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Oakley Modular Systems

Documented by Tom Farrand • Radio-Flier Electronics • Updated August 20, 2002

Qty	Mfgr. Name	Manufacturer's Part Number	Part Description	Schematic Reference	Vendor	Vendor Stock #	Each	Total
9	Xicon	271-10K	10K ¼W 1% resistor 50 ppm	R79, R84, R86, R87, R88, R89, R91, R95, R98	Mouser	271-10K	0.09	0.81
6	Xicon	271-47K	47K ¼W 1% resistor 50 ppm	R67 ¹ , R68 ¹ , R100, R101, R102, R111	Mouser	271-47K	0.09	0.54
5	Xicon	271-68K	68K ¼W 1% resistor 50 ppm	R62, R71, R72, R110, R106	Mouser	271-68K	0.09	0.45
5	Xicon	271-1K	1K ¼W 1% resistor 50 ppm	R59, R60, R64, R65, R66	Mouser	271-1K	0.09	0.45
4	Xicon	271-22	22Ω ¼W 1% resistor 50 ppm	R63, R69, R75, R96	Mouser	271-22	0.09	0.36
3	Xicon	271-100K	100K ¼W 1% resistor 50 ppm	R90, R94, R103	Mouser	271-100K	0.09	0.27
3	Xicon	271-4.7K	4.7K ¼W 1% resistor 50 ppm	R97, R99, R113	Mouser	271-4.7K	0.09	0.27
3	Xicon	271-15K	15K ¼W 1% resistor 50 ppm	R68 ¹ , R78, R83	Mouser	271-15K	0.09	0.27
2	Xicon	271-22K	22K ¼W 1% resistor 50 ppm	R107, R109	Mouser	271-22K	0.09	0.18
2	Xicon	271-2.2K	2.2K ¼W 1% resistor 50 ppm	R104, R114	Mouser	271-2.2K	0.09	0.18
2	Xicon	271-27K	27K ¼W 1% resistor 50 ppm	R105, R112	Mouser	271-27K	0.09	0.18
2	Xicon	271-33K	33K ¼W 1% resistor 50 ppm	R77, R82	Mouser	271-33K	0.09	0.18
2	Xicon	271-470K	470K ¼W 1% resistor 50 ppm	R80, R85	Mouser	271-470K	0.09	0.18
2	Xicon	271-680K	680K ¼W 1% resistor 50 ppm	R61, R74	Mouser	271-680K	0.09	0.18
1	Xicon	271-1.5K	1.5K ¼W 1% resistor 50 ppm	R67 ¹	Mouser	271-1.5K	0.09	0.09
1	Xicon	271-47	47Ω ¼W 1% resistor 50 ppm	R76	Mouser	271-47	0.09	0.09
1	Xicon	271-150K	150K ¼W 1% resistor 50 ppm	R70	Mouser	271-150K	0.09	0.09
1	Xicon	271-200K	200K ¼W 1% resistor 50 ppm	R92	Mouser	271-200K	0.09	0.09
1	Xicon	271-270K	270K ¼W 1% resistor 50 ppm	R73	Mouser	271-270K	0.09	0.09
1	Xicon	271-390K	390K ¼W 1% resistor 50 ppm	R81	Mouser	271-390K	0.09	0.09
1	Xicon	271-1.0M	1.0M ¼W 1% resistor 50 ppm	R108	Mouser	271-1.0M	0.09	0.09
1	Xicon	291-2.2M	2.2M ¼W 5% resistor	R93	Mouser	291-2.2M	0.07	0.07

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3	Piher	PTC10V-100K	100K 10mm Cermet trimpot	Center, Off-1, Off-2	Mouser	531- PTC10V-100K	0.45	1.35
2	Omeg	BR16ECO-22KA	22K linear pot w/bracket	"Gain CV Depth", "Fold CV Depth"	OMS	WaveFolder Pot Kit	1.93	3.86
2	Omeg	BR16ECO-47KA	47K linear pot w/bracket	"Gain", "Fold"	OMS	WaveFolder Pot Kit	1.93	3.86
1	Omeg	BR16ECO-10KB	10K log pot w/bracket	"Output"	OMS	WaveFolder Pot Kit	1.93	1.92
2	Omeg	BR16ECO-100KA	100K linear pot w/bracket	"Threshold", "Thresh. CV Depth"	OMS	WaveFolder Pot Kit	1.93	3.86
						Pot kit (£ 9.00)	13.50	
6	Panasonic	EEU-FC1V220	22 uf 35V FC-series electrolytic capacitor	C17, C18, C19, C20, C23, C28 ²	Digikey	P11230-ND	0.46	2.76
1	Panasonic	EEU-FC1V470	47 uf 35V FC-series electrolytic capacitor	C22 ²	Digikey	P11232-ND	0.51	0.51
1	Mallory	CK05151K	150 pf @ 200V ceramic	C26	Mouser	539-CK05151K	0.34	0.34
1	Mallory	CK05180K	18 pf @ 200V ceramic	C25	Mouser	539-CK05180K	0.41	0.41
1	Mallory	CK05100K	10 pf @ 200V ceramic	C21 ³	Mouser	539-CK05100K	0.34	0.34
2	Panasonic	ECH-S1H102JZ	1000 pf @ 50V PPS film 5% capacitor	C29, C30	Digikey	PS1H102J-ND	0.35	0.70
2	Vishay	MKT1826410064	0.1 uf @ 63V polyester film 5% capacitor	C24, C27	Mouser	75-MKT1826410064	0.21	0.42
3	Fairchild	1N4148	1N4148 Silicon diode	D7, D8, D10	Mouser	512-1N4148	0.05	0.15
2	Diodes	1N5231B	5.1V 5% Zener 500 mw	D5, D6	Digikey	1N5231BDICT-ND	0.36	0.72
1	Diodes	1N5240B	10V 5% Zener 500 mw	D9	Digikey	1N5240BDICT-ND	0.36	0.36
1	Fairchild	BC550C or 2N3904	BC550C NPN low noise transistor (2N3904-pinout!) ⁴	Q3	Mouser	512-BC550C or 512-2N3904	0.07 0.11	0.07 0.11
2	Fairchild	BC560C or 2N3906	BC560C PNP low noise transistor (2N3906-pinout!) ⁴	Q4, Q5	Mouser	512-BC560C or 512-2N3906	0.07 0.08	0.14 0.16
1	Intersil	CA3280E	CA3280E dual OTA 16-pin DIP	U10	Future-Active	CA3280E	4.05	4.05

