Coaxial

Amplifier

ZFL-500+

50Ω Low Power 0.05 to 500 MHz

Generic photo used for illustration purposes only

CASE STYLE: Y460

Connectors	Model
SMA	ZFL-500+
BNC	ZFL-500-BNC+
BRACKET (OPTION "B")	

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Features

- wideband, 0.05 to 500 MHz
- rugged, shielded case
- low noise, 4.2 dB typ.
- protected by US Patent, 6,943,629

Applications

- instrumentation
- lab use
- VHF/UHF

Amplifier Electrical Specifications

MODEL NO.	FREQUENCY (MHz)		GAIN (dB)			MAXIMUM POWER (dBm)		DYNAMIC RANGE		VSWR* (:1) Typ.		DC POWER	
						Output (1 dB Compr.)	Input	NF (dB)	IP3 (dBm)			Volt (V)	Current (mA)
	f_L	f_U	Min.	Typ.	Flatness Max.	Min.	(no damage)	Typ.	Typ.	In	Out	Nom.	Max.
ZFL-500+	0.05	500	20	25	±1.0	+9	+5	4.2	+25	1.3	1.3	15	80

Open load is not recommended, potentially can cause damage.
With no load derate max input power by 20 dB
*VSWR may increase to 1.8 below 0.1 MHz

3 mW
→ 0.4 V (into 50Ω)

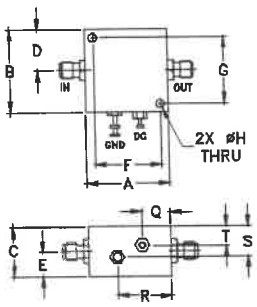
Maximum Ratings

Operating Temperature	-20°C to 71°C
Storage Temperature	-55°C to 100°C
DC Voltage	+17V Max.

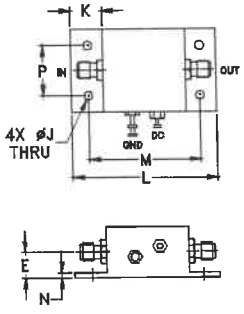
Permanent damage may occur if any of these limits are exceeded.

Outline Drawing

STANDARD



OPTION "B"

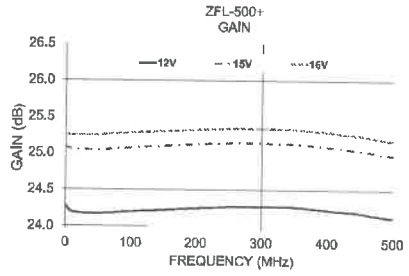


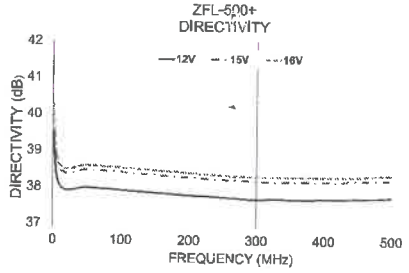
Outline Dimensions (inch / mm)

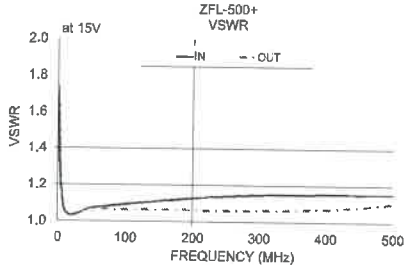
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt.
1.25	1.25	.75	.63	.36	1.000	1.000	.125	.125	.46	2.18	1.688	.06	.750	.50	.80	.45	.29	grams
31.75	31.75	19.05	16.00	9.14	25.40	25.40	3.18	3.18	11.68	55.37	42.88	1.52	19.05	12.70	20.32	11.43	7.37	38

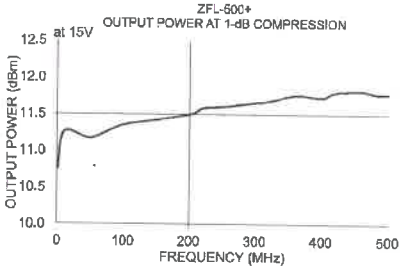
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

