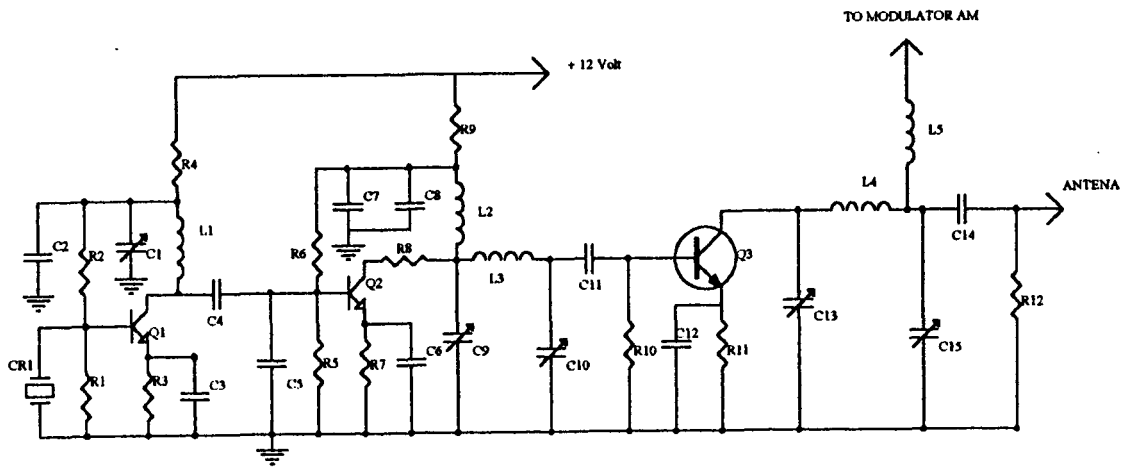
LAMPIRAN A



DAFTAR HARGA KOMPONEN

R1	= 4,7 K	R10	= 270 ohm
R2	= 10 K	R11	= 15 ohm
C1	= 1 to 40 pF	C13	= 1 to 40
C2	= 0,001 uF	C14	= 220 pF
L1	= 8 LILITAN	C15	= 1 to 40
R3	= 330 ohm	R12	= 10 K
C3	= 56 pF	Q1	= 2N5770
C4	= 33 pF	Q2	= 2N5770
C5	= 62 pF	Q3	= 2N5770
R4	= 100 ohm	L4	= 4 LILITAN
R5	= 4,7 K	L5	= 4 LILITAN
R6	= 68 K	CR1	= 100 Mhz
R7	= 100 ohm		
R8	= 10 ohm		
R9	= 100 ohm		
C6	= 0,001 uF		
C7	= 0,001 uF		
C8	= 470 pF		
C9	= 1 to 40 pF		
L2	= 4 LILITAN		
L3	= 4 LILITAN		
C10	= 1 to 40 pF		
C11	= 100 pF		
C12	= 220 pF		

Title	OSILATOR KRISTAL DAN PENGUAT RF	
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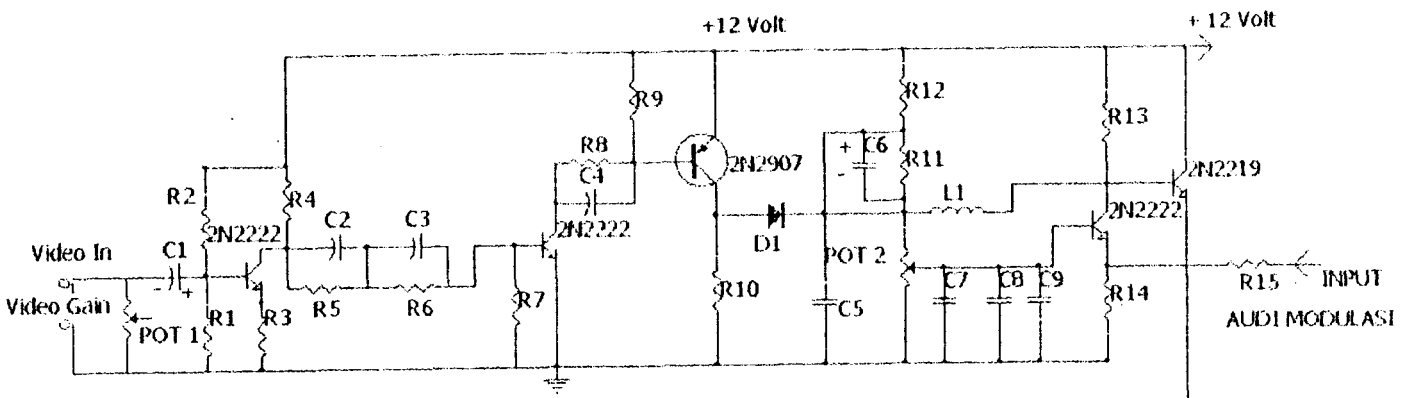
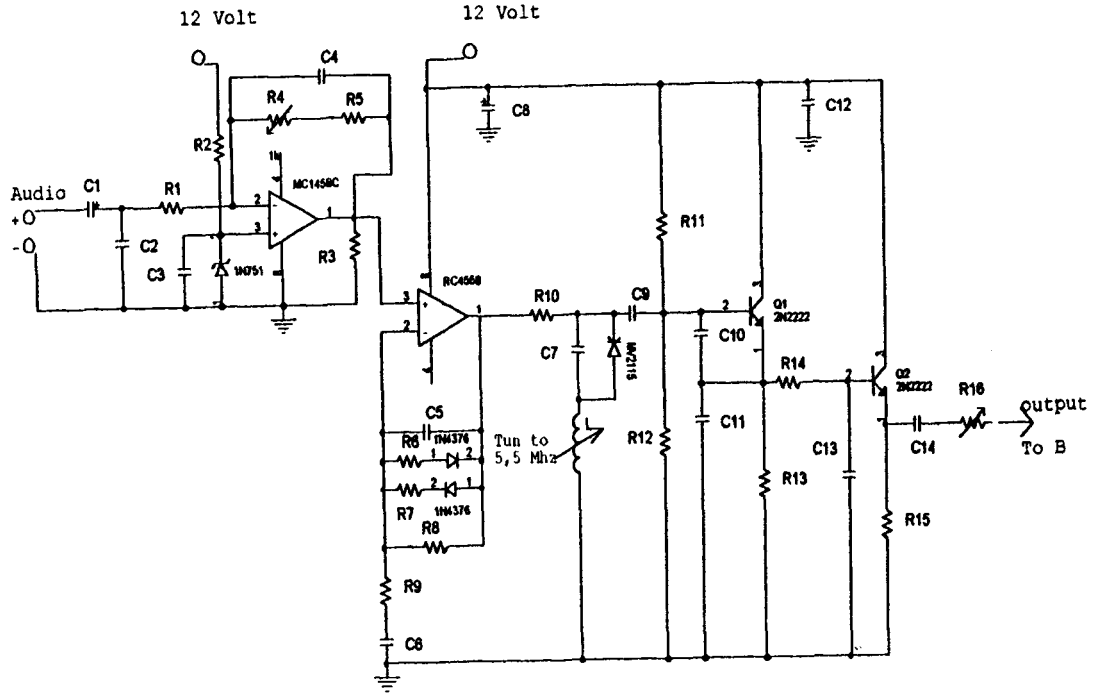


