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 v1.4.7

	Minimum default config										Calculated (RCiss filter)				Final resistor values (scope)						
	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
Config D1	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					
	TESTED OK		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
Config D2	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					
	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
Config D3	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.
	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R7	R8	Freq MHz	R7	R8	Freq MHz		R7	R8	Freq MHz				OK	Comment
Config D4	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.

	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
Config S1	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.
	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
Config S2	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.
	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
Config S3	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.	
	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
Config S4	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.
	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
Config S5	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)

	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
Config A1	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					
	TESTED OK (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
Config A2	Q1'	N		Si2308BDS	6.8	5	190	100		8,37	104,70		8		100		8				Yes	Need 16V zener 1N5246B to get 13.5V.
	Q4'	P		Si2309CDS	4.1	2.8	210		100	7,57		94,73	8			100	8					Source-Gate = 2.15V
	TESTED (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz				OK	Comment
Config A3	Q1'	N		DMN6075SQ	12.3	n.a	606	100		2,62	100,34		2,6		100		2,6				Yes	Need 16V zener 1N5246B to get 13.5V.
	Q4'	P		DMPH6250S	4	n.a	512		100	3,10		119,55	2,6			100	2,6					Source-Gate = 1.6V
	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
Config A4	Q1'	N		SI2328DS	5	4	150	100		10,61	350		3									
	Q4'	P		Si2325DS	12	2.2	510		100	3,12		100	3									