

Kuhne MKU LNA 131 AH
F5KSE repair attempt

F4LOX

MKU LNA 131 AH specification

MKU LNA 131 AH, Super low noise preamplifier



1296 MHz

Super Low Noise HEMT Preamplifier for DX and EME

net: 289,08 €

344,00 €

incl. 19% Vat. plus shipping

Lead time on request

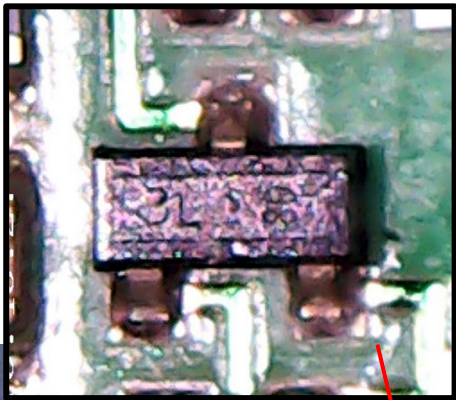
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ADD TO BASKET

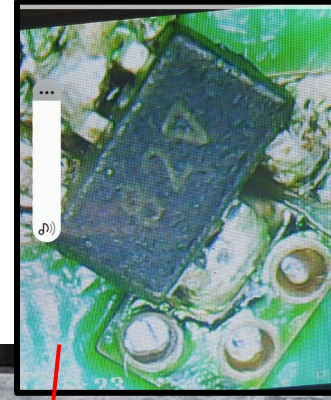
Technical specifications	Description	Features	Important notes	Downloads	Accessories
Frequency range	1246..1346 MHz				
Noise figure @ 18 °C	0.4 dB +/- 0,05				
Gain	typ. 20 dB				
Maximum input power	1 mW				
Supply voltage	+9 ... 15 V DC				
Current consumption	typ. 15 mA				
Operating case temp. range	-20 ... +65°C				
Input connector / impedance	N-male, 50 ohms				
Output connector / impedance	N-female, 50 ohms				
Case	milled aluminium				
Dimensions (mm)	50 x 30 x 22				
Weight	100 g (typ.)				