DAFTAR HARGA KOMPONEN

R1 = 4,7 K	R11 = 2,2 K	C4 = 220 uF	Q5 = 2N2219
R2 = 22 K	R12 = 1 K	C5 = 0,1 uF	D1 = 1N914
R3 = 220 Ohm	R13 = 1 K	C6 = 22 pF	L1 = 33 uH
R4 = 1 K	R14 = 100 Ohm	C7 = 0,001 uF	
R5 = 22 K	R15 = 470 Ohm	C8 = 0,1 uF	
R6 = 100 K	POT 1 = 200 Ohm	C9 = 22 pF	
R7 = 100 K	POT 2 = 500 Ohm	Q1 = 2N2222	
R8 = 1K	C1 = 10 uF	Q2 = 2N2222	
R9 = 380 Ohm	C2 = 0,001 uF	Q3 = 2N2907	
R10 = 680 Ohm	C3 = 0,05 uF	Q4 = 2N2222	

MODULASI VIDEO DAN MODULATOR AM

RANGKAIAN MODULASI AUDIO



DAFTAR HARGA KOMPONEN

C1 = 1 uF	R4 = 100 K	D2 = 1N914	R10 = 10 K	R11 = 22 K	C12 = 0,01 uF
C2 = 0,001 uF	R5 = 2200 Ohm	R7 = 1 K	C7 = 47 pF	R12 = 10 K	C13 = 33 pF
C3 = 0,01 Uf	C4 = 10 uF	D3 = 1N914	L = 18 uH	C10 = 470 pF	R15 = 470 Ohm
R1 = 100 Ohm	R3 = 10 K	R8 = 100 K	D4 = MV2115	C11 = 470pF	C14 = 470 pF
R2 = 100 Ohm	C5 = 470 pF	R9 = 1 K	C8 = 100 uF	R14 = 1 K	R16 = 2500 Ohm
D1 = 1N751	R6 = 1 K	C6 = 1 uF	C9 = 470 pF	R13 = 2200 Ohm	IC 1= MC1458
IC 2 = RC4558	Q1 = 2N2222	Q2 = 2N2222			

LAMPIRAN B

2N2218,A/2N2219,A
2N2221,A/2N2222,A
2N5581/82

JAN, JTX, JTXV AVAILABLE

2N2218,A
2N2219,A
CASE 79-02
TO-39 (TO-205AD) STYLE 1

2N2221,A
2N2222,A
CASE 22-03
TO-18 (TO-206AA) STYLE 1

2N5581
2N5582
CASE 26-03
TO-46 (TO-206AB) STYLE 1

GENERAL PURPOSE TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	2N2218 2N2219 2N2221 2N2222	2N2218A 2N2219A 2N2221A 2N2222A	2N5581 2N5582	Unit
Collector-Emitter Voltage	V_{CEO}	30	40	40	Vdc
Collector-Base Voltage	V_{CBO}	60	75	75	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	6.0	6.0	Vdc
Collector Current — Continuous	I_C	800	800	800	mAdc
		2N2218,A 2N2219,A	**2N2221,A 2N2222,A**	**2N5581 2N5582**	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 0.8 4.57	 0.4 2.28	 0.6 3.33	 Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 3.0 17.1	 1.2 6.85	 2.0 11.43	 Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200			°C

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	Non-A Suffix A-Suffix, 2N5581, 2N5582	$V_{(BR)CEO}$	 30 40	 — —	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	Non-A Suffix A-Suffix, 2N5581, 2N5582	$V_{(BR)CBO}$	 60 75	 — —	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	Non-A Suffix A-Suffix, 2N5581, 2N5582	$V_{(BR)EBO}$	 5.0 6.0	 — —	Vdc
Collector Cutoff Current (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 3.0 Vdc)	A-Suffix, 2N5581, 2N5582	I_{CEX}	—	10	nAdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0) (V_{CB} = 60 Vdc, I_E = 0) (V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C) (V_{CB} = 60 Vdc, I_E = 0, T_A = 150°C)	 Non-A Suffix A-Suffix, 2N5581, 2N5582 Non-A Suffix A-Suffix, 2N5581, 2N5582	I_{CBO}	 — — — —	 0.01 0.01 10 10	μAdc
Emitter Cutoff Current (V_{EB} = 3.0 Vdc, I_C = 0)	A-Suffix, 2N5581, 2N5582	I_{EBO}	—	10	nAdc
Base Cutoff Current (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 3.0 Vdc)	A-Suffix	I_{BL}	—	20	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 0.1 mAdc, V_{CE} = 10 Vdc) (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc, T_A = −55°C) (I_C = 150 mAdc, V_{CE} = 10 Vdc)(1)	 2N2218,A, 2N2221,A, 2N5581(1) 2N2219,A, 2N2222,A, 2N5582(1) 2N2218,A, 2N2221,A, 2N5581 2N2219,A, 2N2222,A, 2N5582 2N2218,A, 2N2221,A, 2N5581(1) 2N2219,A, 2N2222,A, 2N5582(1) 2N2218A, 2N2221A, 2N5581 2N2219A, 2N2222A, 2N5582 2N2218,A, 2N2221,A, 2N5581 2N2219,A, 2N2222,A, 2N5582	h_{FE}	 20 35 25 50 35 75 15 35 40 100	 — — — — — — — — 120 300	—

