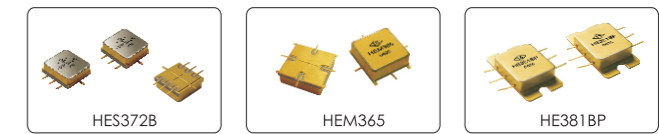


1-Amplifier Products  
1-1 General Amplifier



Part Number	Electrical Specifications												Absolute Ratings		Reliability parameters			Package	Application Circuit					
	Frequency f (MHz)	Gain Gp (dB)		Gain Flatness ΔGp (dB)		Input VSWR		Output VSWR		Noise Figure Fn (dB)		Output power at Po (1dB) 1dB compression		Current mA	Power Voltage (V)	Power Voltage Max (V)	Power input Max (dBm)			Failure Rate λb (10 <sup>-6</sup> /h)	ESDS	μ	Junction Temp higher than shell temp (°C)	
HEM311	1~110	18.0	17.0	0.6	1.0	1.7	2.0	1.7	2.0	4.2	4.5	18.0	17.0	58	70	12	14	10	0.062	1C	>1	17	SMO-8C	1-1
HEM361B	10~500	29.0	28.0	0.5	1.0	1.4	2.0	1.4	2.0	1.8	2.0	7.0	6.0	38	-	15	17	10	0.077	1C	>1	40	SMO-8C	1-3
HEM364B	10~200	33.5	32.0	0.2	1.0	1.2	1.5	1.2	1.5	1.4	1.5	8.0	6.0	38	-	15	17	10	0.077	1C	>1	40	SMO-8C	1-3
HES364B	10~200	33.5	32.0	0.2	1.0	1.3	2.0	1.3	2.0	1.4	1.5	8.0	6.0	38	-	15	17	10	0.077	1C	>1	40	SM64D	1-3
HEM364B-2	100~300	32.0	31.0	0.2	1.0	1.2	1.5	1.2	1.5	1.4	1.5	8.0	6.0	38	-	12	14	10	0.077	1C	>1	38	SMO-8C	1-3
☆ HEM365	20~200	18.0	16.0	1.0	2.0	1.6	2.0	1.6	2.0	4.2	4.5	18.0	17.0	58	-	12	14	10	0.062	1C	>1	32	SMO-8C	1-1
HEM371B	10~500	20.0	15.0	0.3	1.0	1.3	2.0	1.7	2.0	1.9	2.0	3.0	2.0	12	-	15	17	10	0.067	1C	<1	25	SMO-8C	1-4
HES371B	10~500	20.0	15.0	0.3	1.0	1.3	2.0	1.7	2.0	1.9	2.0	3.0	2.0	12	-	15	17	10	0.067	1C	<1	25	SM64D	1-4
☆ HEM372B	10~500	20.8	19.0	0.3	1.0	1.5	2.0	1.5	2.0	2.3	3.5	10.8	10.0	25	-	15	17	10	0.067	1C	<1	40	SMO-8C	1-4
☆ HES372B	10~500	20.8	19.0	0.3	1.0	1.5	2.0	1.5	2.0	2.3	2.5	10.8	10.0	25	-	15	17	10	0.067	1C	<1	40	SM64D	1-4
☆ HEM380A	10~400	14.0	13.0	0.6	1.0	1.6	2.0	1.6	2.0	3.5	4.0	17.0	16.0	40	50	15	17	10	0.070	1C	>1	40	SMO-8C	1-2
☆ HEM380B	10~400	14.0	13.0	0.6	1.0	1.6	2.0	1.6	2.0	3.8	4.2	20.0	19.0	50	60	15	17	10	0.070	1C	>1	42	SMO-8C	1-2
☆ HEM380C	10~400	17.0	16.0	0.5	1.0	1.6	2.0	1.6	2.0	3.0	3.5	17.0	16.0	42	50	15	17	10	0.070	1C	>1	40	SMO-8C	1-2
HES380C	10~400	17.0	16.0	0.5	1.0	1.6	2.0	1.6	2.0	3.0	3.5	17.0	16.0	38	50	15	17	10	0.070	1C	>1	40	SM64C	1-2
☆ HEM380D	10~400	17.0	16.0	0.5	1.0	1.6	2.0	1.6	2.0	3.2	3.5	20.0	19.0	50	60	15	17	10	0.07	1C	>1	40	SMO-8C	1-2
HES380D-5	5~100	20.0	19.0	0.3	1.0	1.5	2.0	1.5	2.0	3.2	3.5	19.0	18.0	50	60	12	14	10	0.07	1C	>1	35	SM64C	1-2
☆ HE381BP	20~500	11.8	11.0	0.3	1.0	1.4	2.0	1.7	2.0	2.4	2.5	12.8	12.0	32	-	15	17	10	0.070	1C	>1	32	SP-1	1-5
☆ HEM382B-1	20~1000	11.2	10.0	0.8	1.0	1.8	2.0	1.8	2.0	1.8	2.0	18.5	18	55	-	5	7	10	0.07	1C	>1	35	SMO-8C	1-5
