Same as MRF901

RF AMPLIFIER TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	15	Vdc
Collector-Base Voltage	V_{CBO}	25	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	30	mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

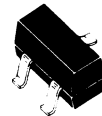
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_B = 0$)	$V_{(BR)CEO}$	15	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1$ mAdc, $I_E = 0$)	$V_{(BR)CBO}$	25	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1$ mAdc, $I_C = 0$)	$V_{(BR)EBO}$	2.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 15$ Vdc, $I_E = 0$)	I_{CBO}	—	50	nAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 5.0$ mAdc, $V_{CE} = 5.0$ Vdc)	h_{FE}	30	200	—
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance ($V_{CB} = 10$ Vdc, $I_E = 0$, $f = 1.0$ MHz)	C_{obo}	—	1.0	pF
Common-Emitter Amplifier Power Gain ($V_{CC} = 6.0$ Vdc, $I_C = 5.0$ mAdc, $f = 1.0$ GHz)	$G_{pe(1)}$	16 (Typ)	—	dB
Noise Figure ($I_C = 5.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 1.0$ GHz)	$NF(1)$	—	1.9 (Typ)	dB

(1) Noise figure and power gain measured on the Ailtech 7380 50Ω system.

MMBR920

**RF AMPLIFIER/SWITCHING
TRANSISTOR**
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	15	V _{dc}
Collector-Base Voltage	V _{CBO}	20	V _{dc}
Emitter-Base Voltage	V _{EBO}	3.0	V _{dc}
Collector Current — Continuous	I _C	35	mAdc
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, T _A = 25°C Derate above 25°C	P _D	350 2.8	mW mW/°C
Storage Temperature	T _{stg}	150	°C
*Thermal Resistance Junction to Ambient	R _{θJA}	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

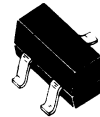
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 1.0 mAdc, I _B = 0)	V _{(BR)CEO}	15	—	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 0.1 mAdc, I _E = 0)	V _{(BR)CBO}	20	—	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 0.1 mAdc, I _C = 0)	V _{(BR)EBO}	2.0	—	—	V _{dc}
Collector Cutoff Current (V _{CB} = 10 Vdc, I _E = 0)	I _{CBO}	—	—	50	nAdc
ON CHARACTERISTICS					
DC Current Gain (I _C = 14 mAdc, V _{CE} = 10 Vdc)	h _{FE}	25	—	250	—
SMALL SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I _C = 14 mAdc, V _{CE} = 10 Vdc, f = 0.5 GHz)	f _T	—	4.5	—	GHz
Collector-Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{cb}	—	—	1.0	pF
Noise Figure (I _C = 2.0 mAdc, V _{CE} = 10 Vdc, f = 0.5 GHz) (I _C = 2.0 mAdc, V _{CE} = 10 Vdc, f = 1.0 GHz)	NF(1)	—	2.4 3.0	—	dB
Common-Emitter Amplifier Power Gain (I _C = 2.0 mAdc, V _{CE} = 10 Vdc, f = 0.5 GHz) (I _C = 2.0 mAdc, V _{CE} = 10 Vdc, f = 1.0 GHz)	G _{pe} (1)	—	15 10	—	dB

(1) Noise figure and power gain measured on the Ailtech 7380 50 Ω system.