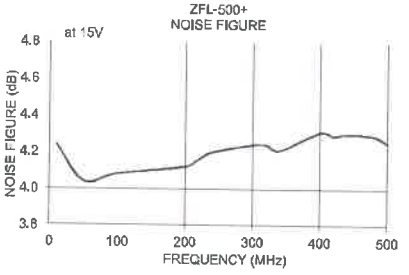
FREQUENCY (MHz)	GAIN (dB)			DIRECTIVITY (dB)			VSWR (:1) 15V		NOISE FIGURE (dB)	POUT at 1 dB COMPR. (dBm)
	12V	15V	16V	12V	15V	16V	IN	OUT	15V	15V
0.05	24.28	25.08	25.25	39.45	40.09	40.25	1.73	1.74	—	10.75
10.00	24.19	25.06	25.25	38.02	38.50	38.61	1.06	1.07	4.24	11.26
50.00	24.17	25.05	25.25	37.97	38.47	38.58	1.07	1.07	4.04	11.17
100.00	24.20	25.08	25.28	37.91	38.41	38.53	1.09	1.07	4.08	11.35
200.00	24.25	25.13	25.32	37.78	38.28	38.40	1.13	1.06	4.12	11.49
225.00	24.26	25.14	25.33	37.76	38.26	38.37	1.14	1.06	4.16	11.58
250.00	24.27	25.15	25.34	37.73	38.23	38.34	1.14	1.06	4.20	11.61
300.00	24.27	25.15	25.34	37.68	38.19	38.31	1.15	1.06	4.24	11.66
325.00	24.27	25.14	25.34	37.70	38.19	38.30	1.15	1.07	4.24	11.68
350.00	24.27	25.14	25.33	37.68	38.19	38.31	1.15	1.07	4.21	11.76
400.00	24.23	25.10	25.30	37.69	38.19	38.31	1.15	1.07	4.31	11.73
425.00	24.21	25.08	25.27	37.70	38.19	38.31	1.15	1.08	4.29	11.80
450.00	24.19	25.05	25.25	37.71	38.21	38.32	1.15	1.08	4.30	11.82
475.00	24.15	25.02	25.21	37.72	38.23	38.35	1.15	1.09	4.29	11.78
500.00	24.12	24.98	25.18	37.75	38.24	38.36	1.15	1.10	4.25	11.78











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MITEQ AU1114

BIPOLAR AMPLIFIERS

GENERAL SPECIFICATIONS

The following specifications are applied to all models within this catalog:

POWER SUPPLY VARIATIONS

Most amplifiers include internal voltage regulators and reverse voltage protection diodes. They can, therefore, operate with an input voltage range from +15 V to +30 V and survive connection to a negative power supply without damage.

TEMPERATURE RANGES

All specifications are guaranteed at +23°C. All small signal amplifiers are guaranteed to operate over a temperature range of -25 to +75°C with slightly degraded performance. Storage temperature for all models is -40 to +85°C. MITEQ will accept requirements for guaranteed electrical performance over this and other extended temperature ranges. Medium power and power amplifiers usually have a more restrictive upper temperature range. Guaranteed temperature specifications for power amplifiers vary by model.

HEATSINKING

All power and medium power amplifiers (output power greater than +23 dBm) require adequate heatsinking. If your application does not allow for a mechanical heatsink, please contact MITEQ and request that one be supplied with the unit.

CONNECTORS

All models are supplied with SMA-female connectors. SMA-male, BNC-female, N-male and N-female are optionally available for outlines 1 through 5, 12, 13 and 15. Connectors may be mixed. Please call with your specific connector requirements.

STABILITY

All amplifiers are guaranteed to be unconditionally stable. Small signal amplifiers may be operated into any source or load impedance without damage. Power and medium power amplifiers must be terminated in 50 ohms at all times.

SECOND AND THIRD ORDER INTERCEPT POINTS

The third order intercept point is typically 10 dB above the 1 dB compression point for most models. The second order intercept point is typically 20 dB above the 1 dB compression point.

MAXIMUM INPUT SIGNAL LEVELS

20mW → 1V (into 50Ω)

The maximum input power level for survival without damage is +13 dBm CW. Most designs to 500 MHz can be modified to include an input limiter for protection up to 1 watt CW.