☆ HEM382B-2	20~1000	14.5	14.0	0.8	1.0	1.8	2.0	1.8	2.0	1.6	2.0	19.5	19	55	-	5	7	10	0.07	1C	<1	35	SMO-8C	1-5
☆ HEM382B-14	800~890	15.0	14.0	0.5	1.0	1.8	2.0	1.8	2.0	1.8	2.0	20.5	20	65	-	5	7	10	0.07	1C	<1	37	SMO-8C	1-5
☆ HEM385A	20~400	8.5	8.0	0.4	1.0	1.6	2.0	1.6	2.0	1.5	1.6	12.0	10.0	15	-	15	17	18	0.070	1C	>1	35	SMO-8C	1-6
☆ HEM385B	20~400	8.5	8.0	0.4	1.0	1.6	2.0	1.6	2.0	1.8	2.0	21.0	16.0	30	-	15	17	18	0.070	1C	>1	40	SMO-8C	1-6
HEM386A	20~200	10.5	10.0	0.4	1.0	1.6	2.0	1.6	2.0	1.2	1.2	18.0	16.0	15	-	15	17	18	0.07	1C	>1	35	SMO-8C	1-6
☆ HEM386B	20~200	10.5	10.0	0.4	1.0	1.6	2.0	1.6	2.0	1.4	1.4	21.0	19.0	30	-	15	17	18	0.070	1C	>1	40	SMO-8C	1-6
HEM386B-2	20~200	10.5	10.0	0.4	1.0	1.6	2.0	1.6	2.0	1.4	1.4	19.0	18.0	30	-	12	15	18	0.07	1C	>1	40	SMO-8C	1-6
☆ HEM386D	20~200	10.3	10.0	0.3	1.0	1.7	2.0	1.7	2.0	1.3	1.5	12.5	10.0	12	-	5	8	18	0.070	1C	>1	30	SMO-8C	1-6
☆ HES386D	20~200	10.3	10.0	0.3	1.0	1.8	2.0	1.8	2.0	1.3	1.5	12.5	10.0	12	-	5	8	18	0.07	1C	>1	30	SM64C	1-6
☆ HES387A-4	300~400	25.0	24.0	0.5	1.0	1.6	2.0	1.6	2.0	2.5	3.0	15.0	13.0	30	-	12	14	13	0.073	1C	<1	38	SM64C	1-7
HES387A-5	50~200	26.0	25.0	0.4	1.0	1.5	2.0	1.5	2.0	2.5	3.0	17.5	16.5	30	-	15	17	13	0.073	1C	<1	42	SM64C	1-7
☆ HE387BP	200~300	26.0	25.0	0.4	1.0	1.5	2.0	1.5	2.0	2.9	3.0	21.0	20.0	45	-	15	17	13	0.073	1C	>1	42	SP-1	1-7
☆ HES387E	20~300	25.0	24.0	0.5	1.0	1.6	2.0	1.6	2.0	1.1	1.5	12.5	11.0	18	-	5	7	7	0.073	1C	<1	35	SM64C	1-7
☆ HEM387E-1	130~250	25.0	24.0	0.5	1.0	1.6	2.0	1.6	2.0	1.1	1.5	12.5	11.0	18	-	5	7	7	0.073	1C	<1	35	SMO-8C	1-7
☆ HEM387E-3	30~100	25.0	24.0	0.5	1.0	1.6	2.0	1.6	2.0	1.1	1.5	12.5	11.0	18	-	5	7	7	0.073	1C	<1	35	SMO-8C	1-7
☆ HEM388D	100~600	21.0	19.0	0.5	1.0	1.6	2.0	1.6	2.0	1.0	2.0	17.0	15.0	55	65	5	7	13	0.071	1B	<1	38	SMO-8C	1-8
HEM388D-17	20~500	21.0	19.0	0.6	1.0	1.6	2.0	1.6	2.0	1.0	2.0	15.0	13.0	40	45	5	7	13	0.071	1B	<1	38	SMO-8C	1-8
HEM388D-2	20~600	22.0	21.0	0.7	1.0	1.7	2.0	1.7	2.0	1.0	1.5	20.0	19.0	80	100	5	7	13	0.071	1B	<1	38	SMO-8C	1-8
☆ HEM388D-3	30~500	21.0	19.0	0.5	1.0	1.6	2.0	1.6	2.0	1.0	2.0	17.0	15.0	55	65	5	7	13	0.075	1B	<1	38	SMO-8C	1-8
HEM388D-30	20~100	19.0	17.0	0.2	0.5	1.4	1.5	1.4	1.5	1.5	3.0	20.0	19.0	75	80	5	7	13	0.071	1B	<1	38	SMO-8C	1-8
☆ HEM388D-5	50~250	21.0	19.0	0.5	1.0	1.5	2.0	1.5	2.0	1.0	2.0	17.0	16.0	55	70	5	7	13	0.075	1B	<1	38	SMO-8D	1-8
HEM388E-14	130~700	21.0	20.0	0.5	1.0	1.7	2.0	1.7	2.0	1.0	2.0	17.0	16.5	48	50	5	7	13	0.075	1B	<1	38	SMO-8C	1-8