MMBR930

**AMPLIFIER/SWITCHING
TRANSISTOR**
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	12	Vdc
Collector-Base Voltage	V_{CBO}	15	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	35	mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_E = 0$)	$V_{(BR)CEO}$	12	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1$ mAdc, $I_E = 0$)	$V_{(BR)CBO}$	15	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1$ mAdc, $I_C = 0$)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 5.0$ Vdc, $I_E = 0$)	I_{CBO}	—	—	50	nAdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 30$ mAdc, $V_{CE} = 5.0$ Vdc)	h_{FE}	25	—	250	—
SMALL-SIGNAL CHARACTERISTICS					
Collector-Base Capacitance ($V_{CB} = 10$ Vdc, $I_E = 0$, $f = 1.0$ MHz)	C_{cb}	—	—	1.0	pF
Noise Figure ($I_C = 2.0$ mAdc, $V_{CE} = 5.0$ Vdc, $f = 0.5$ GHz) ($I_C = 2.0$ mAdc, $V_{CE} = 5.0$ Vdc, $f = 1.0$ GHz)	$NF(1)$	—	1.9 2.5	—	dB
Common-Emitter Amplifier Power Gain ($I_C = 2.0$ mAdc, $V_{CE} = 5.0$ Vdc, $f = 0.5$ GHz) ($I_C = 2.0$ mAdc, $V_{CE} = 5.0$ Vdc, $f = 0.5$ GHz)	$G_{pe}(1)$	—	11 8.0	—	dB

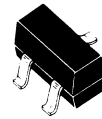
(1) Noise figure and power gain measured on the Ailtech 7380 50 Ω system.

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MMBR931

Die Source Same as MRF931

RF AMPLIFIER TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	5.0	V _d c
Collector-Base Voltage	V _{CBO}	10	V _d c
Emitter-Base Voltage	V _{EBO}	2.0	V _d c
Collector Current — Continuous	I _C	5.0	mA _d c
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, T _A = 25°C Derate above 25°C	P _D	350 2.8	mW mW/°C
Storage Temperature	T _{stg}	150	°C
*Thermal Resistance Junction to Ambient	R _{θJA}	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

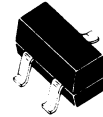
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 0.1 mA _d c, I _B = 0)	V _{(BR)CEO}	5.0	—	—	V _d c
Collector-Base Breakdown Voltage (I _C = 0.01 mA _d c, I _E = 0)	V _{(BR)CBO}	10	—	—	V _d c
Emitter-Base Breakdown Voltage (I _E = 0.1 mA _d c, I _C = 0)	V _{(BR)EBO}	2.0	—	—	V _d c
Collector Cutoff Current (V _{CB} = 5.0 V _d c, I _E = 0)	I _{CBO}	—	—	50	nA _d c
ON CHARACTERISTICS					
DC Current Gain (I _C = 0.25 mA _d c, V _{CE} = 1.0 V _d c)	h _{FE}	30	—	150	—
SMALL-SIGNAL CHARACTERISTICS					
Collector-Base Capacitance (V _{CB} = 1.0 V _d c, I _E = 0, f = 1.0 MHz)	C _{cb}	—	—	0.5	pF
Noise Figure (I _E = 0.25 mA _d c, V _{CE} = 1.0 V _d c, f = 1.0 GHz)	NF(1)	—	4.3	—	dB
Gate Power Dissipation (I _E = 0.25 mA _d c, V _{CE} = 1.0 V _d c, f = 1.0 GHz)	PG(1)	—	10	—	—

(1) Noise figure and power gain measured on the Ailtech 7380 50 Ω system.

MMBR2060

RF AMPLIFIER TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	14	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	50	mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

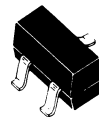
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_B = 0$)	$V_{(BR)CEO}$	14	—	Vdc
Collector Cutoff Current ($V_{CB} = 10$ Vdc, $I_E = 0$)	I_{CBO}	—	50	nAdc
Emitter Cutoff Current ($V_{EB} = 4.0$, $I_C = 0$)	I_{EBO}	—	100	μ Adc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 5.0$ mAdc, $V_{CE} = 5.0$ Vdc) ($I_C = 20$ mAdc, $V_{CE} = 10$ Vdc, $f = 500$ MHz)	h_{FE}	20 2.0	—	—
Collector-Emitter Saturation Voltage ($I_C = 80$ mAdc, $I_B = 8.0$ mAdc)	$V_{CE(sat)}$	—	0.38	Vdc
Base-Emitter Saturation Voltage ($I_C = 40$ mAdc, $I_B = 20$ mAdc)	$V_{BE(sat)}$	—	0.98	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($I_C = 20$ mAdc, $V_{CE} = 1.0$ Vdc, $f = 100$ MHz)	f_T	—	1.0	GHz
Collector-Base Capacitance ($V_{CB} = 10$ Vdc, $I_E = 0$)	C_{cb}	—	1.0	pF
Emitter-Base Capacitance ($V_{EB} = 0.5$ Vdc, $I_C = 0$)	C_{eb}	—	3.0	pF
Noise Figure ($V_{CE} = 10$ Vdc, $I_E = 1.5$ mAdc, $f = 450$ MHz)	NF(1)	—	3.5	dB
Common-Emitter Amplifier Power Gain ($V_{CE} = 10$ Vdc, $I_E = 1.5$ mAdc, $f = 450$ MHz)	$G_{pe(1)}$	12.5	—	dB