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

Characteristic		Symbol	Min	Max	Unit
(I_C = 150 mAdc, V_{CE} = 1.0 Vdc)(1)	2N2218,A, 2N2221,A, 2N5581		20	—	
	2N2219,A, 2N2222,A, 2N5582		50	—	
(I_C = 500 mAdc, V_{CE} = 10 Vdc)(1)	2N2218, 2N2221		20	—	
	2N2219, 2N2222		30	—	
	2N2218A, 2N2221A, 2N5581		25	—	
	2N2219A, 2N2222A, 2N5582		40	—	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	Non-A Suffix		—	0.4	
	A-Suffix, 2N5581, 2N5582		—	0.3	
(I_C = 500 mAdc, I_B = 50 mAdc)	Non-A Suffix		—	1.6	
	A-Suffix, 2N5581, 2N5582		—	1.0	
Base-Emitter Saturation Voltage(1)		$V_{BE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	Non-A Suffix		0.6	1.3	
	A-Suffix, 2N5581, 2N5582		0.6	1.2	
(I_C = 500 mAdc, I_B = 50 mAdc)	Non-A Suffix		—	2.6	
	A-Suffix, 2N5581, 2N5582		—	2.0	
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product(2)		f_T			MHz
(I_C = 20 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)	All Types, Except		250	—	
	2N2219A, 2N2222A, 2N5582		300	—	
Output Capacitance(3) (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	8.0	pF
Input Capacitance(3)		C_{ibo}			pF
(V_{EB} = 0.5 Vdc, I_C = 0, f = 100 kHz)	Non-A Suffix		—	30	
	A-Suffix, 2N5581, 2N5582		—	25	
Input Impedance		h_{ie}			kohms
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		1.0	3.5	
	2N2219A, 2N2222A		2.0	8.0	
(I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		0.2	1.0	
	2N2219A, 2N2222A		0.25	1.25	
Voltage Feedback Ratio		h_{re}			X 10^{-4}
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		—	5.0	
	2N2219A, 2N2222A		—	8.0	
(I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		—	2.5	
	2N2219A, 2N2222A		—	4.0	
Small-Signal Current Gain		h_{fe}			—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		30	150	
	2N2219A, 2N2222A		50	300	
(I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		50	300	
	2N2219A, 2N2222A		75	375	
Output Admittance		h_{oe}			μmhos
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		3.0	15	
	2N2219A, 2N2222A		5.0	35	
(I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N2218A, 2N2221A		10	100	
	2N2219A, 2N2222A		25	200	
Collector Base Time Constant (I_E = 20 mAdc, V_{CB} = 20 Vdc, f = 31.8 MHz)	A-Suffix	$r_b'C_c$	—	150	ps
Noise Figure (I_C = 100 μAdc, V_{CE} = 10 Vdc, R_S = 1.0 kohm, f = 1.0 kHz)	2N2219A, 2N2222A	NF	—	4.0	dB
Real Part of Common-Emitter *High Frequency Input Impedance* (I_C = 20 mAdc, V_{CE} = 20 Vdc, f = 300 MHz)	2N2218A, 2N2219A	$Re(h_{ie})$	—	60	Ohms
	2N2221A, 2N2222A				

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.
(3) 2N5581 and 2N5582 are Listed C_{cb} and C_{eb} for these conditions and values.

SWITCHING TIME CHARACTERISTICS

FIGURE 9 — TURN-ON TIME

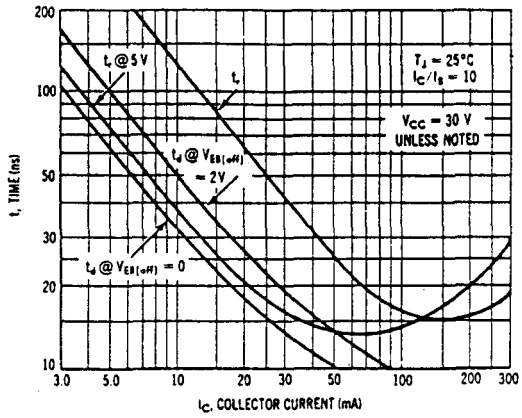


FIGURE 10 — CHARGE DATA

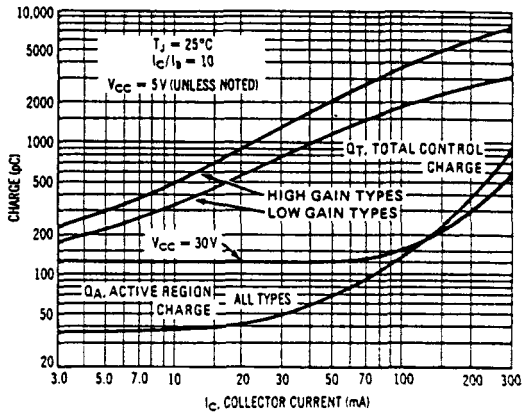


FIGURE 11 — TURN-OFF BEHAVIOR

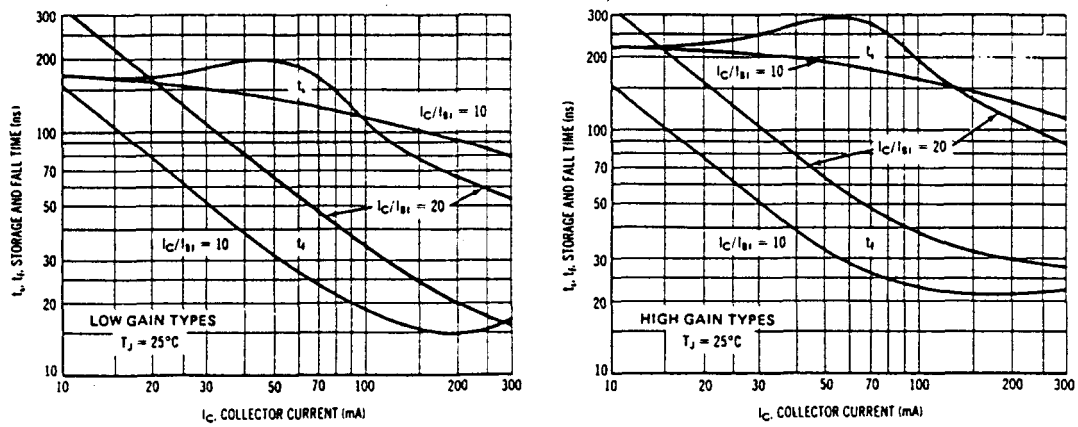


FIGURE 12 — DELAY AND RISE TIME EQUIVALENT TEST CIRCUIT

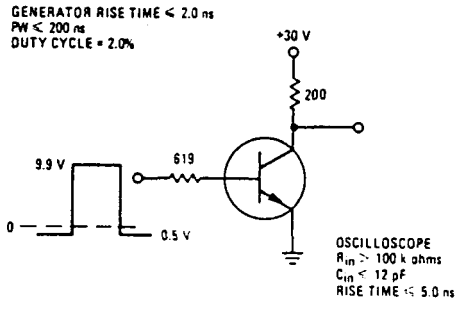
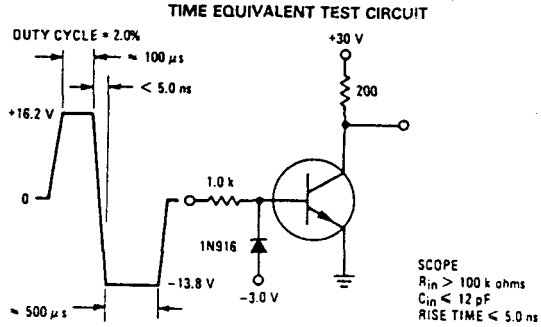


FIGURE 13 — STORAGE TIME AND FALL TIME EQUIVALENT TEST CIRCUIT



2N2904,A, 2N2905,A, 2N2906,A, 2N2907,A, 2N3485,A, 2N3486,A

JAN, JTX, JTXV AVAILABLE*

CASE 79-02, STYLE 1
2N2904/2905 TO-39 (TO-205AD)

CASE 22-03, STYLE 1
2N2906/2907 TO-18 (TO-206AA)