### 1-1 General Amplifier (continued)

Part Number	Electrical Specifications													Absolute Ratings			Reliability parameters				Package	Application Circuit		
	Frequency f (MHz)	Gain Gp (dB)		Gain Flatness ΔGp (dB)		Input VSWR VSWRi		Output VSWR VSWRo		Noise Figure Fn (dB)		Output power at 1dB compression PO (1dB)		Current mA	Power Voltage (V)	Power Voltage Max (V)	Power input Max (dBm)	Failure Rate λb (10 <sup>-6</sup> /h)	ESDS	μ			Junction Temp higher than shell temp °C	
HEM388E-15	100~700	21.0	20.5	0.5	1.0	1.7	1.8	1.7	1.8	1.0	2.0	13.0	10.0	33	35	5	7	13	0.075	1B	<1	38	SMO-8C	1-8
HEM388E-18	200~350	22.0	21.0	0.3	1.0	1.7	2.0	1.7	2.0	1.0	2.0	17.0	16.0	48	50	5	7	13	0.075	1B	<1	38	SMO-8C	1-8
☆ HES388E	300~1000	21.0	19.0	0.5	1.0	1.6	2.0	1.6	2.0	1.0	2.0	17.0	15.0	55	65	5	7	13	0.071	1B	>1	38	SM64C	1-8
☆ HEM389A	20~250	30.0	29.0	0.5	1.0	1.7	2.0	1.7	2.0	2.3	2.5	21.0	20.0	45	-	15	16	13	0.073	1C	>1	42	SMO-8C	1-7
☆ HES389A-1	50~100	29.0	28.0	0.5	1.0	1.7	2.0	1.7	2.0	2.5	3.0	18.0	16.0	45	-	12	14	13	0.073	1C	<1	43	SM64C	1-7
☆ HEM389B-1	20~100	30.0	29.0	0.5	1.0	1.7	2.0	1.7	2.0	2.8	3.0	22.0	21.0	55	-	12	14	13	0.073	1C	>1	43	SMO-8C	1-7
HEM389B-2	20~180	30.0	29.0	0.5	1.0	1.7	2.0	1.7	2.0	2.8	3.0	22.0	21.0	55	-	12	14	13	0.073	1C	>1	43	SMO-8C	1-7
HEM389B-3	8~180	30.0	29.0	0.5	1.0	1.7	2.0	1.7	2.0	3.0	3.2	22.0	21.0	55	-	12	14	13	0.073	1C	<1	43	SMO-8C	1-7
HEM389B-4	10~120	30.0	29.0	0.5	1.0	1.7	2.0	1.7	2.0	3.2	3.5	23.5	23.0	65	-	12	14	13	0.073	1C	<1	43	SMO-8C	1-7
HE390B	20~520	17.0	15.0	0.4	1.0	1.8	2.0	1.6	2.0	3.0	3.5	29.0	28.0	180	-	12	12	17	0.088	1B	>1	45	SP-1A	1-12
HE390B-4	30~200	16.0	15.0	0.4	1.0	1.8	2.0	1.6	2.0	3.0	5.0	28.0	27.0	140	-	12	12	17	0.088	1B	>1	45	SP-1A	1-12
☆ HEM393A	10~500	18.8	17.0	0.2	1.0	1.5	2.0	1.5	2.0	2.5	3.0	12.5	11.0	30	35	5	6	10	0.071	1B	<1	25	SMO-8C	1-8
☆ HEM393B	10~500	18.8	17.0	0.2	1.0	1.5	2.0	1.7	2.0	3.5	4.5	17.0	16.5	56	65	5	6	10	0.071	1B	<1	30	SMO-8C	1-8
☆ HEM394A	10~1000	16.0	15.0	0.3	1.0	1.7	2.0	1.8	2.0	3.0	3.5	10.8	10.0	30	35	5	6	10	0.071	1B	<1	25	SMO-8C	1-8
☆ HEM394B-2	10~80	21.8	20.0	0.2	1.0	1.3	2.0	1.3	2.0	3.2	-	15.8	15.0	56	65	5	6	10	0.071	1B	<1	35	SMO-8C	1-8
☆ HEM396A	20~500	11.0	10.0	0.3	1.0	1.3	2.0	1.3	2.0	2.2	2.5	8.0	7.0	17	30	5	8	10	0.074	1C	<1	30	SMO-8C	1-5
☆ HE461B	10~1000	24.5	23.0	0.8	1.5	1.7	2.0	1.7	2.0	3.0	4.0	10.4	10.0	45	-	15	18	10	0.079	1C	>1	40	TO-8A	1-3
HE872	20~1000	37.0	35.0	1.0	1.5	1.5	2.0	1.5	2.0	1.0	2.5	17.5	16.0	80	90	5	7	10	0.088	1B	>1	35	TO-8D	1-9
☆ HE872-1	30~200	40.0	38.0	-	-	1.5	2.0	1.5	2.0	1.0	2.5	13.0	10.0	50	70	5	7	10	0.088	1B	>1	15		1-9

