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 v1.5.1

	Minimum default config											Caculated (RCiss filter)				Final resistor values (scope)							
	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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			255	8					

	TESTED OK		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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					Oscillation at 32V output with Q17-Turbo & S5.

	TESTED OK		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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	Good with Q17-Turbo v2 & S5
	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	Vgs Volt	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			120	9					than with D2 configurations.

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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), Vgs(th) = loaded @ 18V170mA

	DEFAULT		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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	EOL	FQA46N15	110	36	2500	4.1	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	3.7		330	189,13		328,49	190			330	190						Well balanced sound.

	TESTED		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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	EOL	FQA46N15	110	36	2500	4.1	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	4.2		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	Vgs Volt	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	Vgs Volt	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	4.8	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	4.1		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	Vgs Volt	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	EOL	FQA46N15	110	36	2500	4.1	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	4.1		330	155,57		270,21	190			270	190					With R10/R13=8R2. Good spectrum.	Well balanced sound.

	CANDIDATE		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	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	Vgs Volt	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	Vgs Volt	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	Vgs Volt	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	Vgs Volt	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	Vgs Volt	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz	Zener Volt			OK	Comment
Config A1	Q1	N		IRF610	8.2	0.8	140		100		11,36	126,31		9		100		9	18			Yes	Original config
	Q4	P		IRF9610	11	0.9	170			100	9,36		104,02	9			100	9					

	TESTED (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz	Zener Volt			OK	Comment
Config A2	Q1'	N		Si2308BDS	6.8	5	190		100		8,37	104,70		8		100		8	16			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	Vgs Volt	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz	Zener Volt			OK	Comment
Config A3	Q1'	N		DMN6075SQ	12.3	n.a	606		100		2,62	100,34		2,6		100		2,6	16			Yes	Need 16V zener 1N5246B to get 13.5V.
	Q4'	P		DMPH6250S	4	n.a	512			100	3,10		119,55	2,6			100	3					Source-Gate = 1.6V

	TESTED OK (SMD)		Status	Parts	Qg nC	Gfs Sie	Ciss pF	Vgs Volt	R40	R41	Freq MHz	R40	R41	Freq MHz		R40	R41	Freq MHz	Zener Volt			OK	Comment
Config A4	Q1'	N		SI2328DS	5	4	150		100		10,61	350		3		100		10	15			Yes	Need 15V zener 1N5245B to get 13V.
	Q4'	P		SI2325DS	12	2.2	510			100	3,12		100	3			100	3					Source-Gate = 1.6V