ENVIRONMENTAL SPECIFICATIONS

Humidity.....Up to 95% at 40° noncondensing
Vibration.....1.0–3.0 g's rms, 5 Hz–50 kHz random, basic transportation, secured cargo, MIL-STD-810E, Method 514, Procedure 1

AMPLIFIERS BY FREQUENCY (CONT.)

FREQUENCY (MHz)	MODEL NUMBER	GAIN (dB) (Min.)	VAR. (±dB) (Max.)	VSWR (Max.)	IMPED. IN/OUT (Ohms)	NOISE FIGURE (dB, Max.) F_1	F_0	F_2	P1 dB (dBm) (Min.)	VOLTS	NOM. DC POWER (mA)	OUTLINE NO.
10 – 300	AUP-1382	40	1.5	2.0:1	50/50	2.4	2.5	2.7	29	21	630	13
10 – 300	AUP-1383	35	1.5	2.0:1	50/50	2.4	2.5	2.7	29	21	650	13
10 – 400	AU-1448	50	0.5	2.0:1	50/50	1.2	1.2	1.3	10	15	70	3
10 – 500	AU-1102	11	0.5	2.2:1	50/50	1.7	1.9	2.2	-5	15	18	7
10 – 500	AU-1114	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	55	2
10 – 500	AU-1301	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	50	2
10 – 500	AU-1313	44	0.5	2.0:1	50/50	1.3	1.4	1.5	10	15	70	3
10 – 500	AU-1327	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	50	8
10 – 500	AU-1372	7	0.5	2.0:1	50/50	8.0	8.0	8.0	13	15	65	1
10 – 500	AU-1426	11	0.5	2.0:1	50/50	1.6	1.8	2.0	-6	15	20	1
10 – 500	AU-1611	14	0.5	2.0:1	50/50	2.8	2.9	3.0	9	15	40	1
10 – 500	AUP-1374	30	1.0	1.5:1	50/50	4.8	5.0	5.5	29	21	550	13
10 – 500	AUP-1542	45	1.0	2.0:1	50/50	3.0	3.0	3.0	29	21	550	13
10 – 600	AU-1467	60	0.75	2.0:1	50/50	1.3	1.4	1.5	9	15	95	4
10 – 1000	AM-1571	38	0.75	2.0:1	50/50	1.4	1.6	1.8	17	15	225	3
10 – 1000	AMP-1380	21	1.5	2.0:1	50/50	6.5	6.8	7.3	28	21	625	13
10 – 1000	AMP-1389	13	1.0	2.0:1	50/50	10.0	10.0	10.0	28	21	525	13
20 – 180	AU-1214	15	0.5	2.0:1	50/50	4.5	4.5	4.5	17	15	85	10
20 – 200	AU-1127	29	0.25	2.0:1	75/75	1.3	1.3	1.3	7	15	50	2
20 – 200	AU-1158	30	0.5	2.0:1	50/50	2.9	2.9	2.9	17	15	125	3
20 – 200	AU-1204	50	0.5	2.0:1	50/50	2.0	2.1	2.2	18	15	130	3
20 – 200	AU-2A-1376	30	0.5	2.0:1	50/50	2.7	2.7	2.7	17	15	125	10
20 – 1000	AM-1326	26	0.75	2.0:1	50/50	3.2	3.5	3.8	15	15	160	8
20 – 1000	AM-1430	31	0.75	2.0:1	50/50	1.7	1.8	2.0	15	15	140	3
20 – 2500	AM-1618	21	1.0	2.0:1	50/50	3.2	3.5	4.0	10	15	60	1
20 – 3000	AM-1367	38	1.25	2.2:1	50/50	6.0	6.0	6.0	16	15	260	3
25 – 1500	AM-1372-1500	7	1.0	2.0:1	50/50	7.0	7.0	7.0	10	15	65	1
30 – 500	AU-1340	35	0.5	2.0:1	50/50	2.0	2.2	2.4	20	15	240	3
50 – 90	AU-1001	15	0.25	1.3:1	75/75	5.0	5.0	5.0	18	15	65	10
50 – 90	AU-1006-70	30	0.2	1.5:1	50/50	1.3	1.3	1.3	8	15	50	2
50 – 90	AU-1021-70	24	0.2	1.5:1	50/50	2.5	2.5	2.5	20	15	175	2
50 – 90	AU-1027-70	44	0.2	1.5:1	50/50	1.4	1.4	1.4	10	15	75	3
50 – 90	AU-1046-70	19	0.2	1.5:1	50/50	2.5	2.5	2.5	10	15	40	1