### 1-2 GaAs Amplifier

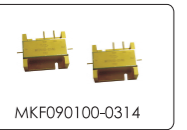


Part Number	Electrical Specifications													Absolute Ratings			Reliability parameters			Package	Application Circuit
	Frequency f (MHz)	Gain Gp (dB) Typ Min	Gain Flatness ΔGp (dB) Typ Max	Input VSWR VSWRi Typ Max	Output VSWR VSWRo Typ Max	Noise Figure Fn (dB) Typ Max	Output power at 1dB compression Po (1dB) Typ Min	Current mA Typ Max	Power Voltage (V)	Power Voltage Max (V)	Power input Max (dBm)	Failure Rate λb (10 <sup>-6</sup> /h)	ESDS	μ	Junction Temp higher than shell temp °C						
HEM552L	1.2~1.5	30.0 22.0	1.0 1.5	1.8 2.0	1.8 2.0	1.0 1.35	12.0 11.0	65 75	5	6	10	0.070	1B	>1	20	SMO-8D	1-11				
HES552L	1.2~1.5	30.0 23.0	1.0 -	1.8 2.0	1.8 2.0	1.0 1.3	12.0 10.0	63 70	5	6	10	0.070	1B	>1	20	SM64D	1-11				
☆ HEM552L-4	1.15~1.63	35.0 34.0	0.7 1.5	1.8 2.0	1.8 2.0	1.0 1.3	12.0 10.0	65 75	5	6	10	0.073	1B	>1	20	SMO-8D	1-11				
HE553-5	1.5~1.8	30.0 28.0	1.0 -	1.6 2.0	1.6 2.0	1.0 2.0	12.0 10.0	55 65	12	14	13	0.070	1B	>1	21	SP-1	1-11				
☆ HEM553L	1.4~1.7	30.0 23.0	1.0 -	1.8 2.0	1.8 2.0	1.0 1.4	12.0 10.0	65 75	5	6	10	0.070	1B	>1	20	SMO-8D	1-11				
☆ HE554F-x	2.2~2.3	27.2 26.0	0.3 1.0	1.5 2.0	1.5 2.0	2.0 2.5	8.0 6.0	45 50	12	13.5	10	0.070	1B	>1	6	SP-1	1-11				
HE554F-1	2.1~2.12	35.0 33.0	0.3 0.5	1.6 2.0	1.5 2.0	1.0 1.2	3.0 0	45 50	5	6	10	0.080	1B	>1	6	W06C	1-11				
HE554F-2	2.05~2.15	35.0 33.0	0.3 0.6	1.6 2.0	1.5 2.0	0.9 1.0	3.0 0	45 50	5	6	10	0.080	1B	>1	6	W06C	1-11				
HE554F-3	2.89~2.99	35.0 33.0	0.3 1.0	1.4 1.5	1.4 1.5	0.9 1.1	11.0 10.0	70 75	5	6	10	0.080	1B	>1	10	W06C	1-11				
☆ HE554L	2.0~2.5	26.0 22.0	1.0 2.0	1.8 2.0	1.8 2.0	1.0 1.4	11.0 10.0	65 75	5	6	10	0.070	1B	>1	8	SP-1	1-11				
HEM554	2.0~2.5	26.0 22.0	1.0 -	1.8 2.0	1.8 2.0	1.0 1.5	11.0 10.0	65 70	12	14	13	0.070	1B	>1	20	SMO-8D	1-11				
HEM554L	2.0~2.5	26.0 22.0	1.0 -	1.8 2.0	1.8 2.0	1.0 1.5	11.0 10.0	65 70	5	7	13	0.070	1B	>1	20	SMO-8D	1-11				
☆ HEM554-1	2.0~2.1	25.0 23.0	0.2 -	1.4 1.5	1.4 1.5	1.0 1.3	5.0 0.0	32 35	5	6	10	0.073	1B	>1	10	SMO-8D	1-11				
HEM554-4	2.4~2.5	26.0 22.0	0.2 -	1.4 1.5	1.4 1.5	1.0 1.3	5.0 0.0	32 35	5	6	10	0.073	1B	>1	10	SMO-8D	1-11				
HES554	2.0~2.5	28.0 22.0	1.0 -	1.6 2.0	1.6 2.0	0.9 1.5	11.0 10.0	65 70	12	14	13	0.070	1B	>1	20	SM64D	1-11				
HES554L	2.0~2.5	28.0 22.0	1.0 -	1.6 2.0	1.6 2.0	0.9 1.5	11.0 10.0	65 70	5	7	13	0.070	1B	>1	20	SM64D	1-11				
HES554BL	2.4~2.8	26.0 22.0	1.0 -	1.6 2.0	1.6 2.0	0.9 1.5	11.0 10.0	65 70	5	7	13	0.070	1B	>1	10	SM64D	1-11				
☆ HEM554BL	2.4~2.8	25.0 22.0	1.0 -	1.7 2.0	1.7 2.0	1.1 1.5	12.0 10.0	60 70	5	6	10	0.073	1B	>1	10	SMO-8D	1-11				