CASE 26-03, STYLE 1
2N3485/3486 TO-46 (TO-206AB)

GENERAL PURPOSE TRANSISTOR
PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Non-A Suffix		A-Suffix	Unit
Collector-Emitter Voltage	V_{CEO}	40		60	Vdc
Collector-Base Voltage	V_{CBO}	60			Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Collector Current — Continuous	I_C	600			mAdc
		2N2904,A 2N2905,A	2N2906,A 2N2907,A	2N3485,A 2N3486,A	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	600 3.43	400 2.28	400 2.28	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	3.0 17.2	1.8 10.3	2.0 11.43	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200			°C

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, I_B = 0)	Non-A Suffix	$V_{(BR)CEO}$	40	—	—	Vdc
	A-Suffix		60	—	—	
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)		$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, V_{BE} = 0.5 Vdc)		I_{CEX}	—	—	50	nAdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0)	Non-A Suffix	I_{CBO}	—	—	0.020	μAdc
	A-Suffix		—	—	0.010	
(V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)	Non-A Suffix		—	—	20	
	A-Suffix		—	—	10	
Base Current (V_{CE} = 30 Vdc, V_{BE} = 0.5 Vdc)		I_B	—	—	50	nAdc
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 0.1 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485		20	—	—	
	2N2905, 2N2907, 2N3486		35	—	—	
	2N2904A, 2N2906A, 2N3485A		40	—	—	
	2N2905A, 2N2907A, 2N3486A		75	—	—	
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485		25	—	—	
	2N2905, 2N2907, 2N3486		50	—	—	
	2N2904A, 2N2906A, 2N3485A		40	—	—	
	2N2905A, 2N2907A, 2N3486A		100	—	—	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485		35	—	—	
	2N2905, 2N2907, 2N3486		75	—	—	
	2N2904A, 2N2906A, 2N3485A		40	—	—	
	2N2905A, 2N2907A, 2N3486A		100	—	—	
(I_C = 150 mAdc, V_{CE} = 10 Vdc)(1)	2N2904A, 2N2906A, 2N3485,A		40	—	120	
	2N2905A, 2N2907A, 2N3486A		100	—	300	

***ALSO AVAILABLE 2N2905ALJANS AND 2N2907AJANS**

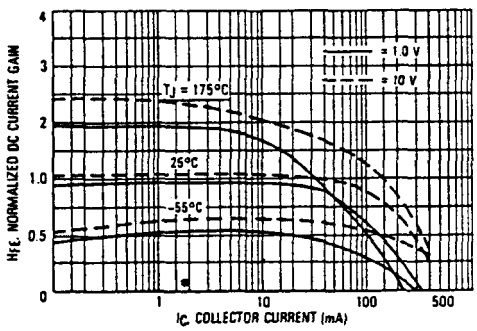
ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
(I_C = 500 mAdc, V_{CE} = 10 Vdc)(1)	2N2904, 2N2906, 2N3485		20	—	—	
	2N2905, 2N2907, 2N3486		30	—	—	
	2N2904A, 2N2906A, 2N3485A		40	—	—	
	2N2905A, 2N2907A, 2N3486A		50	—	—	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)			—	—	0.4	
(I_C = 500 mAdc, I_B = 50 mAdc)			—	—	1.6	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)(1)			—	—	1.3	
(I_C = 500 mAdc, I_B = 50 mAdc)			—	—	2.6	
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product(2) (I_C = 50 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)		f_T	200	—	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	—	8.0	pF
Input Capacitance (V_{BE} = 2.0 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	—	30	pF
SWITCHING CHARACTERISTICS						
Turn-On Time	(V_{CC} = 30 Vdc, I_C = 150 mAdc, I_{B1} = 15 mAdc)	t_{on}	—	26	45	ns
Delay Time		t_d	—	6.0	10	ns
Rise Time		t_r	—	20	40	ns
Turn-Off Time	(V_{CC} = 6.0 Vdc, I_C = 150 mAdc, I_{B1} = I_{B2} = 15 mAdc)	t_{off}	—	70	100	ns
Storage Time		t_s	—	50	80	ns
Fall Time		t_f	—	20	30	ns

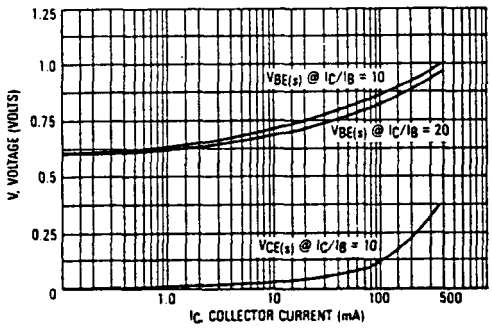
(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