50 – 90	AU-1049-70	14	0.2	1.5:1	50/50	2.7	2.7	2.7	10	15	40	1
50 – 90	AU-1093-70	32	0.2	1.5:1	50/50	3.0	3.0	3.0	18	15	135	3
50 – 90	AU-1127-70	29	0.2	1.5:1	75/75	1.3	1.3	1.3	7	15	55	2
50 – 90	AU-1138-70	29	0.2	1.5:1	75/75	3.0	3.0	3.0	20	15	125	3
50 – 90	AU-1147-70	30	0.2	1.5:1	50/75	3.2	3.2	3.2	20	15	125	3
50 – 90	AU-1149-70	15	0.2	1.5:1	75/75	5.0	5.0	5.0	19	15	85	2
50 – 90	AU-1158-70	30	0.2	1.5:1	50/50	2.9	2.9	2.9	20	15	125	3
50 – 90	AU-1204-70	52	0.2	1.5:1	50/50	2.0	2.0	2.0	20	15	130	3
50 – 90	AU-1263-70	43	0.2	1.5:1	50/50	1.5	1.5	1.5	20	15	140	4
50 – 90	AU-1360-70	45	0.2	1.5:1	75/75	2.0	2.0	2.0	20	15	140	4
50 – 90	AU-1362-70	15	0.25	1.5:1	50/50	4.0	4.0	4.0	20	15	80	2
50 – 90	AU-1372-70	7	0.2	1.5:1	50/50	8.0	8.0	8.0	13	15	65	1
50 – 90	AU-1376	30	0.25	1.3:1	50/50	2.7	2.7	2.7	20	15	125	10
50 – 90	AU-1415-70	44	0.25	1.5:1	50/50	1.4	1.4	1.4	20	15	140	4
50 – 90	AU-1440-70	13	0.25	1.5:1	75/75	8.0	8.0	8.0	23	15	230	15-2
50 – 90	AU-1447-70	56	0.25	1.5:1	50/50	1.2	1.2	1.2	12	15	75	3
50 – 90	AU-1459-70	26	0.2	1.5:1	50/50	3.0	3.0	3.0	14	15	130	3
50 – 90	AU-1466-70	35	0.25	1.5:1	50/50	1.2	1.2	1.2	7	15	45	2
50 – 90	AU-1469-70	28	0.2	1.5:1	50/50	7.5	7.5	7.5	15	15	240	3
50 – 90	AU-1494-70	56	0.25	1.5:1	50/50	1.2	1.2	1.2	12	15	70	3
50 – 90	AU-1499-70	22	0.2	1.5:1	50/50	4.0	4.0	4.0	20	15	170	3
50 – 90	AU-1510-70	13	0.2	1.5:1	50/50	7.0	7.0	7.0	23	15	250	2
50 – 90	AU-1538-70	13	0.2	1.5:1	50/50	7.0	7.0	7.0	17	15	165	2
50 – 90	AU-1552-70	10	0.25	1.5:1	75/75	4.5	4.5	4.5	20	15	85	1
50 – 90	AU-1571-70	38	0.20	1.5:1	50/50	1.3	1.3	1.3	18	15	225	3
50 – 90	AU-1574-70	12	0.25	1.5:1	75/75	4.5	4.5	4.5	18	15	85	1
50 – 90	AU-1576-70	12	0.25	1.3:1	75/50	9.0	9.0	9.0	13	15	180	2
50 – 90	AU-1612-70	28	0.2	1.5:1	50/50	2.0	2.0	2.0	20	15	150	2
50 – 90	AU-1A-1046	19	0.25	1.3:1	50/50	2.5	2.5	2.5	10	15	40	1
50 – 90	AU-1A-1049	14	0.25	1.3:1	50/50	2.8	2.8	2.8	10	15	40	1
50 – 90	AU-2A-1127	30	0.25	1.3:1	75/75	1.4	1.4	1.4	7	15	50	2
50 – 90	AU-2A-1138	29	0.25	1.3:1	75/75	2.9	2.9	2.9	20	15	125	3
50 – 90	AU-2A-1147	30	0.25	1.3:1	50/75	3.2	3.2	3.2	20	15	125	3
50 – 90	AU-2A-1158	30	0.25	1.3:1	50/50	2.9	2.9	2.9	20	15	125	3
50 – 90	AU-2A-1288	30	0.5	1.5:1	50/50	3.0	3.0	3.0	17	15	120	10
50 – 90	AU-2A-1360	45	0.25	1.3:1	75/75	2.0	2.0	2.0	20	15	140	4
50 – 90	AU-3A-1204	52	0.25	1.3:1	50/50	2.2	2.2	2.2	20	15	130	3
50 – 90	AU-3A-1263	43	0.25	1.3:1	50/50	1.5	1.5	1.5	20	15	135	4
50 – 90	AU-1616-70	20	0.20	1.3:1	50/50	3.2	3.2	3.2	12	15	60	1