HEM571-4	0.8~2.5	16.5 14.0	0.7 1.0	1.6 2.0	1.6 2.0	2.0 3.0	21.0 20.0	75 90	12	14	13	0.063	1B	>1	20	SMO-8C	1-12				
☆ HEM571L	1.0~3.5	14.5 11.0	0.8 1.5	1.6 2.0	1.6 2.5	2.5 5.5	19.0 ≥18.0*	75 85	5	6	10	0.063	1B	>1	42	SMO-8C	1-12				
☆ HEM572	0.8~3.5	14.5 12.0	0.8 1.5	1.6 2.0	1.6 2.0	2.5 5.5	15.0 13.0	40 45	12	13.5	10	0.063	1B	>1	30	SMO-8C	1-12				
HEM572L	0.8~3.5	14.5 12.0	0.8 1.5	1.6 2.0	1.6 2.0	2.5 4.0	15.0 13.0	40 45	5	6	10	0.063	1B	>1	30	SMO-8C	1-12				
☆ HEM573	0.6~2.0	14.5 12.0	0.8 1.5	1.6 2.0	1.6 2.0	2.5 5.5	20.5 20.0*	65 75	12	13.5	10	0.063	1B	>1	30	SMO-8C	1-12				
HEM574	0.6~2.5	14.5 12.0	0.5 2.0	1.6 2.0	1.8 2.5	2.5 5.5	20.0 19.0*	65 -	12	14	13	0.063	1B	>1	30	SMO-8C	1-12				
☆ HES574	0.6~2.5	14.5 12.0	0.5 1.0	1.6 2.0	1.8 2.0	2.5 3.0	20.0 19.0*	65 75	12	14	13	0.063	1B	>1	30	SM64D	1-12				
☆ HEM574L	0.6~2.5	14.5 12.0	0.5 2.0	1.6 2.0	1.8 2.5	2.5 5.5	20.0 19.0*	65 -	5	7	13	0.063	1B	>1	30	SMO-8C	1-12				
☆ HES574L	0.6~2.5	14.5 12.0	0.5 1.0	1.6 2.0	1.8 2.0	2.5 3.0	19.0 18.0*	65 75	5	7	13	0.063	1B	>1	30	SM64D	1-12				
☆ HEM574-1	2.0~2.3	14.0 12.0	0.4 1.0	1.6 2.0	1.6 2.0	2.5 4.0	10.0 5.0	27 30	12	13.5	10	0.063	1B	>1	20	SMO-8C	1-12				
☆ HEM574-2	0.9~1.4	15.0 13.0	0.4 1.0	1.6 2.0	1.6 2.0	--	18.5 17.0	70 80	5	6	10	0.063	1B	>1	40	SMO-8C	1-12				
☆ HEM581	0.8~2.5	23.0 19.0	1.0 -	1.6 2.0	1.6 2.0	2.5 5.5	15.0 13.0	70 75	12	13.5	10	0.073	1B	>1	30	SMO-8D	1-13				
HES581	0.8~2.5	23.0 19.0	1.0 -	1.6 2.0	1.6 2.0	2.5 5.5	15.0 13.0	70 75	12	13.5	10	0.073	1B	>1	30	SMO-8D	1-13				
☆ HEM581-2	0.8~2.5	21.0 19.0	1.0 1.5	1.7 2.0	1.7 2.0	2.5 4.0	13.5 13.0	75 85	10	11.5	10	0.073	1B	>1	28	SMO-8D	1-13				
☆ HEM581L	0.8~2.5	23.0 19.0	1.0 -	1.8 2.5	1.4 2.5	2.3 5.5	13.0 11.0	65 85	5	6	10	0.073	1B	>1	28	SMO-8D	1-13				
HES581L	0.8~2.5	23.0 19.0	1.0 1.5	1.8 2.5	1.8 2.5	3.0 5.5	13.0 11.0	65 85	5	7	13	0.073	1B	>1	28	SM64D	1-13				
HEM581L-5	1.3~2.2	24.0 26.0	0.8 -	1.5 1.8	1.5 1.8	1.7 2.0	13.0 12.0	65 75	5	7	13	0.073	1B	>1	35	SMO-8D	1-13				
HEM641	1.0~3.5	16.0 15.0	2.0 3.0	1.8 2.0	1.8 2.0	3.0 5.5	20.0 19.0	65 120	12	13.5	10	0.063	1B	>1	30	SMO-8C	1-12				
☆ HE641B	1.3~1.65	24.0 23.0	1.5 2.0	1.5 2.0	1.5 2.0	--	22.5 22.0	110 120	12	13.5	10	0.073	1B	>1	40	SP-3	1-14				
☆ HE641B-2	0.5~1.1	31.5 29.0	1.0 2.0	1.3 2.0	--	3.0 5.0	24.6 24.0	165 175	12	13.5	10	0.073	1B	>1	45	SP-3	1-14				
☆ HE161系列	L band	32.0 30.0	--	1.8 2.0	--	--	33.0 32.0	700 800	-5V,+10V	-5.5V,+11V	7	0.170	1B	>1	35	SP-1A	--				
☆ HE160系列	S band	32.0 30.0	--	1.8 2.0	--	--	33.0 32.0	700 800	-5V,+10V	-5.5V,+11V	7	0.170	1B	>1	35	SP-1A	--				