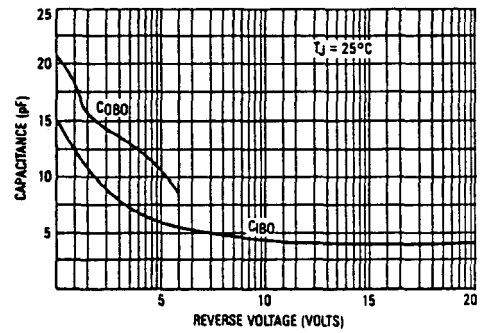
NORMALIZED DC CURRENT GAIN



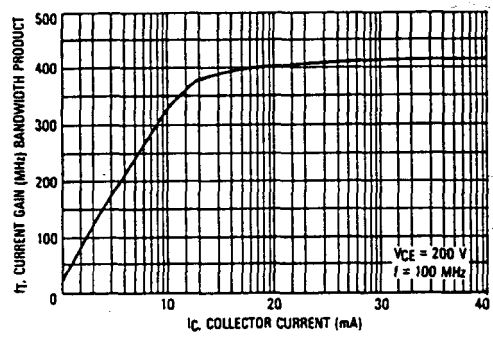
"ON" VOLTAGE



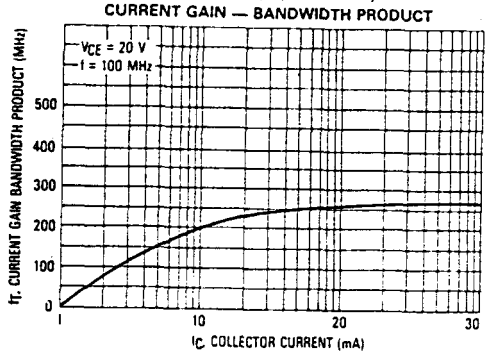
CAPACITANCE



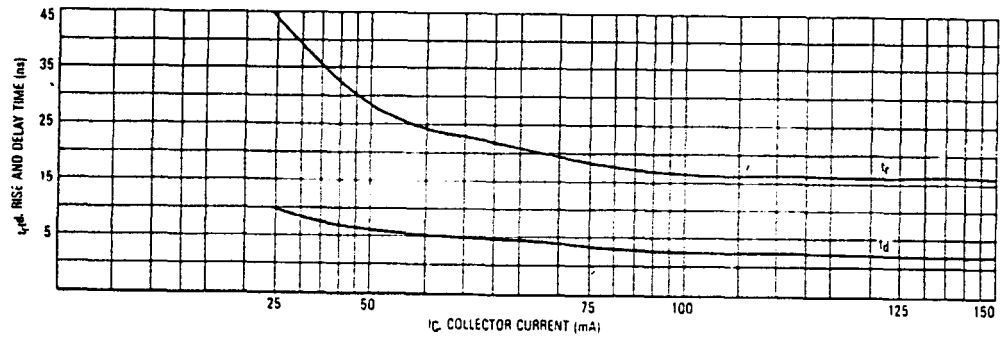
CURRENT GAIN—BANDWIDTH PRODUCT



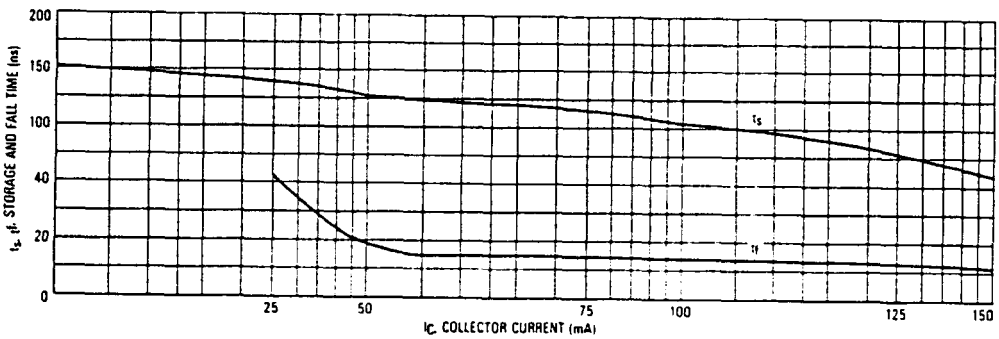
CURRENT GAIN — BANDWIDTH PRODUCT



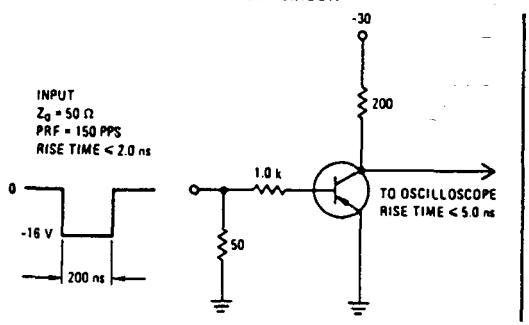
TURN ON BEHAVIOR



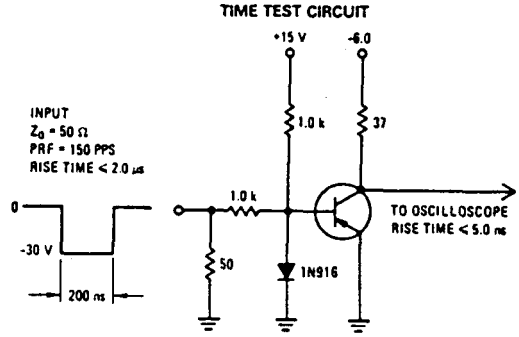
TURN OFF BEHAVIOR



DELAY AND RISE TIME TEST CIRCUIT



STORAGE AND FALL TIME TEST CIRCUIT



TRANSISTOR NUMBER	P M O A L T	PACK-AGE	LEAD INFO	V_{CB} MAX	V_{CE} MAX	V_{EB} MAX	I_C MAX	T_j MAX	P TOT	f_T MIN	C_{ob} MAX	h_{FE}	h_{FE} BIAS	USE	MFR	ALTERNATIVES AND NOTES	
2N5766	N S	X54D	M01	55V	25V	3V	1500mA	175C	19WC	-	12P	20min	100mA	RMA	TRW	-	
2N5766	N S	X54D	M01	55V	25V	3V	700mA	175C	5WC	-	12P	20min	50mA	RMA	TRW	-	
2N5767	N S	X54D	M01	55V	25V	3V	350mA	175C	10WC	-	5P0	20min	100mA	RMA	TRW	-	
2N5768	N S	X54D	M01	55V	25V	3V	700mA	175C	20WC	-	10P	20min	100mA	RMA	TRW	-	
2N5769	N S	TO92	L14	40V	15V	4V	500mA	150C	625mWF	500M	4P0	40/120	10mA	VMS	NAT	BSS11	2N2369A
2N5770	N S	TO92	L14	30V	15V	4V	50mA	150C	625mWF	900M	1P7	20min	3mA	ULS	NAT	2N5179	
2N5771	P S	TO92	L14	15V	15V	4V	50mA	-	310mWF	700M	3P0	50/120	10mA	ULA	NAT	2N4958	
2N5772	N S	TO92	L14	40V	15V	5V	500mA	150C	625mWF	350M	5P0	30/120	30mA	VMS	NAT	BSS11	2N2369A
2N5773	N S	X27	L64	65V	35V	3V	500mA	200C	5WC	-	4P5	20/200	100mA	UMP	TRW	-	
2N5774	N S	X44	X44	65V	35V	3V	1500mA	200C	18WC	-	14P	20/200	100mA	UMP	TRW	-	
2N5775	N S	X80S	-	65V	35V	3V	3A	175C	40WC	-	26P	10/150	100mA	RMG	TRW	-	
2N5776	N S	X80S	-	65V	35V	3V	6A	175C	70WC	-	50P	10/150	200mA	RMG	TRW	-	
2N5781	P S	TO39	L04	80V	65V	5V	2600mA	200C	10WC	8M	-	20/100	1A	RHG	RCA	2N6193	
2N5782	P S	TO39	L04	65V	50V	5V	2600mA	200C	10WC	8M	-	20/100	1200mA	RHG	RCA	2N6193	
2N5783	P S	TO39	L04	45V	40V	5V	2600mA	200C	10WC	8M	-	20/100	1800mA	RHG	RCA	2N6193	
2N5784	N S	TO39	L04	80V	65V	5V	2600mA	200C	10WC	1M	-	20/100	1A	RHG	RCA	BSV64	2N5784
2N5785	N S	TO39	L04	65V	50V	5V	2600mA	200C	10WC	1M	-	20/100	1200mA	RHG	RCA	BSV64	2N5784
2N5786	N S	TO39	L04	45V	40V	5V	2600mA	200C	10WC	1M	-	20/100	1800mA	RHG	RCA	BSV64	2N5784
2N5793	N S	TO77	N01	75V	40V	6V	600mA	200C	600mWF	250M	8P0	40/120	150mA	DUA	MOT	BFX10	2N3409
2N5794	N S	TO77	N01	75V	40V	6V	600mA	200C	600mWF	250M	8P0	100min	150mA	DUA	MOT	BFX10	2N3409
2N5795	P S	TO77	N01	80V	60V	5V	600mA	200C	600mWF	200M	8P0	40/120	150mA	DUA	MOT	BFX11	2N4015
2N5796	P S	TO77	N01	80V	60V	5V	600mA	200C	600mWF	200M	8P0	100min	150mA	DUA	MOT	BFX11	2N4015
2N5884	N S	TO3	L06	300V	225V	6V	5A	200C	110WC	15M	-	10/100	5A	RHE	RCA	BUX10C	2N5157
2N5885	N S	TO3	L06	375V	300V	6V	5A	200C	110WC	15M	-	10/100	5A	RHE	RCA	BUX10C	2N5157
2N5810	N S	X16	L30	35V	25V	5V	750mA	135C	500mWF	100M	15P	45min	500mA	AMG	GES	BC338	2N5818
2N5811	P S	X16	L30	35V	25V	5V	750mA	135C	500mWF	100M	15P	45min	500mA	AMG	GES	BC328	2N5819
2N5812	N S	X16	L30	35V	25V	5V	750mA	135C	500mWF	125M	15P	80min	500mA	AMG	GES	BC338	2N5818
2N5813	P S	X16	L30	35V	25V	5V	750mA	135C	500mWF	125M	15P	80min	500mA	AMG	GES	BC328	2N5819
2N5814	N S	X16	L30	50V	40V	5V	750mA	135C	500mWF	100M	15P	80/120	2mA	AMG	GES	BC337	2N5818
2N5815	P S	X16	L30	50V	40V	5V	750mA	135C	500mWF	100M	15P	80/120	2mA	AMG	GES	BC327	2N5819
2N5816	N S	X16	L30	50V	40V	5V	750mA	135C	500mWF	120M	15P	100min	2mA	AMG	GES	BC337	2N5818
2N5817	P S	X16	L30	50V	40V	5V	750mA	135C	500mWF	120M	15P	100min	2mA	AMG	GES	BC327	2N5819
2N5818	N S	X16	L30	50V	40V	5V	750mA	135C	500mWF	135M	15P	150min	2mA	AMG	GES	BC337	2N5818
