

2N3675-2N3765

TYPE	MATERIAL		REPLACE- MENT	PAGE NUMBER	USE	MAXIMUM RATINGS					ELECTRICAL CHARACTERISTICS									
	Symbol	Material				P _D @ 25°C	T _J °C	V _{CB} (volts)	V _{CE} - (volts)	Subscript	h _{FE} @ I _C (min)	h _{FE} @ I _C (max)	I _C Units	V _{CE(SAT)} @ I _C (volts)	V _{CE(SAT)} @ I _C (volts)	h _{FE}	Subscript	f _T Units	Subscript	
2N3675	S	N			PMS	8.8W	C	200	90	55	0	12	60	1.0A	0.8	1.0A			1.0M	T
2N3676	S	N			PMS	8.8W	C	200	90	90	0	12	60	1.0A	0.8	1.0A			1.0M	T
2N3677	S	N			CHP	0.4W	A	200	30	20	0								5.0M	T
2N3678	S	N			HSS	0.8W	A	200	75	55	0	40	120	0.15A	0.4	0.15A			250M	T
2N3679	Unijunction Transistor, see Table on Page 1-174																			
2N3680	S	N			DFA	0.3W	A	200	60	50	0	150	600	10*	0.7	10M	300	E	60M	T
2N3681	S	N			RFA	0.2W	A	200	10	7.0	0	20	220	2.0M	0.37	4.0M	20	E	1.0G	T
2N3682	S	N			RFA	0.36W	A	200	40	15	0	40	120	1.0M			45	E	600M	T
2N3683	S	N			RFA	0.2W	A	200	30	12	0	20	150	8.0M			30	E	1.0G	T
2N3684	Field Effect Transistors, see Table on Page 1-166																			
2N3687																				
2N3688	S	N			RFC	0.2W	A	125	40	40	0	30		4.0M					400M	T
2N3689	S	N			RFC	0.2W	A	125	40	40	0	30		4.0M					400M	T
2N3690	S	N			RFC	0.2W	A	125	40	40	0	30		4.0M					400M	T
2N3691	S	N	MPS6512	5-109	AFD	0.25W	A	125	35	20	0	40	160	10M	0.7	10M	40	E	200M	T
2N3692	S	N	MPS6513	5-109	AFD	0.2W	A	125	35	20	0	100	400	10M	0.7	10M	100	E	200M	T
2N3693	S	N			RFC	0.25W	A	125	45	45	0	40	160	10M					200M	T
2N3694	S	N			RFC	0.2W	A	125	45	45	0	100	400	10M					200M	T
2N3695	Field Effect Transistors, see Table on Page 1-166																			
2N3698																				
2N3700	S	N			RFA	0.5W	A	200	140	80	0	100	300	0.15A	0.2	0.15A	80	E	100M	T
2N3701	S	N			RFA	0.5W	A	200	140	80	0	40	120	0.15A	0.2	0.15A	30	E	80M	T
2N3702	S	P			AFD	0.3W	A	150	40	25	0	60	300	50M	0.25	50M			100M	T
2N3703	S	P			AFD	0.3W	A	150	50	30	0	30	150	50M	0.25	50M			100M	T
2N3704	S	N			AFD	0.36W	A	150	50	30	0	100	300	50M	0.6	0.1A			100M	T
2N3705	S	N			AFD	0.36W	A	150	50	30	0	50	150	50M	0.8	0.1A			100M	T
2N3706	S	N			AFD	0.36W	A	150	40	20	0	30	600	50M	1.0	0.1A			100M	T
2N3707	S	N			AFD	0.25W	A	150	30	30	0	100	400	0.1M	1.0	10M	100	E	100M	T
2N3708	S	N			AFD	0.25W	A	150	30	30	0	45	660	1.0M	1.0	10M	45	E	45	T
2N3709	S	N			AFD	0.25W	A	150	30	30	0	45	165	1.0M	1.0	10M	45	E	45	T
2N3710	S	N			AFD	0.25W	A	150	30	30	0	90	330	1.0M	1.0	10M	90	E	90	T
2N3711	S	N			AFD	0.25W	A	150	30	30	0	180	660	1.0M	1.0	10M	180	E	180	T
2N3712	S	N			RFC	0.8W	A	200	150	150	0	30	150	30M	2.0	50M	25	E	40M	T
2N3713	S	N	7-125		HPA	150W	C	200	80	60	0	25	75	1.0A	1.0	5.0A	25	E	30K	T
2N3714	S	N	7-125		HPA	150W	C	200	100	80	0	25	75	1.0A	1.0	5.0A	25	E	30K	T