Note: \*Po 饱和功率



### 1-3 MKF series Amplifiers



Part Number	Electrical Specifications													Absolute Ratings			Reliability parameters			Junction Temp higher than shell temp °C	Application Circuit
	Frequency f (MHz)	Gain Gp (dB) Typ Min	Gain Flatness ΔGp (dB) Typ Max	Input VSWR VSWRi Typ Max	Output VSWR VSWRo Typ Max	Noise Figure Fn (dB) Typ Max	Output power at 1dB compression Po (1dB) Typ Min	Current mA Typ Max	Power Voltage (V)	Power Voltage Max (V)	Power input Max (dBm)	Failure Rate λb (10 <sup>-6</sup> /h)	ESDS	μ							
※ MKF004020-0210K	0.4~2.0	24.5 23.0	0.5 1.0	1.5 1.8	1.5 1.8	1.6 1.8	11.0 10.0	65 100	15	18	10	0.112	1B	>1	10	2C					
※ MKF004020-0210J	0.4~2.0	24.5 23.0	0.5 1.0	1.5 1.8	1.5 1.8	1.6 1.8	11.0 10.0	65 100	15	18	10	0.112	1B	>1	10	2C					
※ MKF020060-0212	2.0~6.0	20.5 19.0	0.7 1.0	1.7 2.0	1.7 2.0	1.9 2.0	12.5 12.0	80 85	15	18	10	0.108	1B	>1	20	2C					
※ MKF040060-0310	4.0~6.0	28.0 26.0	0.5 1.0	1.5 1.8	1.5 1.8	1.0 1.2	11.0 10.0	110 120	15	18	10	0.124	1B	>1	30	2C					
※ MKF090120-0210	9.0~12.0	22.5 21.0	1.0 2.0	1.7 2.0	1.7 2.0	2.2 2.4	11.0 10.0	80 90	15	18	10	0.102	1B	>1	20	2C					
MKF003005-0210	0.3~0.5	26.0 25.0	0.3 1.0	1.4 1.6	1.4 1.6	1.0 1.2	12.0 10.0	70 100	15	18	10	0.112	1B	>1	10	2C					
MKF003005-0310	0.3~0.5	40.0 39.0	0.3 1.0	1.4 1.6	1.4 1.6	1.0 1.2	12.0 10.0	75 100	15	18	10	0.112	1B	>1	10	2C					
MKF040060-0412	4.0~6.0	36.0 33.5	0.7 1.0	1.7 2.0	1.7 2.0	1.0 1.2	12.0 10.0	115 130	15	18	10	0.124	1B	>1	30	2C					
MKF0910-0112	9.3~9.9	13.0 12.0	0.4 1.0	1.5 2.0	1.5 2.0	2.2 2.5	13.0 12.0	48 50	5	7	10	0.079	1B	>1	12	2C					
MKF0305-0113	3.5~4.5	17.5 16.0	0.7 1.0	1.7 2.0	1.7 2.0	2.3 2.5	16.0 15.0	75 85	5	7	10	0.091	1B	>1	12	2C					
MKF0509-0213	5.3~9.0	17.5 16.0	0.7 1.0	1.7 2.0	1.7 2.0	2.7 3.0	14.0 13.0	65 80	5	7	10	0.094	1B	>1	22	2C					
MKF0307-0113	3.5~6.5	13.5 12.0	0.7 1.0	1.7 2.0	1.7 2.0	2.7 3.0	13.0 12.0	80 90	5	7	10	0.091	1B	>1	15	2C					
MKF0910-0217	9.0~10.0	21.5 20.0	0.5 1.0	1.7 2.0	1.7 2.0	3.0 5.0	13.0 12.0	65 90	5	7	10	0.080	1B	>1	15	2C					
MKF002008-0310	0.2~0.8	31.0 30.0	1.0 2.0	1.7 2.0	1.7 2.0	0.8 1.0	11.0 10.0	70 100	5	7	10	0.085	1B	>1	20	2C					
MKF010030-0210	1.0~3.0	21.0 20.0	0.8 -	1.7 2.0	1.7 2.0	1.6 2.0	11.0 10.0	70 100	5	7	10	0.109	1B	>1	10	2C					
MKF008030-0310	0.8~2.5	32.0 31.0	1.0 2.0	1.7 2.0	1.7 2.0	1.0 1.2	11.0 10.0	70 100	5	7	10	0.072	1B	>1	20	3C					
MKF020090-0310	2.5~8.4	32.0 31.0	1.0 2.0	1.9 2.0	1.9 2.0	1.0 1.2	11.0 10.0	90 100	5	7	10	0.115	1B	>1	30	2C					
MKF020090-0110	2.0~9.0	10.8 10.0	1.2 2.0	2.0 2.5	2.0 2.5	2.3 2.5	11.0 10.0	40 60	12	15	10	0.072	1B	>1	20	2C					
MKF014028-0210	1.4~2.75	27.0 24.5	3.0 3.1	1.3 1.5	1.3 1.5	1.0 1.25	12.5 12.0	75 85	5	5.5	13	0.100	1B	>1	20	3C					
MKF011016-0310	1.15~1.63	35.5 34.0	0.8 1.5	1.6 2.0	1.4 2.0	0.9 1.3	11.5 10.0	65 75	5	6.5	13	0.098	1B	>1	5	MDFP4322-W2					
MKF0103-2818	1.4~2.8	29.5 28.0	1.0 1.5	1.7 2.0	1.5 2.0	1.3 1.5	19.0 18.0	110 125	5	6.5	10	0.099	1B	>1	15	MPFT1817-W4					
MKF0307-0118	3.5~6.5	17.0 15.0	0.7 1.0	1.7 2.0	1.7 2.0	2.3 2.5	19.0 18.0	85 150	5	7	10	0.091	1B	>1	15	2C					
MKF0109-0212	1.0~8.5	20.5 19.0	0.8 1.5	2.0 2.2	2.0 2.2	2.5 3.0	12.5 12.0	89 100	5	7	10	0.122	1B	>1	10	3C					
MKF1018-0217	10.0~18.0	21.0 20.0	1.5 2.5	2.0 2.5	2.0 2.5	4.2 5.5	17.5 17.0	175 185	5	7	10	0.087	1B	>1	30	2C					
MKF1018-0113	10.0~18.0	20.0 18.0	1.5 2.0	2.0 2.2	2.0 2.2	4.0 5.0	13.0 12.0	90 95	5	7	10	0.087	1B	>1	19	2C					
MKF002030-0112	0.2~2.6	17.0 16.0	0.7 1.0	1.7 2.0	1.7 2.0	1.6 1.8	13.0 12.0	32 45	5	7	10	0.088	1B	>1	12	2C					
MKF0408-0213	4.0~8.0	21.5 20.0	1.7 2.0	1.7 2.5	1.8 2.5	1.8 2.5	14.0 13.0	60 80	12	15	10	0.092	1B	>1	20	2C					
※ MKF001030-0210	0.1~2.6	28.5 26.0	1.0 3.0	1.7 2.0	1.8 2.0	1.6 1.8	13.0 10.0	70 100	15	18	10	0.112	1B	>1	10	2C					
MKF090110-0315	9.0~11.0	28.0 27.0	0.5 1.0	1.5 2.0	1.6 2.0	2.2 -	16.0 15.0	90 140	15	18	10	0.102	1B	>1	25	2C					
MKF080083-0211	8.0~8.3	22.0 20.0	0.3 0.5	1.5 1.8	1.5 1.8	1.2 1.3	12.0 11.0	70 80	5	7	10	0.079	1B	>1	18	2C					
※ MKF090100-0310	9.2~10.0	31.5 31.0	0.5 1.0	1.5 1.8	1.6 1.8	1.4 1.6	12.0 10.0	100 -	15	18	10	0.082	1B	>1	25	MTFM1609-W3					
※ MKF090100-0310-1	9.0~10.0	32.0 30.0	0.5 1.0	1.5 1.8	1.6 1.8	1.4 2.0	12.0 10.0	100 -	15	18	10	0.082	1B	>1	25	MTFM1609-W3					
※ MKF090100-0314	9.0~10.0	32.0 31.0	0.5 1.0	1.5 1.8	1.6 1.8	1.2 1.3	12.0 11.0	110 -	15	18	10	0.082	1B	>1	28	MTFM1609-W3					
※ MKF002006-0210	0.2~0.6	29.0 28.0	0.3 1.0	1.3 1.8	1.3 1.8	1.0 1.6	10.0 8.0	70 -	15	18	10	0.112	1B	>1	10	MTFM1109-W3					
※ MKF004006-0410	0.2~0.6	42.0 41.0	0.3 1.0	1.3 1.8	1.2 1.8	1.4 1.6	13.0 11.0	70 -	15	18	10	0.112	1B	>1	10	MTFM1609-W3					
※ MKF090100-0220	9.2~10.0	24.0 22.0	0.6 1.0	1.6 1.8	1.6 1.8	3.0 3.5	23.0 22.0	200 -	15	18	10	0.097	1B	>1	25	MTFM1710-W3					
※ MKF090100-0327	9.2~10.0	31.0 30.0	0.7 1.0	1.6 1.8	1.6 1.8	3.0 3.5	27.0 26.0	350 -	15	18	10	0.102	1B	>1	30	MTFM4011-W4					
※ MKF090100-0314VG	9.0~10.0	34.0 32.0	0.5 1.0	1.5 1.8	1.6 1.8	1.7 2.0	12.0 10.0	110 -	15/0~3V	18	10	0.081	1B	>1	28	MTFM2209-W4					
※ MKF002006-0118	0.2~0.6	17.0 16.0	0.5 1.0	1.4 1.8	1.4 1.8	1.4 1.6	19.0 18.0	75 -	15	18	10	0.101	1B	>1	15	MTFM1609-W3					