2N5819	P S	X16	L30	50V	40V	5V	750mA	135C	500mWF	135M	15P	150min	2mA	AMG	GES	BC327	2N5819
2N5820	N S	X16	L30	70V	60V	5V	750mA	135C	500mWF	100M	15P	20min	500mA	AMH	GES	BC337	
2N5821	P S	X16	L30	70V	60V	5V	750mA	135C	500mWF	100M	15P	20min	500mA	AMH	GES	BC327	
2N5822	N S	X16	L30	70V	60V	5V	750mA	135C	500mWF	120M	15P	25min	500mA	AMH	GES	BC337	
2N5823	P S	X16	L30	70V	60V	5V	750mA	135C	500mWF	120M	15P	25min	500mA	AMH	GES	BC327	
2N5824	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	80/120	2mA	ALG	GES	BC237	2N5825
2N5826	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	100min	2mA	ALG	GES	BC237	2N5825
2N5826	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	150min	2mA	ALG	GES	BC237	2N5825
2N5827	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	250min	2mA	ALN	GES	BC239	2N5827
2N5827A	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	250min	2mA	ALN	GES	BC237	2N5825
2N5828	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	400min	2mA	ALG	GES	BC237	2N5825
2N5828A	N S	X16	L30	50V	40V	5V	100mA	125C	360mWF	90M	4P0	400min	2mA	ALN	GES	BC237	2N5825
2N5829	P S	TO72	L06	30V	30V	3V	30mA	200C	200mWF	1200M	9P8	20/150	2mA	ULA	MOT	2N4261	
2N5830	N S	TO92	L14	120V	100V	5V	600mA	150C	625mWF	100M	4P0	80/500	10mA	TVH	FCD	BCX22	2N4001
2N5831	N S	TO92	L14	160V	140V	5V	600mA	150C	625mWF	100M	4P0	80/250	10mA	TVH	FCD	BFT57	2N5681
2N5832	N S	TO92	L14	180V	140V	5V	600mA	150C	625mWF	100M	4P0	175min	10mA	TVH	NAT	2N5681	
2N5833	N S	TO92	L14	200V	190V	6V	600mA	150C	625mWF	100M	4P0	50/250	10mA	TVH	FCD	2N6517	
2N5834	P S	TO5	L04	80V	40V	4V	1A	175C	5WC	-	-	10min	250mA	VMA	TIS	BC161	2N4037
2N5835	N S	TO72	L06	15V	10V	3V	15mA	200C	200mWF	2500M	0P8	25min	10mA	SLG	MOT	-	
2N5836	N S	TO46	L01	15V	15V	3V	200mA	200C	2WC	2G	3P5	25min	50mA	SMG	MOT	-	
2N5837	N S	TO46	L01	15V	5V	3V	300mA	200C	2WC	1790M	5P0	25min	100mA	SMG	MOT	BFT17	2N5490
2N5838	N S	TO3	L06	275V	250V	6V	3A	200C	100WC	5M	-	8/40	3A	RHE	RCA	BUX10C	2N5157
2N5839	N S	TO3	L06	300V	275V	6V	3A	200C	100WC	5M	-	10/50	2A	RHE	RCA	BUX10C	2N5157
2N5840	N S	TO3	L06	375V	350V	6V	3A	200C	100WC	5M	-	10/50	2A	RHE	RCA	BUX10C	2N5157
2N5841	N S	TO72	L36	20V	10V	3V	100mA	200C	350mWF	2200M	1P5	25/200	25mA	SMS	MOT	-	
2N5842	N S	TO72	L36	20V	10V	3V	100mA	200C	350mWF	1700M	1P5	25/250	25mA	SMS	MOT	-	
2N5843	P S	TO77	N01	50V	40V	5V	50mA	200C	600mWF	200M	8P0	50/150	1mA	DUA	MOT	9% OVBE	BFX11
2N5844	P S	TO77	N01	50V	40V	5V	50mA	200C	600mWF	250M	8P0	100min	1mA	DUA	MOT	9% OVBE	BFX11
2N5845	N S	TO92	L14	50V	40V	6V	1A	150C	625mWF	300M	9P0	25/150	500mA	VMS	MOT	2N5858	
2N5845A	N S	TO92	L14	50V	40V	6V	1A	150C	625mWF	200M	9P0	35/150	500mA	VMS	MOT	2N5858	
2N5846	N S	X28	L58	36V	18V	4V	1A	200C	10WC	-	25P	5min	250mA	VMP	MOT	-	
2N5847	N S	X28	L68	36V	18V	4V	2A	200C	20WC	-	50P	5min	500mA	VHP	MOT	-	
2N5848	N S	X28	L85	48V	24V	4V	3500mA	200C	50WC	-	125P	3min	1200mA	RHP	MOT	-	
2N5849	N S	X28	L85	48V	24V	4V	7A	200C	100WC	-	230P	3min	2500mA	RHP	MOT	-	
2N5851	N S	TO72	L06	30V	15V	4V	100mA	200C	500mWC	800M	1P5	40min	10mA	SMG	MOT	2N5852	
2N5852	N S	TO72	L06	30V	15V	4V	100mA	200C	500mWC	1100M	1P5	40min	10mA	SMG	MOT	2N5852	
2N5853	P S	TO61	L46	100V	80V	8V	10A	200C	88WC	15M	-	30/90	5A	RHH	KER	BDY88	2N5677
2N5854	N S	TO61	L46	100V	80V	8V	10A	200C	88WC	20M	-	30/90	5A	RHH	KER	BDY63	2N5731
2N5855	P S	TO105	L04	80V	60V	5V	1A	125C	750mWF	15M	100P	50/300	150mA	AMG	FCD	BFS95	2N4036
2N5856	N S	TO105	L64	80V	60V	5V	1A	175C	750mWF	200M	12P	50/300	50mA	AMG	FCD	BFY56	2N2297
2N5857	P S	TO106	L84	80V	90V	5V	1A	175C	750mWF	15M	100P	50/300	150mA	AMG	FCD	BFS93	2N4037
2N5858	N S	TO105	L84	80V	80V	5V	1A	125C	750mWF	200M	12P	50/300	50mA	AMG	FCD	BSW66	2N1893