(1) Noise figure and power gain measured on the Ailtech 7380 50 Ω system.

MMBR2857

Die Source Same as 2N2857

RF TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	15	Vdc
Collector-Base Voltage	V _{CBO}	30	Vdc
Emitter-Base Voltage	V _{EBO}	2.5	Vdc
Collector Current — Continuous	I _C	40	mAdc
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, T _A = 25°C Derate above 25°C	P _D	350 2.8	mW mW/°C
Storage Temperature	T _{stg}	150	°C
*Thermal Resistance Junction to Ambient	R _{θJA}	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I _C = 3.0 mAdc, I _B = 0)	V _{(BR)CEO}	15	—	Vdc
Collector-Base Breakdown Voltage (I _C = 1.0 μAdc, I _E = 0)	V _{(BR)CBO}	30	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	V _{(BR)EBO}	2.5	—	Vdc
Collector Cutoff Current (V _{CB} = 15 Vdc, I _E = 0)	I _{CBO}	—	0.05	μAdc
ON CHARACTERISTICS				
DC Current Gain (I _C = 3.0 mAdc, V _{CE} = 1.0 Vdc)	h _{FE}	30	—	—
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product (I _C = 4.0 mAdc, V _{CE} = 10 Vdc, f = 100 MHz)	f _T	1000	—	MHz
Collector-Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 0.1 MHz)	C _{cb}	—	1.0	pF
Small-Signal Current Gain (I _C = 2.0 mAdc, V _{CE} = 6.0 Vdc, f = 1.0 kHz)	h _{fe}	50	—	—
Noise Figure (I _C = 1.5 mAdc, V _{CE} = 6.0 Vdc, R _S = 50 Ω, f = 450 MHz)	NF	—	4.5	dB
Common-Emitter Amplifier Power Gain (I _C = 1.5 mAdc, V _{CE} = 6.0 Vdc, f = 450 MHz)	G _{pE}	12.5	—	dB

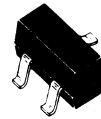
3

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MMBR4957

Die Source Same as 2N4957

RF AMPLIFIER TRANSISTOR
PNP SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	30	Vdc
Collector-Base Voltage	V _{CBO}	30	Vdc
Emitter-Base Voltage	V _{EBO}	3.0	Vdc
Collector Current — Continuous	I _C	30	mA _{dc}
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, T _A = 25°C Derate above 25°C	P _D	350 2.8	mW mW/°C
Storage Temperature	T _{stg}	150	°C
*Thermal Resistance Junction to Ambient	R _{θJA}	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

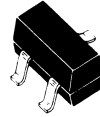
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I _C = 1.0 mA _{dc} , I _B = 0)	V _{(BR)CEO}	30	—	Vdc
Collector-Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0)	V _{(BR)CBO}	30	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C = 0)	V _{(BR)EBO}	3.0	—	Vdc
Collector Cutoff Current (V _{CB} = 10 Vdc, I _C = 0)	I _{CBO}	—	0.1	μA _{dc}
ON CHARACTERISTICS				
DC Current Gain (I _C = 2.0 mA _{dc} , V _{CE} = 10 Vdc)	h _{FE}	20	150	—
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product (I _E = 2.0 mA _{dc} , V _{CE} = 10 Vdc, f = 100 MHz)	f _T	1,200	—	MHz
Collector-Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{cb}	—	0.8	pF
Common-Emitter Amplifier Power Gain(1) (V _{CE} = 10 Vdc, I _C = 2.0 mA _{dc} , f = 450 MHz)	G _{pe}	17 (Typ)	—	dB
Noise Figure(1) (I _C = 2.0 mA _{dc} , V _{CE} = 10 Vdc, f = 450 MHz)	NF	—	3.0 (Typ)	dB

(1) Noise figure and power gain measured on the Aiitech 7380 50 Ω system.