### 1-4 VGC Amplifier

	Part Number	Electrical Specifications										Absolute Ratings			Reliability parameters				Package	Application Circuit
		Frequency $f_r$ (MHz)	Gain $G_p$ (dB) Typ Min	VGC control (dB) Typ Min	Output power at 1dB compression $P_o$ (1dB) Typ Min	Noise Figure $F_n$ (dB) Typ Max	VSWR Typ Max	Voltage/Current V/mA Typ	Power voltage Max (V)	Input power Max (dBm)	Failure Rate $\lambda_B$ ( $10^{-6}/h$ )	ESDS	$\mu$	Junction Temp higher than shell temp $^{\circ}C$						
☆	HE761X	9~13	18 17	40 20	4.0 3.0	3.5 4.5	1.7 2.0	11.4/25	13	10	0.082	1C	> 1	30	TO-8G	1-23				
☆	HE762	20~200	31 30	53 50	9.0 6.0	4.0 5.0	1.6 2.0	12/50	15	10	0.091	1C	> 1	40	TO-8H	1-23				

### 1-5 Space level amplifier application guide

#### Selection instruction

Product list includes existing space standard products. The products with “☆” are the products screening with spac standard, all operating temperature range: -55 $^{\circ}C$ ~+85 $^{\circ}C$ . Please contact with us, If the customer need custom design products.

#### Reliability:

- Anti-ESD: All active products in catalog are electrostatic sensitive circuit, ESD protection should be taken on it. Although we design built-in protection circuit in some parts, but some not due to the limitation on dimensions. According to GJB548B-2005, the ESD sensitivity classification are as following.