SPECIAL APPLICATION AMPLIFIERS (CONT.)

FREQUENCY (MHz)	MODEL NUMBER	GAIN (dB) (Min.)	VAR. (±dB) (Max.)	VSWR (Max.)	IMPED. IN/OUT (Ohms)	NOISE FIGURE (dB, Max.) F_1	F_0	F_2	P1 dB (dBm) (Min.)	VOLTS	NOM. DC POWER (mA)	OUTLINE NO.
FAST RECOVERY NMR AMPLIFIERS												
0.2 – 400	AU-1583	36	0.5	2.0:1	50/50	1.2	1.2	1.2	6	15	45	2
1 – 200	AU-1579	35	0.5	2.0:1	50/50	1.2	1.2	1.2	6	15	45	2
5 – 400	AU-1322	24	0.5	2.0:1	50/50	2.5	2.5	3.3	17	15	150	2
10 – 200	AU-1466	35	0.5	2.0:1	50/50	1.2	1.2	1.2	6	15	45	2
10 – 200	AU-1480	50	0.5	2.0:1	50/50	1.2	1.2	1.2	10	15	65	3
10 – 400	AU-1448	50	0.5	2.0:1	50/50	1.2	1.2	1.3	10	15	70	3
10 – 500	AU-1611	14	0.5	2.0:1	50/50	2.8	2.9	3.0	9	15	40	1
10 – 500	AU-1327	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	50	8
10 – 500	AU-1301	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	50	2
10 – 500	AU-1114	30	0.5	2.0:1	50/50	1.3	1.4	1.5	8	15	55	2
10 – 500	AU-1313	44	0.5	2.0:1	50/50	1.3	1.4	1.5	10	15	70	3
10 – 600	AU-1467	60	0.75	2.0:1	50/50	1.3	1.4	1.5	9	15	95	4

NOTE: All NMR amplifiers have the following features:

- Input crossed diode protection.
- No internal ferrites. May be used in a high magnetic field.
- 1.0 µsec nominal recovery time after an input overload for most models.
- Nom 25 µsec nominal recovery for model AU-1583.
- Nom 10 µsec nominal recovery for model AU-1579.

These amplifiers have been designed for NMR / MRI type applications where there is a large RF pulse that occurs prior to the signal of interest. Most models will recover within one µsec after the end of the pulse. Many of the 10 MHz models are now flat down to about 3 MHz. All units have input diode limiters and can withstand an RF level of +30 dBm CW or a 10 µsec 20V p-p pulse. Most models are available with a lower frequency range but with a longer recovery time. Please contact Bill Pope at (631) 439-9115 or e-mail wpope@miteq.com with your specific requirements.