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Qty	Mfgr. Name	Manufacturer's Part Number	Part Description	Schematic Reference	Vendor	Vendor Stock #	Each	Total
5	T.I.	TL072ACP	TL072 dual opamp 8-pin DIP	U8, U9, U11, U13, U15	Mouser	595-TL072ACP	0.74	3.70
1	Intersil	DG403DJ	DG403DJ Dual IC-switch	U14	Future-Active	DG403DJ	2.99	2.99
1	STM	LM311N	LM311 Voltage Comparator DIP-8	U12	Mouser	511-LM311N	0.24	0.24
1	Panasonic	LN21CAL(US)-2	Red LED (see Oakley text)	LED ⁵	Digikey	P406-ND	0.39	0.39
2	Fair-Rite	2743002112	Ferrite Bead – broadband #43 material	L1, L2	Mouser	623-2743002112	0.12	0.24
1	Molex	MTA-156	MTA-156 power entry	PWR	Mouser	571-6404454	0.11	0.11
1	NKK	M2012ES1W01	SPDT Switch	POL ⁶	Digikey	360-1043-ND	5.40	5.40
7	Tyco/ Alco	PKES-90B-1/4	Knob with pointer stripe	GAIN, GAIN CV, THRESHOLD, THRESH CV, FOLD, FOLD CV, OUTPUT	Various	-	1.50	10.50
9	Switchcraft	112A	¼" phone jack with closed circuit	EXT, IN, GAIN, THRESH, FOLD, MAIN OUT, SOFT OUT, CLAMP OUT, CLIP OUT	Mouser	502-112A	1.44	12.96

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Notes:

- 1 Resistors R67 and R68 can each be one of two values. This parts list shows entries for both values of R67 and R68. Please consult the Oakley documentation for choosing which values of these resistors you should install.
- 2 The Panasonic capacitor specified is much more expensive than those commonly used and specified elsewhere. In fact, these are about ten times more expensive! The capacitors I specified are low-ESR types with a high temperature rating, a higher voltage rating, and probably a lot longer life. Electrolytic capacitors are likely the first component to “age”. Therefore, I wanted a part that would age gracefully over a much longer time span. Use the nickel variety if you must, but it seems silly to chintz on capacitors and then use 1% tolerance 50-PPM resistors! By the way, the PC board is laid out for a capacitor lead spacing of 5 mm. All of the capacitors I could find in that value had an actual lead spacing of 2.0 mm. So fitting the caps to the board will require a bit of lead bending to make them fit properly.
- 3 The Oakley specified value for capacitor C21 is 4.7 pf. I was unable to find a *quality* part in this value and substituted a 10 pf part instead. That component value change should have a negligible effect on the frequency/pulse response of the WaveFolder. One could always eliminate the part with little or no effect or simply stick insulated wires in the cap holes on the PC board and twist them together about 4 turns. That is pretty much a 4.7 pf capacitor!
- 4 2N3904 and 2N3906 transistors may be substituted for the BC550 and BC560 transistors, respectively. **Note:** The 2N390x parts use a different pinout than the BC5x0 counterparts. When looking at the flat side of a **2N390x** and the leads point down, the pins (left-to-right) are **E-B-C**. When looking at the flat side of a **BC5x0** and the leads point down, the pins (left-to-right) are **C-B-E**. Install the transistor you buy accordingly!
- 5 The LED is only needed if you want another kind of distortion from your WaveFolder. Otherwise the LED is unneeded. Please review the Oakley documentation to help you make a decision on this.
- 6 The specified switch is the “expensive” one used on MOTM standard modules. If a consistent look is not that important then some other, less expensive switch will suffice. But if you want the real deal, you will have to pay for it!

The total cost of the components listed herein is \$68.36 at the time of writing. This does not account for quantity purchases.

Digikey = www.digikey.com

Mouser = www.mouser.com

OMS = www.oakleysound.com

Future = www.future-active.com