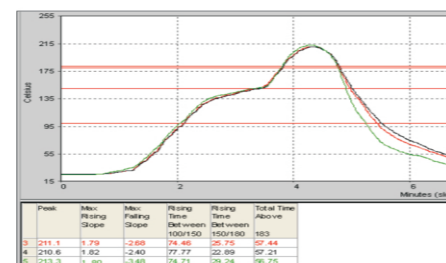
Degree	Voltage range
0	< 250V
1A	250V~499V
1B	500~999V
1C	1000V~1999V
2	2000V~3999V

- Anti-radiation: All active parts in catalogue can withstand  $\gamma$  total dose 300Krad (Si) radiation dose, otherwise indicated products will be listed in the product list irradiation dose.
- The basic failure rate  $\lambda_b$  in catalogue are calculated base on GJB/Z299C, work failure rate  $\lambda_p$  is calculated by actual situation.
- Internal components in accordance with GJB / Z 35-93 were derating, when used according to the rated voltage requirements please supply derating shall not otherwise affect the normal operation of the circuit. In addition to 1.3 & 1.4GaAs amplifier maximum channel temperature 175  $^{\circ}C$ , the remaining maximum junction temperature 200  $^{\circ}C$ . Installed correctly to ensure that the shell temperature  $\leq 70^{\circ}C$  level to meet derating.

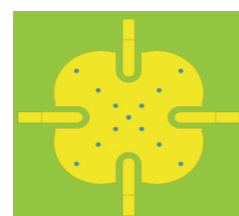
#### SMO and other SMT series

For surface mount circuit(such as SMO series, CR-9 etc),we recommend use reflow to weld. In order to achieve therequired performance and reliability, hand soldering can be used. The max temperature of reflow can not exceed 220  $^{\circ}C$  the reflow peak should meet the temperature between 205~220  $^{\circ}C$ . The time of liquid phase should be in 45s~90s.

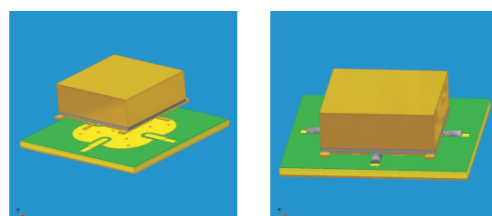
The right figure shows the temperature zone of reflow and actual welding curve, the typical curves of temperature. The max peak is 228 $^{\circ}C$  measured as 213.3 $^{\circ}C$ . The customer can set process parameter according to this figure.



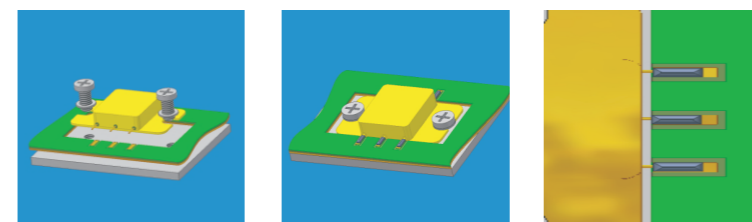
#### ●PCB Layout (for SMO-8C package)



#### ●Assembly method



#### SP and QF series



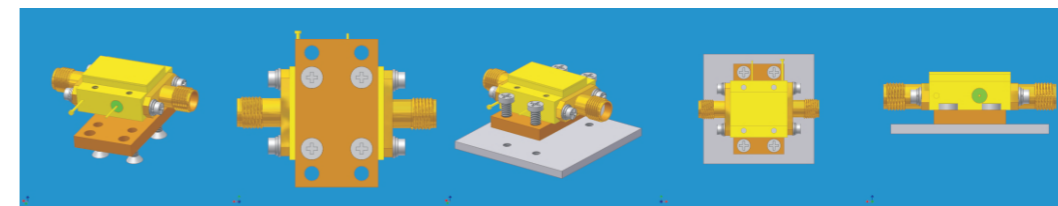
#### Instruction :

- (1)When you design the circuit for SP package or similar, must pay attention to keep the space between PCB and lead to prevent short circuit. The lead of SP package should be in same plane with PCB pad or slightly lower.
- (2)Please use screws to fix the SP package, pay attention to the position of screw, three-quarters of pad should in a plane, avoiding pressure on the edges of the flange.

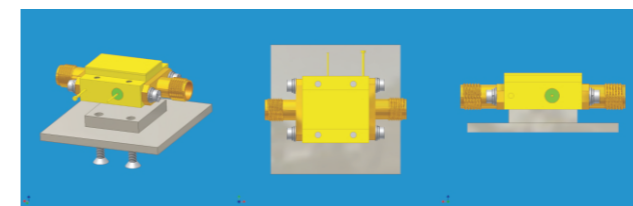
#### Removable SMA package

#### Assembly Method

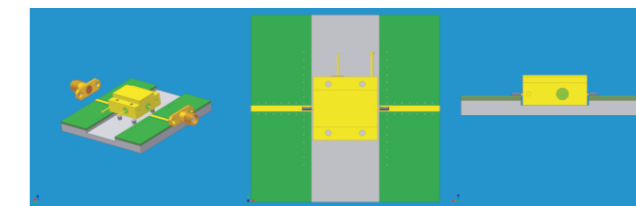
##### Method 1:



##### Method 2:



##### Method 3:



#### Introduction:

- (1) Removable SMA package should be installed in a raised platform, otherwise it can't be connected
- (2) Assembling package without removable SMA connector should ensure pins and PCB board pad in the same plane, or slightly lower.

#### 1.8.3 Storage after delivery

- All parts dipped in 823 protective before delivery. But gross leak test will destroy the protective layer. Please recoat 823. ESD protection must be observed when leak testing.
- If the customer need to keep the parts in rainy and humid areas in long term (more than half year), it is better to put them in nitrogen environment, keep the humidity no more than 60%.