75 OHM AMPLIFIERS												
5 – 100	AU-1138	30	0.5	2.0:1	75/75	2.9	2.9	2.9	20	15	125	3
10 – 100	AU-1149	15	0.5	1.5:1	75/75	4.5	5.5	6.0	18	15	80	2
10 – 200	AU-1552	10	0.5	2.0:1	75/75	4.5	4.8	5.0	19	15	85	1
10 – 200	AU-1576	12	0.5	1.5:1	75/50	9.0	9.0	9.0	13	15	180	2
10 – 200	AU-1360	44	0.5	2.0:1	75/75	1.8	2.0	2.2	18	15	140	4
20 – 200	AU-1127	29	0.25	2.0:1	75/75	1.3	1.3	1.3	7	15	50	2
50 – 90	AU-1552-70	10	0.25	1.5:1	75/75	4.5	4.5	4.5	20	15	85	1
50 – 90	AU-1574-70	12	0.25	1.5:1	75/75	4.5	4.5	4.5	18	15	85	1
50 – 90	AU-1576-70	12	0.25	1.3:1	75/50	9.0	9.0	9.0	13	15	180	2
50 – 90	AU-1440-70	13	0.25	1.5:1	75/75	8.0	8.0	8.0	23	15	230	15-2
50 – 90	AU-1001	15	0.25	1.3:1	75/75	5.0	5.0	5.0	18	15	65	10
50 – 90	AU-1149-70	15	0.2	1.5:1	75/75	5.0	5.0	5.0	19	15	85	2
50 – 90	AU-1127-70	29	0.2	1.5:1	75/75	1.3	1.3	1.3	7	15	55	2
50 – 90	AU-1138-70	29	0.2	1.5:1	75/75	3.0	3.0	3.0	20	15	125	3
50 – 90	AU-2A-1138	29	0.25	1.3:1	75/75	2.9	2.9	2.9	20	15	125	3
50 – 90	AU-2A-1127	30	0.25	1.3:1	75/75	1.4	1.4	1.4	7	15	50	2
50 – 90	AU-1360-70	45	0.2	1.5:1	75/75	2.0	2.0	2.0	20	15	140	4
50 – 90	AU-2A-1360	45	0.25	1.3:1	75/75	2.0	2.0	2.0	20	15	140	4
100 – 180	AU-1552-140	10	0.25	1.5:1	75/75	5.0	5.0	5.0	20	15	85	1
100 – 180	AU-1576-140	12	0.25	1.3:1	75/50	9.0	9.0	9.0	14	15	180	2
100 – 180	AU-1149-140	15	0.2	1.5:1	75/75	6.0	6.0	6.0	18	15	85	2
100 – 180	AU-1541-140	24	0.2	1.5:1	75/75	2.5	2.5	2.5	20	15	180	2
100 – 180	AU-1092	29	0.25	1.3:1	75/75	3.2	3.2	3.2	18	15	125	3
100 – 180	AU-1092-140	29	0.2	1.5:1	75/75	3.2	3.2	3.2	19	15	125	3
100 – 180	AU-1127-140	29	0.2	1.5:1	75/75	1.3	1.3	1.3	7	15	55	2
100 – 180	AU-1293	29	0.25	1.3:1	75/75	1.5	1.5	1.5	7	15	55	2
100 – 180	AU-1360-140	45	0.2	1.5:1	75/75	2.0	2.0	2.0	19	15	140	4
SATCOM AMPLIFIERS												
50 – 90	AU-1372-70	7	0.2	1.5:1	50/50	8.0	8.0	8.0	13	15	65	1
50 – 90	AU-1552-70	10	0.25	1.5:1	75/75	4.5	4.5	4.5	20	15	85	1
50 – 90	AU-1574-70	12	0.25	1.5:1	75/75	4.5	4.5	4.5	18	15	85	1
50 – 90	AU-1576-70	12	0.25	1.3:1	75/50	9.0	9.0	9.0	13	15	180	2
50 – 90	AU-1440-70	13	0.25	1.5:1	75/75	8.0	8.0	8.0	23	15	230	15-2
50 – 90	AU-1510-70	13	0.2	1.5:1	50/50	7.0	7.0	7.0	23	15	250	2
50 – 90	AU-1538-70	13	0.2	1.5:1	50/50	7.0	7.0	7.0	17	15	165	2
50 – 90	AU-1049-70	14	0.2	1.5:1	50/50	2.7	2.7	2.7	10	15	40	1
50 – 90	AU-1A-1049	14	0.25	1.3:1	50/50	2.8	2.8	2.8	10	15	40	1
50 – 90	AU-1001	15	0.25	1.3:1	75/75	5.0	5.0	5.0	18	15	65	10
50 – 90	AU-1149-70	15	0.2	1.5:1	75/75	5.0	5.0	5.0	19	15	85	2