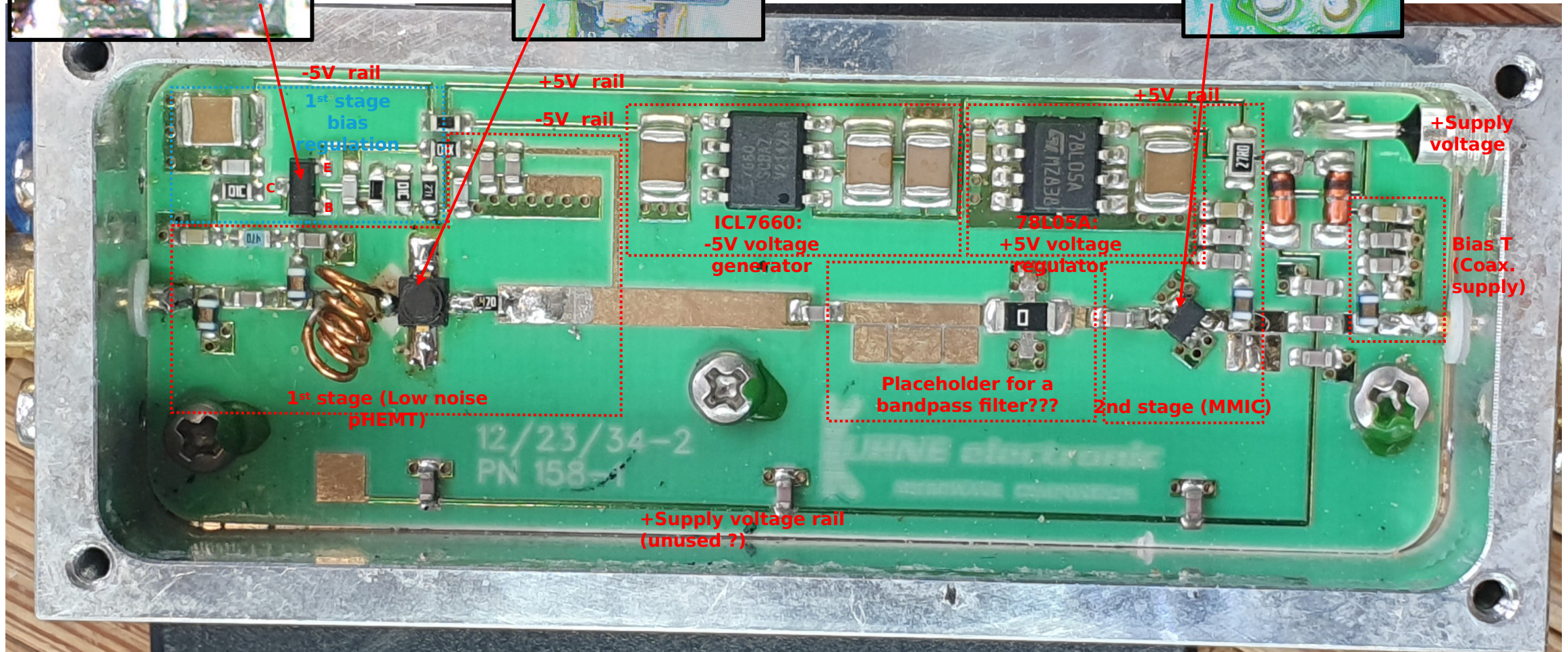
BC858C
PNP transistor



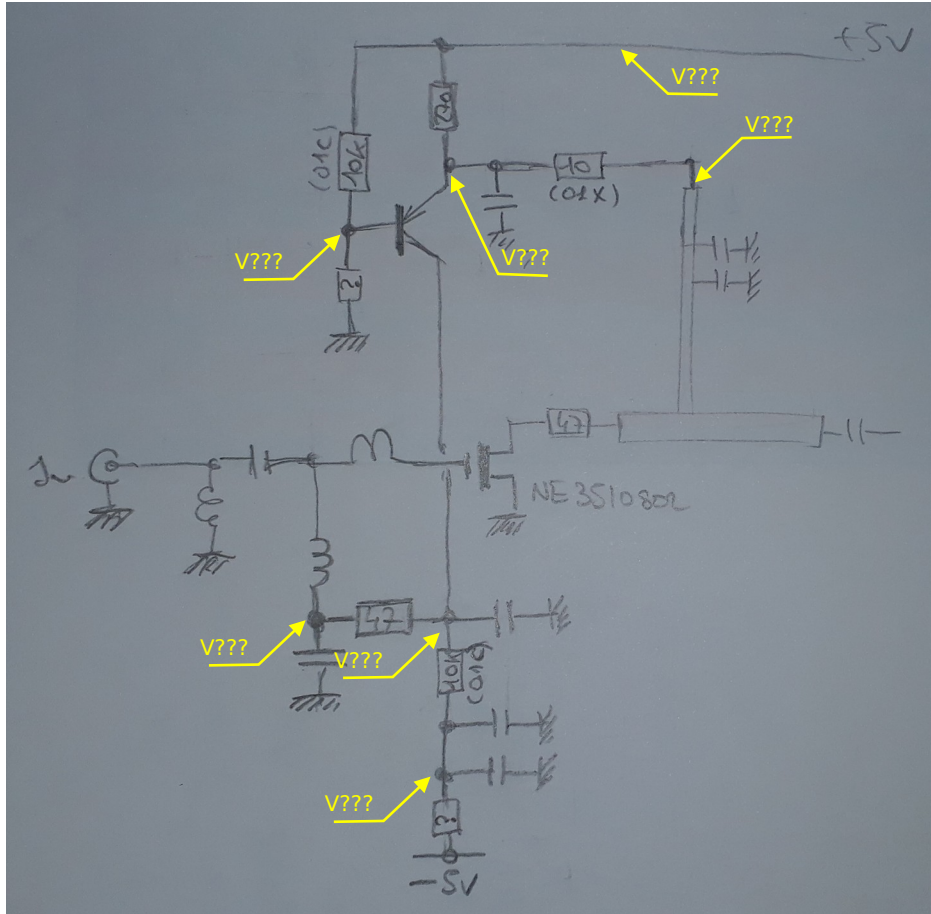
NE3511S02 : **Obsolete**
Drop-in replacement: CE3512K2