MMBR5031

Die Source Same as 2N5031

RF AMPLIFIER TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	10	Vdc
Collector-Base Voltage	V_{CBO}	15	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	20	mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_E = 0$)	$V_{(BR)CEO}$	10	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.01$ mAdc, $I_E = 0$)	$V_{(BR)CBO}$	15	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.01$ mAdc, $I_C = 0$)	$V_{(BR)EBO}$	3.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 6.0$ Vdc, $I_E = 0$)	I_{CBO}	—	10	nAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc)	h_{FE}	25	300	—
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($I_C = 5.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 100$ MHz)	f_T	1,000	—	MHz
Collector-Base Capacitance ($V_{CE} = 6.0$ Vdc, $I_E = 0$, $f = 0.1$ MHz)	C_{cb}	—	1.5	pF
Noise Figure ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 450$ MHz)	NF(1)	—	2.5	dB
Common-Emitter Amplifier Power Gain ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 450$ MHz)	$G_{pe}(1)$	14	25	dB

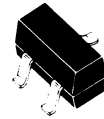
(1) Noise figure and power gain measure on Ailtech 7380 50 Ω system.

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MMBR5179

Die Source Same as 2N5179

RF AMPLIFIER TRANSISTOR
NPN SILICON



CASE 318-02/03, STYLE 6
SOT-23
(TO-236AA/AB)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	12	Vdc
Collector-Base Voltage	V_{CBO}	20	Vdc
Emitter-Base Voltage	V_{EBO}	2.5	Vdc
Collector Current — Continuous	I_C	50	mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Storage Temperature	T_{stg}	150	°C
*Thermal Resistance Junction to Ambient	$R_{\theta JA}$	357	°C/W

*Package mounted on 99.5% alumina 10 x 8 x 0.6 mm.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 3.0 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	12	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.01 \text{ mAdc}, I_E = 0$)	$V_{(BR)CBO}$	20	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.01 \text{ mAdc}, I_C = 0$)	$V_{(BR)EBO}$	2.5	—	Vdc
Collector Cutoff Current ($V_{CB} = 15 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	0.02	μAdc
ON CHARACTERISTICS				
DC Current Gain ($I_C = 3.0 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$)	h_{FE}	25	—	—
Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$)	$V_{CE(sat)}$	—	0.4	Vdc
Base-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$)	$V_{BE(sat)}$	—	1.0	Vdc
SMALL SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($I_C = 5.0 \text{ mAdc}, V_{CE} = 6.0 \text{ Vdc}, f = 100 \text{ MHz}$)	f_T	900	—	MHz
Collector-Base Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 0.1 \text{ to } 1.0 \text{ MHz}$)	C_{cb}	—	1.0	pF
Small Signal Current Gain ($I_C = 2.0 \text{ mAdc}, V_{CE} = 6.0 \text{ Vdc}, f = 1.0 \text{ kHz}$)	h_{fe}	25	—	—
Noise Figure ($I_C = 1.5 \text{ mAdc}, V_{CE} = 6.0 \text{ Vdc}, R_S = 50 \Omega, f = 200 \text{ Mhz}$)	NF(1)	—	4.5	dB
Common-Emitter Amplifier Power Gain ($V_{CE} = 6.0 \text{ Vdc}, I_C = 5.0 \text{ mAdc}, f = 200 \text{ MHz}$)	$G_{pe(1)}$	15	—	dB

(1) Noise figure and power gain measured on the Ailtech 7380 50 Ω system.