TRANSISTOR NUMBER	P M O A L T	PACK-AGE	LEAD INFO	V_{CB} MAX	V_{CE} MAX	V_{EB} MAX	I_C MAX	T_j MAX	P TOT	f_T MIN	C_{ob} MAX	h_{FE}	h_{FE} BIAS	USE	MFR	ALTERNATIVES AND NOTES	
2N2172	P G	TO6	L04	20V	15V	-	500mA	85C	200mW	5M	20P	30/150	10mA	RMS	OBS	ASY27	2N1305
2N2173	P G	TO39	L04	25V	15V	-	750mA	100C	240mW	-	6P0	30mn	200mA	RMS	OBS	ASY27	2N1306
2N2175	P S	TO6	L04	6V	6V	-	50mA	175C	100mW	10M	10P	30mn	20uA	ALN	OBS	BC328	2N2605
2N2176	P S	TO18	L01	6V	6V	-	50mA	175C	100mW	10M	10P	30mn	20uA	ALN	OBS	BC328	2N2605
2N2177	P S	TO6	L04	6V	6V	-	50mA	160C	100mW	8M	14P	15mn	5uA	ALN	OBS	BC328	2N2605
2N2178	P S	TO18	L01	6V	6V	- -	50mA	160C	100mW	8M	14P	15mn	5uA	ALN	OBS	BC328	2N2605
2N2180	P G	X18	M11	15V	8V	15V	50mA	100C	50mW	80M	6P0	120tp	500uA	RLS	OBS	OC44	2N2614
2N2181	P S	TO1	L02	25V	25V	-	50mA	140C	150mW	6M	12P	10mn	5mA	ALC	OBS	BCY94	2N2946A
2N2182	P S	TO1	L02	25V	25V	-	50mA	140C	150mW	6M	12P	10mn	5mA	ALC	OBS	BCY94	2N2946A
2N2183	P S	TO1	L02	15V	10V	-	50mA	140C	150mW	6M	12P	10mn	5mA	ALC	OBS	BCY94	2N2946A
2N2184	P S	TO1	L02	15V	10V	-	50mA	140C	150mW	8M	12P	10mn	5mA	ALC	OBS	BCY94	2N2946A
2N2185	P S	TO18	L01	30V	30V	-	50mA	140C	150mW	6500K	9P0	10mn	5mA	ALC	OBS	BCY94	2N2946A
2N2186	P S	TO18	L01	30V	30V	-	50mA	140C	150mW	6500K	9P0	10mn	5mA	MPP	OBS	BCY94 x2	2N2946A
2N2187	P S	TO18	L01	30V	30V	-	50mA	140C	150mW	6500K	9P0	10mn	5mA	MPP	OBS	BCY94 x2	2N2946A
2N2188	P G	TO1H	L02	40V	40V	-	30mA	75C	125mW	80M	2P5	40mn	2mA	RLG	OBS	AF124	2N990
2N2189	P G	TO1H	L02	40V	40V	-	30mA	75C	125mW	102M	2P5	60mn	2mA	RLG	OBS	AF124	2N990
2N2190	P G	TO1H	L02	60V	60V	-	30mA	75C	125mW	80M	2P5	40mn	2mA	RLG	OBS	AF124	2N990
2N2191	P G	TO1H	L02	60V	60V	-	30mA	75C	125mW	102M	2P5	60mn	2mA	RLG	OBS	AF124	2N990
2N2192	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	100mn	150mA	RMS	MOT	BFY50	2N2297
2N2192A	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	100mn	150mA	RMS	MOT	BFY50	2N2297
2N21928	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	100mn	150mA	AMG	MOT	BFY50	2N2297
2N2193	N S	TO5	L04	80V	50V	8V	1A	175C	800mW	50M	20P	40/120	150mA	AMG	MOT	BSW66	2N4001
2N2193A	N S	TO5	L04	80V	50V	8V	1A	175C	800mW	50M	20P	40/120	150mA	AMG	MOT	BFY50	2N2297
2N2193B	N S	TO5	L04	80V	50V	8V	1A	200C	800mW	50M	20P	40/120	150mA	AMG	MOT	BFY50	2N2297
2N2193C	N S	TO39	L04	80V	50V	8V	1A	175C	800mW	50M	20P	40/120	1A	AMG	MOT	BFY50	2N2297
2N2193AS	N S	TO39	L04	80V	50V	8V	1A	175C	800mW	50M	20P	40/120	150mA	AMG	MOT	BFY50	2N2297
2N2193BS	N S	TO39	L04	80V	50V	8V	1A	200C	800mW	50M	20P	40/120	150mA	AMG	MOT	BFY50	2N2297
2N2194	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2194A	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2194B	N S	TO5	L04	60V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2194B	N S	TO39	L04	60V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2194AS	N S	TO39	L04	80V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2194BS	N S	TO39	L04	80V	40V	5V	1A	200C	800mW	50M	20P	20/80	150mA	AMG	MOT	BFY50	2N2297
2N2195	N S	TO5	L04	45V	25V	5V	1A	175C	800mW	50M	20P	20mn	150mA	AMG	STM	BFY50	2N2297
2N2195A	N S	TO5	L04	45V	25V	5V	1A	175C	800mW	50M	20P	20mn	150mA	AMG	STM	BFY50	2N2297
2N2196B	N S	TO5	L04	45V	25V	5V	1A	200C	800mW	50M	20P	20mn	150mA	AMG	MOT	BFY50	2N2297
2N2196B	N S	TO39	L04	45V	25V	5V	1A	175C	800mW	50M	20P	20mn	150mA	AMG	MOT	BFY50	2N2297
2N2195AS	N S	TO39	L04	45V	25V	5V	1A	175C	800mW	50M	20P	20mn	150mA	AMG	MOT	BFY50	2N2297
2N2196BS	N S	TO39	L04	45V	25V	5V	1A	175C	800mW	50M	20P	20mn	150mA	AMG	MOT	BFY50	2N2297
2N2196	N S	TO6F	L44	80V	60V	8V	1A	175C	2WF	-	-	30/90	200mA	AMH	STM	2N2197	