2N3715	S	N	7-125		HPA	150W	C	200	80	60	0	50	150	1.0A	0.8	5.0A	25	E	30K	T
2N3716	S	N	7-125		HPA	150W	C	200	100	80	0	50	150	1.0A	0.8	5.0A	25	E	30K	T
2N3717	S	N			HPA	7.5W	C	200	60	60	S	2.0	100	0.5A	1.0	0.5A			250M	T
2N3718	S	N			HPA	10W	C	200	60	60	S	2.0	100	0.5A	1.0	0.5A			250M	T
2N3719	S	P	7-129		PHS	6.0W	C	200	40	40	0	25	180	1.0A	1.5	3.0A			60M	T
2N3720	S	P	7-129		PHA	6.0W	C	200	60	60	0	25	180	1.0A	1.5	3.0A			60M	T
2N3721	S	N			AFD	0.2W	A	125	18	18	0						60	E		T
2N3722	S	N			MSS	0.8W	A	200	80	60	0	40	150	0.1A	0.22	0.1A			300M	T
2N3723	S	N			HSS	0.8W	A	200	100	80	0	40	150	0.1A	0.25	10M			300M	T
2N3724	S	N			HSS	0.8W	A	200	50	30	0	60	150	0.1A	0.2	0.1A			300M	T
2N3724A	S	N	8-257		HSS	1W	A	200	50	30	0	60	150	100M	0.2	100M				T
2N3725	S	N	8-257		HSS	0.8W	A	200	80	50	0	60	150	0.1A	0.26	0.1A			300M	T
2N3725A	S	N	8-257		HSS	1W	A	200	80	50	0	60	150	100M	0.26	100M	3	E		T
2N3726	S	P			DFA	0.4W	A	200	45	45	0	135	350	1.0M	0.25	50M	135	E	200M	T
2N3727	S	P			DFA	0.4W	A	200	45	45	0	135	350	1.0M	0.25	50M	135	E	200M	T
2N3728	S	N			DFA	0.45W	A	200	60	30	0	80	280	0.15A	0.22	0.15A	50	E	250M	T
2N3729	S	N	8-259		DFA	0.45W	A	200	60	30	0	80	280	0.15A	0.22	0.15A	50	E	250M	T
2N3730	G	P	8-259		LPA	10W	A	100	200	200	S									T
2N3731	G	P	8-259		LPA	5.0W	A	100	320	320	S	15		6.0A						T
2N3732	G	P	8-259		LPA	3.0W	A	100	100	100	S	35		0.7A						T
2N3733	S	N	9-82		HPA	23W	C	200	65	40	0	10	150	0.25A	1.0	1.0A			250M	T
2N3734	S	N	8-259		HSS	1.0W	A	200	50	30	0	30	120	1.0A	0.2	10M			300M	T
2N3734A	S	N	8-259		HSS	1.0W	A	200	50	30	0	30	120	1.0A	0.9	1.0A	2.5	E		T
2N3735	S	N	8-259		HSS	1.0W	A	200	75	50	0	20	80	1.0A	0.2	10M			250M	T
2N3735A	S	N	8-259		HSS	1.0W	A	200	75	50	0	20	80	1.0A	0.9	1.0A	2.5	E		T
2N3736	S	N	8-259		HSS	0.5W	A	200	50	30	0	30	120	1.0A	0.2	10M			300M	T
2N3736A	S	N	8-259		HSS	0.5W	A	200	50	30	0	30	120	1.0A	0.9	1.0A	2.5	E		T
2N3737	S	N	8-259		HSS	0.5W	A	200	75	50	0	20	80	1.0A	0.2	10M			250M	T
2N3737A	S	N	8-259		HSS	0.5W	A	200	75	50	0	20	80	1.0A	0.9	1.0A	2.5	E		T
2N3738	S	N	7-133		LPA	20W	C	175	250	225	0	40	200	0.1A	2.5	0.25A	35	E	15M	T
2N3739	S	N	7-133		LPA	20W	C	175	325	300	0	40	200	0.1A	2.5	0.25A	35	E	15M	T
2N3740	S	P	7-137		LPA	25W	C	200	60	60	0	30	100	0.25A	0.6	1.0A	25	E	4.0M	T
2N3741	S	P	7-137		LPA	25W	C	200	80	80	0	30	100	0.25A	0.6	1.0A	25	E	4.0M	T
2N3742	S	N	8-265		VID	1.0W	A	200	300	300	0	20	200	30M	1.0	10M	20	E	30M	T
2N3743	S	P	8-269		VID	1.0W	A	200	300	300	0	25	250	30M	5.0	10M	30	E	30M	T
2N3744	S	N			HPA	30W	C	200	60	40	0	20	60	1.0A	0.25	1.0A	20	E	30M	T
2N3745	S	N			HPA	30W	C	200	80	60	0	20	60	1.0A	0.25	1.0A	20	E	30M	T
2N3746	S	N			HPA	30W	C	200	100	80	0	20	60	1.0A	0.25	1.0A	20	E	30M	T
2N3747	S	N			HPA	30W	C	200	60	40	0	40	120							