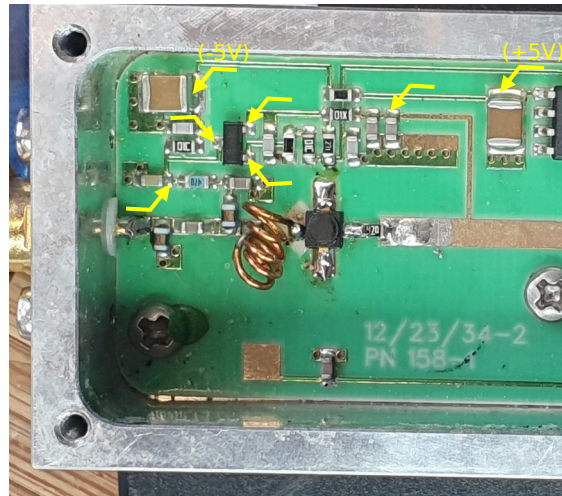
MGA-82563
MMIC RF amp.



Partial schematics (1st stage and bias reg.)



BC558C (PNP transistor) is operating as a current source, setting current in the 270Ω resistor (and therefore in NE3510 pHEMT drain) based on its base voltage: $I_d = (V_{base} - 0.7V) / 270\Omega$ voltage
Vbase is set by base resistive divider (unknown ratio!)
To regulate its emitter current, PNP will adjust its collector voltage and therefore pHEMT gate voltage to the right voltage (close loop operation).



NE3511S02 equivalent



To: ALL FIELD

Date: 11/10/2016

Subject: PRODUCT CHANGE NOTICE

Renesas has decided to withdraw from the Microwave Semiconductor Device business as described in their press release from August 2, 2016 (<https://www.renesas.com/en-hq/about/press-center/news/2016/news20160802.html>).

The parts affected include all the RF and Microwave devices offered through CEL.

There are CEL direct drop-in replacement parts to many of the Renesas Microwave devices that are being discontinued including all RF Switches and most of the Low Noise GaAs FETs (pHEMTs) - see specific part number replacements in the table below.

The complete End of Life (EOL) list of parts is shown below.

PCN#	Release Date dd-mmm-yy	Renesas EOL Part Number	CEL Drop-In Replacement Part	Last Time Buy Forecast Date	Last Time Buy Date	Last Time Ship Date
RFL20160805D	5-Aug-16	NE3210S01	CE3512K2	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3210S01-T1B	CE3512K2-C1	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3503M04-A	CE3514M4	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3503M04-T2-A	CE3514M4-C2	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3503M04-T2B-A	CE3514M4-C2	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3508M04-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3508M04-T2-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3509M04-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3509M04-T2-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3510M04-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3510M04-T2-A	NA	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3511S02-A	CE3512K2	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3511S02-T1C-A	CE3512K2-C1	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3512S02-A	CE3512K2	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3512S02-T1C-A	CE3512K2-C1	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3512S02-T1D-A	CE3512K2-C1	15-Dec-16	1-Jun-17	1-Jun-18
RFL20160805D	5-Aug-16	NE3513M04-A	CE3514M4	15-Dec-16	1-Jun-17	1-Jun-18

NE3511S02 vs. CE3512K2

RENESAS

DATA SHEET

HETERO JUNCTION FIELD EFFECT TRANSISTOR NE3511S02

X TO Ku BAND SUPER LOW NOISE AMPLIFIER
N-CHANNEL HJ-FET

FEATURES

- Super low noise figure and high associated gain
NF = 0.30 dB TYP., $G_a = 13.5$ dB TYP. @ $f = 12$ GHz
- Micro-X plastic (S02) package