2N2197	N S	TO6F	L44	80V	60V	8V	1A	175C	2WF	-	-	75/200	200mA	AMH	STM	2N2197	
2N2198	N S	TO6	L04	80V	80V	-	200mA	200C	800mW	4M	12OP	35/55	100mA	AMH	OBS	BSW66	2N1883
2N2199	P G	TO5	L04	15V	10V	-	100mA	100C	75mW	120M	2P8	9mn	3mA	VLA	OBS	AF106	2N3283
2N2200	P J	TO5	L04	15V	10V	-	100mA	100C	75mW	120M	2P8	9mn	3mA	VLA	OBS	AF106	2N3283
2N2201	N S	TO6F	L44	120V	100V	-	1A	175C	2WC	10M	75P	25/90	200mA	RME	OBS	BSW67	2N5682
2N2202	N S	O6S	L04	120V	100V	10V	1A	175C	1WF	10M	75P	25/90	200mA	RMS	OBS	BSW66	2N5681
2N2203	N S	O6S	L06	120V	100V	10V	1A	175C	1WF	10M	75P	25/90	200mA	RMS	OBS	BSW66	2N5681
2N2204	N S	O6S	O6S	120V	100V	10V	1A	175C	1WF	10M	75P	25/90	200mA	RMS	OBS	BSW66	2N5181
2N2206	N S	TO18	L01	25V	12V	3V	200mA	175C	300mW	200M	6P	40/120	10mA	RLS	STM	BSX20	2N2369
2N2206	N S	TO46	L01	25V	12V	3V	200mA	175C	300mW	200M	6P0	40/120	10mA	RLS	STM	BSX20	2N2369
2N2207	P G	TO7	L07	70V	50V	-	50mA	75C	250mW	140M	13P	30/370	10mA	VLA	OBS	-	
2N2208	P G	TO1H	L08	40V	10V	-	10mA	85C	120mW	-	3P0	30mn	1500uA	RLA	OBS	AFY18	2N2382
2N2209	P G	TO6	L04	30V	12V	-	100mA	85C	150mW	6M	20P	50mn	24mA	RMS	OBS	ASY27	2N1305
2N2210	N S	TO39	L04	80V	65V	7V	-	200C	1WF	100M	15P	50/200	150mA	AMG	MCE	BFY50	7N2297
2N2211	P G	TO3	L06	80V	-	-	5A	100C	90WC	-		60/140	1A	AMG	OBS	AD132 S	7N1542
2N2212	P G	TO3	L06	120V	120V	1V	10A	100C	80WC	450K	-	50/120	5A	AMH	GPD	AU106	2Nb155
2N2214	N S	X41	L84	25V	15V	-	200mA	150C	250mW	200M	7P0	75mn	10mA	VLS	OBS	-	
2N2216	P S	TO6	L04	150V	100V	-	250mA	200C	800mW	50M	15P	25/120	50mA	RME	OBS	BFT19	2N4929
2N2217	N S	TO5	L04	60V	30V	5V	800mA	175C	800mW	250M	8P0	20mn	150mA	RMS	MOT	BFX97	2N2219A
2N2217A	N S	TO5	L04	75V	40V	6V	800mA	175C	800mW	250M	8P0	20mn	150mA	RMS	MOT	BFX97	2N2219A
2N2218	N S	TO5	L04	60V	30V	5V	800mA	175C	800mW	250M	8P0	40/120	150mA	RMG	STM	BSW54	2N2219A
2N2218A	N S	TO5	L04	75V	40V	6V	800mA	175C	800mW	250M	8P0	40/120	150mA	RMG	STM	BSW54	2N2219A
2N2218S	N S	TO39	L04	60V	30V	6V	800mA	175C	800mW	250M	8P0	40/120	150mA	RMG	MOT	BSW54	2N2218
2N2218AS	N S	TO39	L04	75V	40V	6V	800mA	175C	800mW	250M	8P0	40/120	150mA	RMG	MOT	BSW54	2N2218A
2N2219	N S	TO5	L04	60V	30V	5V	800mA	175C	800mW	250M	8P0	100mn	150mA	RMG	STM	BSW54	2N2219A
2N2219A	N S	TO5	L04	75V	50V	6V	800mA	175C	800mW	300M	8P0	100mn	150mA	RMG	STM	BSW54	2N2219A
2N2219S	N S	TO39	L04	60V	30V	5V	800mA	175C	800mW	250M	8P0	100mn	150mA	RMG	MOT	BSW54	2N2219
2N2219AS	N S	TO39	L04	75V	50V	6V	800mA	175C	800mW	300M	8P0	100mn	150mA	RMG	MOT	BSW54	2N2218A
2N2220	N S	TO18	L01	60V	30V	5V	800mA	175C	500mW	250M	8P0	20mn	150mA	RMS	MOT	BFX96	2N2222A
2N2220A	N S	TO18	L01	75V	40V	6V	800mA	175C	500mW	250M	8P0	20mn	150mA	RMS	MOT	BFX96	2N2222A
2N2221	N S	TO18	L01	60V	30V	5V	800mA	175C	500mW	250M	8P0	40/120	150mA	RMG	STM	BSW64	2N2222A
2N2221A	N S	TO18	L01	75V	40V	6V	800mA	175C	500mW	250M	8P0	40/120	150mA	RMG	STM	BSW64	2N2222A
2N2223	N S	TO18	L01	80V	30V	5V	800mA	175C	500mW	250M	8P0	100mn	150mA	RMG	STM	BSW64	2N2222A
2N2222A	N S	TO18	L01	75V	40V	6V	800mA	175C	500mW	300M	8P0	100mn	150mA	RMG	STM	BSW64	2N2222A
2N2223	N S	TO77	N01	100V	80V	7V	500mA	200C	800mW	50M	15P	50mn	10mA	OUA	TIS	20% OVBE	BFX71

BIODATA

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NAMA : DONNY KRISTIANTO

NRP : 5103094070

Tempat / Tanggal lahir : Surabaya, 14 – JULI 1975

Agama : Islam

Alamat : Jl. GERSIKAN III / 21

Tahun 1988 tamat SDN Pacar Keling VII Surabaya

Tahun 1991 tamat SMP ST. Stanislaus Surabaya

Tahun 1994 tamat SMA Sejahtera I Surabaya

Tahun 1994 Mahasiswa Universitas Katolik Widya Mandala Surabaya