2N3724, 2N3725 — 2N4013, 2N4014 (continued)

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

Characteristic	Symbol	Min	Max	Unit
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ON CHARACTERISTICS (continued)

Collector-Emitter Saturation Voltage* ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$)	2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014	$V_{CE(sat)}$ *	-	0.25	Vdc
($I_C = 100\text{ mAdc}$, $I_B = 10\text{ mAdc}$)			-	0.20	
($I_C = 300\text{ mAdc}$, $I_B = 30\text{ mAdc}$)			-	0.26	
($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)			-	0.32	
($I_C = 800\text{ mAdc}$, $I_B = 80\text{ mAdc}$)			-	0.40	
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			-	0.42	
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			-	0.52	
Base-Emitter Saturation Voltage* ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$)	2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014 2N3724, 2N4013 2N3725, 2N4014	$V_{BE(sat)}$ *	-	0.76	Vdc
($I_C = 100\text{ mAdc}$, $I_B = 10\text{ mAdc}$)			-	0.86	
($I_C = 300\text{ mAdc}$, $I_B = 30\text{ mAdc}$)			-	1.1	
($I_C = 500\text{ mAdc}$, $I_B = 50\text{ mAdc}$)			0.9	1.2	
($I_C = 800\text{ mAdc}$, $I_B = 80\text{ mAdc}$)			-	1.5	
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			-	1.7	
($I_C = 1.0\text{ Adc}$, $I_B = 100\text{ mAdc}$)			-	1.7	

SMALL-SIGNAL CHARACTERISTICS

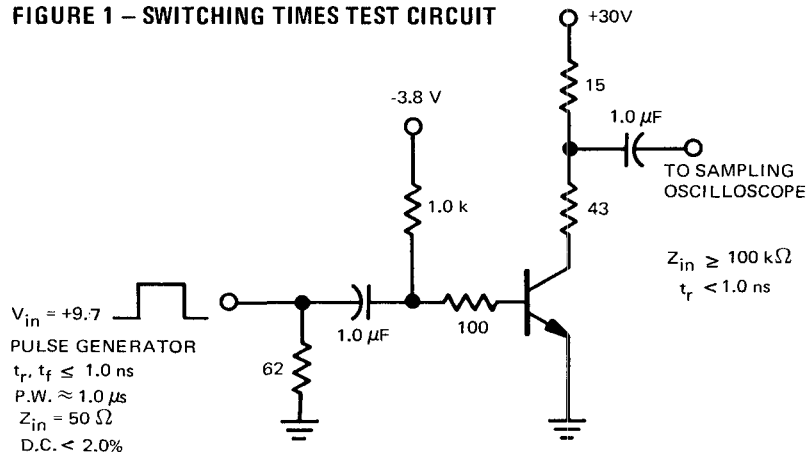
Current-Gain-Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	300	-	MHz
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 140\text{ kHz}$)	C_{ob}	-	12	pF
		-	10	
Input Capacitance ($V_{BE} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 140\text{ kHz}$)	C_{ib}	-	55	pF

SWITCHING CHARACTERISTICS

Turn-On Time	$(V_{CC} = 30\text{ Vdc}$, $V_{BE(off)} = 3.8\text{ Vdc}$, $I_C = 500\text{ mAdc}$, $I_{B1} = 50\text{ mAdc}$) (See Figure 1)	t_{on}	-	35	ns
Delay Time		t_d	-	10	ns
Rise Time		t_r	-	30	ns
Turn-Off Time	$(V_{CC} = 30\text{ Vdc}$, $I_C = 500\text{ mAdc}$, $I_{B1} = I_{B2} = 50\text{ mAdc}$) (See Figure 1)	t_{off}	-	60	ns
Storage Time		t_s	-	50	ns
Fall Time		t_f	-	25	ns
				30	ns

* Pulse Test: Pulse Width = 300 μs , Duty Cycle = 1.0%.

FIGURE 1 — SWITCHING TIMES TEST CIRCUIT



RF POWER TRANSISTORS

(Listed in order of operating test frequency and power output)

ALL SILICON NPN

Type	f MHz	P _{out} W	@	P _{in} W
2N3295	30	0.3		0.012
2N3296	30	3.0		0.075
2N3297	30	12		1.2
2N2948	30	15		2.0
2N2951, 52	50	0.6		0.1
2N2949, 50	50	3.5		0.35
2N2947	50	15		2.0
2N3950	50	50		4.5
2N3298	80	0.1		-
2N3375	100	7.5		1.0
2N3818	100	15		3.0
2N3553	175	2.5		0.25
2N3961	175	4.0		0.5
2N3924	175	4.0		1.0
2N3925	175	5.0		1.3
2N3926	175	7.0		2.0
2N3927	175	12		4.0
2N3632	175	13.5		3.5
2N3137	250	0.7		0.1
2N3664	250	2.2		0.4
2N3866	400	1.0		0.1
2N3948	400	1.0		0.25
2N4012	400	3.0 (typ)		1.0
2N3375	400	3.0 (min)		1.0
2N3733	400	10		4.0