APPLICATIONS

- X to Ku-band DBS LNB
- Other X to Ku-band communication systems

ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Marking	Supplying Form
NE3511S02-T1C	NE3511S02-T1C-A	S02 (Pb-Free)	2 kpcs/reel	B	• 8 mm wide embossed taping • Pin 4 (Gate) faces the perforation side of the tape
NE3511S02-T1D	NE3511S02-T1D-A		10 kpcs/reel		

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order: NE3511S02

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	4	V
Gate to Source Voltage	V_{GS}	-3	V
Drain Current	I_D	I_{DSS}	mA
Gate Current	I_{GS}	100	μA
Total Power Dissipation	P_{tot} ^{Note}	165	mW
Channel Temperature	T_{ch}	+125	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +125	$^\circ\text{C}$

Note Mounted on 1.08 cm² × 1.0 mm (t) glass epoxy PCB

CEL

RF Low Noise FET CE3512K2

12 GHz Super Low Noise FET in Hollow Plastic PKG

DESCRIPTION

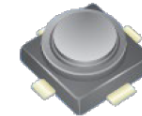
- Super Low Noise and High Gain
- Hollow (Air Cavity) Plastic package

PACKAGE

- Micro-X plastic package

FEATURES

- Super Low noise figure and high associated gain:
NF = 0.30 dB TYP., $G_a = 13.7$ dB TYP.
@ $V_{DS} = 2$ V, $I_D = 10$ mA, $f = 12$ GHz



ABSOLUTE MAXIMUM RATINGS

($T_A = +25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DS}	4.0	V
Gate to Source Voltage	V_{GS}	-3.0	V
Drain Current	I_D	I_{DSS}	mA
Gate Current	I_{GS}	80	μA
Total Power Dissipation	P_{tot}	125	mW
Channel Temperature	T_{ch}	+150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +125	$^\circ\text{C}$
Operation Temperature	T_{op}	-55 to +125 ^{Note}	$^\circ\text{C}$

Note Refer to Total Power Dissipation vs. Ambient Temperature graph on page 4

APPLICATIONS

- KU Band LNB (Low Noise Block)
Suitable for 1st Stage

ORDERING INFORMATION

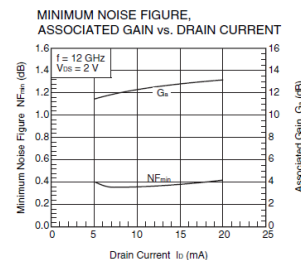
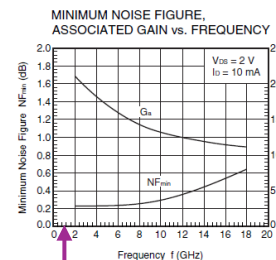
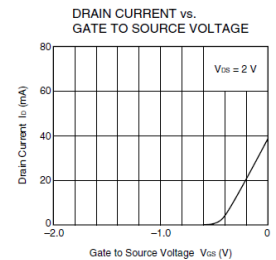
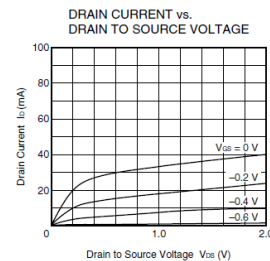
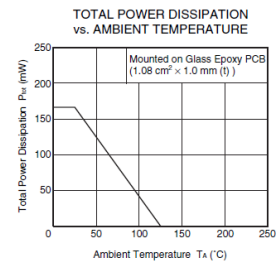
Part Number	Order Number	Package	Marking	Description
CE3512K2	CE3512K2-C1	Micro-X plastic package	C5	• Embossed tape 8 mm wide • Pin 4 (Gate) faces the perforation side of the tape • MOQ 10 kpcs/reel

