Q17-Mini 3.0 Power Transistors Selection Table

Pair of transistors for the driver stage.

Minimum Vds = 150V, same Vgs(th) range (4V), close transductance (Gfs)

Q7 v1.4.6

			Minimum default config								Caculated (RCiss filter)				Final resistor values (scope)							
Config D1	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
	Q5	P	EOL	FQP3P20	6	1.23	190	100		8,38	104,7		8		100		8				Yes	Original config
	Q6	N	EOL	FQP3N30	7	1.75	75		100	21,22		265,25	8			120	8					

Config D2	TESTED OK		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
	Q5	P		FQPF7P20	25	3.5	770	100		2,06	93,95		2,2		100		2,2				Yes	
	Q6	N	EOL	2SK3564	17	2.6	700		100	2,27		103,34	2,2			100	2,2					

Config D3	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
	Q5	P		FQPF7P20	25	3.5	770	100		2,06	93,95		2,2		100		2,2				Yes	
	Q6	N		FQPF3N80C	16.5	3	705		100	2,25		108,55	2,2			100	2,2					Overshoot with config S2.

Config D4	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
	Q5	P		IRF9610	11	0.9	170	100		9,36	98,54		9,5		100		9				Yes	The square signals are a little less nice
	Q6	N		IRF610	8.2	0.8	140		100	11,36		119,66	9,5			100	9					than with D2 configurations.

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
	Q5	P		IRFI9620G	15	1,3	340	100		4,68	99,59		4,7									
	Q6	N		IRFI620G	14	1.5	260		100	6,12		130,24	4,7									

Pair of transistors for the output stage.

Minimum Vds = 150V, same Vgs(th) range (4V), close transductance (Gfs) and Qg.

Config S1	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment	Subjective sound review
	Q15	N		FQA46N15	110	36	2500	330		192,92	335,06		190		330		190		9.1	0,011	90,9	Yes	Original config	Good sound.
	Q16	P	n.a	FQA36P15	105	19.5	2550		330	189,13		328,49	190			330	190							Well balanced sound.

Config S2	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment	Subjective sound review
	Q15	N		FQA46N15	110	36	2500	330		192,92	335,06		190		330		190		9.1	0,017	88,2	No	Q14=3.6V, Q16=-3.8V - Bad spectrum.	Good sound.
	Q16	P		IXTH48P20P	103	32	5400		330	89,31		155,12	190			150	190						With R10/R13=8R2 consume 400mA.	Low frequency drier than S5.

Config S3	TO TEST		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment	Subjective sound review
	Q15	N		IXTQ50N20P	70	23	2720	330		177,31	307,96		190						9.1				48v max.	
	Q16	P		IXTQ52P10P	60	20	2845		330	169,52		294,43	190										Good to try at 35-40V.	

Config S4	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment	Subjective sound review
	Q15	N		IXTQ36N30P	70	22	2250	330		214,35	372,29		190		374		190		8.2	0,022	87.2 dB	No	Q14=3.6V, Q16=-3.8V	Good sound.
	Q16	P		IXTQ36P15P	55	19	3100		330	155,57		270,21	190			270	190						With R10/R13=9R1 ou 8R2 - Bad spectrum.	Low frequency less controlled than S5.

Config S5	TESTED OK		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment	Subjective sound review
	Q15	N		FQA46N15	110	36	2500	330		192,92	335,06		190		330		190		8.2	0,011	91,1	Yes	Q15/Q16 well balanced (3.6V).	Good sound.
	Q16	P		IXTQ36P15P	55	19	3100		330	155,57		270,21	190			330	285						With R10/R13=8R2. Good spectrum.	Well balanced sound.

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment
	Q15	N		IXTQ50N20P	70	23	2720	330		177,31	307,96		190						9.1				
	Q16	P		IXTQ36P15P	55	19	3100		330	155,57		270,21	190										

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment
	Q15	N		IXFH50N85X	152	32	4480	330		107,65	186,97		190						9.1				
	Q16	P		IXTH48P20P	103	32	5400		330	89,31		155,12	190										

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment
	Q15	N		IRFP240	70	6.9	1300	330		370,99	644,35		190						9.1				
	Q16	P		IRFP9240	44	9.4	1200		330	401,90		698,04	190										

	SIM NOT WORKING		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment
	Q15	N		ECX10N20		1	500	330		964,57	1675,31		190						9.1				
	Q16	P		ECX10P20		1.5	500		330	964,57		1675,31	190										

	SIM NOT WORKING		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R14	R15	Freq KHz	R14	R15	Freq KHz		R14	R15	Freq KHz		R10-R13 (R)	THD %	SNR -dBuA	OK	Comment
	Q15	N		ECW20N20		8	900	330		535,87	930,73		190						9.1				
	Q16	P		ECW20P20		3	1850		330	267,93		452,78	190										

Pair of transistors for op-amp power supply

Minimum Vds = 60V, same Vgs(th) range (4V)

Config A1	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
	Q1	N		IRF610	8.2	0.8	140	100		11,36	126,31		9		100		9				Yes	Original config
	Q4	P		IRF9610	11	0.9	170		100	9,36		104,02	9			100	9				Yes	

Config A2	TESTED (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
	Q1'	N		Si2308BDS	6.8	5	190	100		8,37	104,70		8		100		8				Yes	Need 16V zener instead of 18V to got 13.5V.
	Q4'	P		Si2309CDS	4.1	2.8	210		100	7,57		94,73	8			100	8					Source-Gate = 2.15V

Config A3	TO TEST (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
	Q1'	N		DMN6075SQ	12.3	n.a	606	100		2,62	100,34		2,6		100		2,6					
	Q4'	P		DMPH6250S	4	n.a	512		100	3,10		119,55	2,6			120	2,6					

Config A4	TO TEST (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
	Q1'	N		SI2328DS	5	4	150	100		10,61	350		3									
	Q4'	P		SI2325DS	12	2.2	510		100	3,12		100	3									