HIGH-VOLTAGE TRANSISTORS

Type	V _{CEO}	f _T (MHz)		@	I _C mA
		min	max		
2N4924	100	100	500		20
2N4925	150	100	500		20
2N4926	200	30	300		10
2N4927	250	30	300		10

2N3733 (SILICON)

$V_{CEO} = 40 \text{ Vdc}$
 $P_{out} = 10 \text{ W @ 400 MHz}$
 $\eta = 45 \text{ min @ 400 MHz}$



NPN silicon transistor designed for amplifier, frequency multiplier, and oscillator applications.

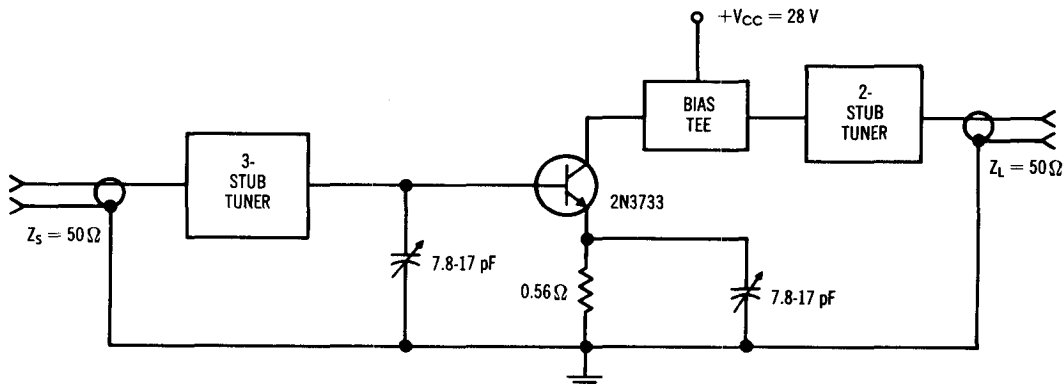
CASE 36 (TO-60)

stud isolated from case

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Emitter Voltage ($V_{EB}(\text{off}) = 1.5 \text{ Vdc}$)	V_{CEV}	65	Vdc
Collector-Base Voltage	V_{CB}	65	Vdc
Emitter-Base Voltage	V_{EB}	4	Vdc
Collector Current	I_C	3	Amps
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	23 0.13	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

FIGURE 1 — 400-MHz TEST CIRCUIT



2N3733 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage* ($I_C = 0$ to 200 mA dc, $I_B = 0$)	BV_{CEO}^*	40	-	-	Vdc
Collector-Emitter Breakdown Voltage* ($I_C = 0$ to 200 mA dc, $V_{EB(off)} = 1.5$ Vdc)	BV_{CEV}^*	65	-	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.5$ mA dc, $I_E = 0$)	BV_{CBO}	65	-	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.25$ mA dc, $I_C = 0$)	BV_{EBO}	4	-	-	Vdc
Collector Cutoff Current ($V_{CE} = 30$ Vdc, $I_B = 0$)	I_{CEO}	-	-	0.25	mA dc

ON CHARACTERISTICS

Collector-Emitter Saturation Voltage ($I_C = 500$ mA dc, $I_B = 100$ mA dc)	$V_{CE(sat)}$	-	-	1	Vdc
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DYNAMIC CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 150$ mA dc, $V_{CE} = 28$ Vdc, $f = 100$ MHz)	f_T	-	400	-	MHz
Output Capacitance ($V_{CB} = 30$ Vdc, $I_E = 0$)	C_{ob}	-	-	20	pF
Collector-Case Capacitance	C_s	-	-	6	pF
Base-Spreading Resistance ($I_C = 250$ mA dc, $V_{CE} = 28$ Vdc, $f = 200$ MHz)	r_{bb}'	-	6.5	-	Ohms

FUNCTIONAL TEST

Power Output	$V_{CE} = 28$ Vdc, $P_{in} = 4$ W, $f = 260$ MHz	P_{out}	-	14.5	-	Watts
Efficiency		η	-	60	-	%
Power Output	$V_{CE} = 28$ Vdc, $P_{in} = 4$ W, $f = 400$ MHz (Figure 1)	P_{out}	10	-	-	Watts
Efficiency		η	45	-	-	%

*Pulsed through a 25 mH inductor; duty cycle = 50%