NE3511S02 vs. CE3512K2

NEC

NE3511S02

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)



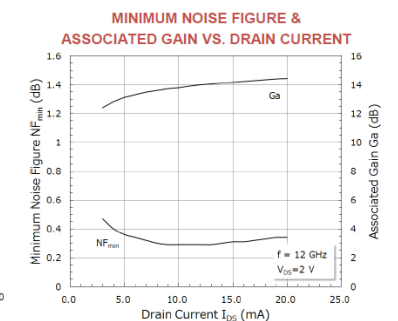
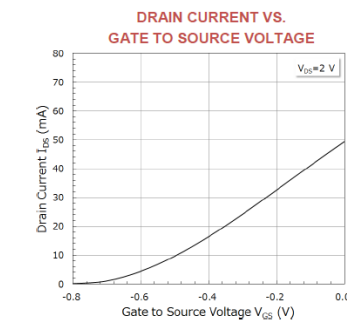
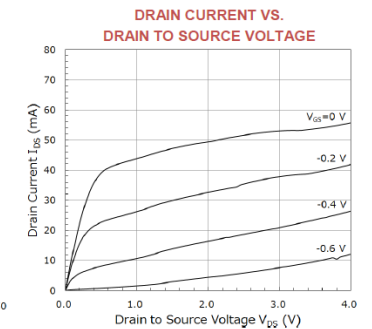
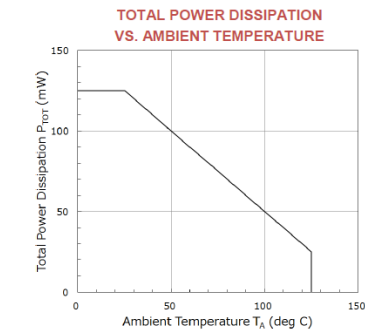
Remark The graphs indicate nominal characteristics.

@ 1.2GHz:
Gain ~ 22dB
NF ~0.25dB

CEL

CE3512K2

TYPICAL CHARACTERISTICS :
($T_A = +25^\circ\text{C}$, unless otherwise specified)



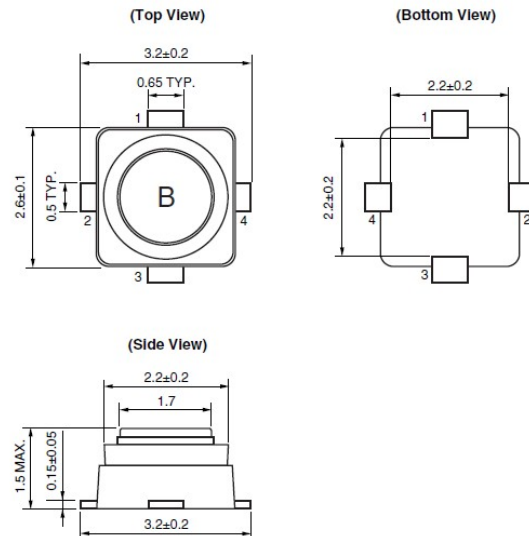
NE3511S02 vs. CE3512K2

NEC

NE3511S02

PACKAGE DIMENSIONS

S02 (UNIT: mm)



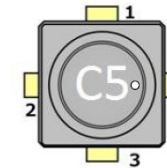
PIN CONNECTIONS

1. Source
2. Drain
3. Source
4. Gate

CEL

CE3512K2

PIN CONFIGURATION AND INTERNAL BLOCK DIAGRAM



Pin No.	Pin Name
1	Source
2	Drain
3	Source
4	Gate

NE3511S02/CE3512K2 availability

The screenshot shows the Mouser Electronics website's shopping basket. At the top, there's a navigation bar with the Mouser logo, a search bar, and links for 'In Stock' and 'RoHS'. Below this is a blue header with navigation links: 'Products', 'Manufacturers', 'Services & Tools', 'Technical Resources', 'Help', and 'Account & Orders'. The main content area starts with a 'Continue Shopping' link and a 'SHOPPING BASKET' title. A banner for 'BANK HOLIDAY SHIPPING ARRANGEMENTS' is displayed, followed by links for 'Print This Page', 'Share', 'Export', 'New Basket', and 'Schedule'. A 'Login Now' button is present. Below this is a form to add items to the basket with fields for 'Mouser No / Mfr. No', 'Customer No', and 'Quantity', and an 'Add' button. The basket itself shows one item: 'RF JFET Transistors 12GHz NF 3dB Ga 13.7dB -55C +125C RoHS Compliant'. The item's availability is '10 Dispatches Now'. The unit price is 1,30 €, and the extended price is 13,00 €. A 'Checkout' button is at the bottom right of the item list. Below the item list, there's a section for terms and conditions, and a summary box showing 'Merchandise: 13,00 €', 'Shipping: FedEx International Priority 20,00 €', and a 'Subtotal: 33,00 €'. A final 'Checkout' button is at the bottom right of the summary box.

MOUSER ELECTRONICS

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SHOPPING BASKET

BANK HOLIDAY SHIPPING ARRANGEMENTS
Any order received after the close of business on Wednesday 27 November will not be shipped until Friday 29 November. We apologise for any inconvenience.

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[Login Now](#) to access saved baskets or to save this order as a project

Mouser No / Mfr. No	Customer No	Quantity	
			Add

1 - 1 of 1

Sort	Product Detail	Description	Quantity	Availability	Unit Price (EUR)	Ext. Price (EUR)	
1	 Mouser No: 551-CE3512K2 Mfr. No: CE3512K2 Mfr.: CEL Customer No:	RF JFET Transistors 12GHz NF 3dB Ga 13.7dB -55C +125C RoHS Compliant QuickView	10	10 Dispatches Now	1,30 €	13,00 €	X

By submitting your order you agree to these [terms and conditions](#).
For additional information on availability, click on the Mouser Part No.

Incoterm: DDP is available to customers in EU Member States.
All Prices [include](#) duty and customs fees on select shipping methods.

Merchandise:	13,00 €
Shipping:	FedEx International Priority 20,00 €
Online orders ship Today Expected Arrival December 02 - December 02 + More Delivery Options	
Subtotal:	33,00 €

NE3511S02 is not available anymore (apart from some not-so-reliable suppliers in china).

CE3512K2 is hard to find but available at a few “serious” places:

- Mouser
- Digikey
- ...

MGA-82563

MGA-82563

0.1 – 6 GHz 3 V, 17 dBm Amplifier

Data Sheet

Description

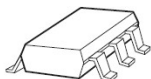
Avago's MGA-82563 is an economical, easy-to-use GaAs MMIC amplifier that offers excellent power and low noise figure for applications from 0.1 to 6 GHz. Packaged in an ultra-miniature SOT-363 package, it requires half the board space of a SOT-143 package.

The input and output of the amplifier are matched to 50 Ω (below 2:1 VSWR) across the entire bandwidth, eliminating the expense of external matching. The amplifier allows a wide dynamic range by offering a 2.2 dB NF coupled with a +31 dBm Output IP₃.

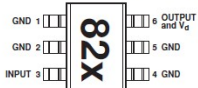
The circuit uses state-of-the-art PHEMT technology with proven reliability. On-chip bias circuitry allows operation from a single +3 V power supply, while resistive feedback ensures stability (K>1) over all frequencies and temperatures.

Surface Mount Package

SOT-363 (SC-70)



Pin Connections and Package Marking



Note: Package marking provides orientation and identification.
"82" = Device Code
"x" = Date code character identifies month of manufacture



MGA-82563 Absolute Maximum Ratings

Symbol	Parameter	Units	Absolute Maximum ⁽¹⁾
V _d	Device Voltage, RF Output to Ground	V	5.0
V _{gs}	Device Voltage, Gate to Drain	V	-6.0
V _{in}	Range of RF Input Voltage to Ground	V	+0.5 to -1.0
P _{in}	CW RF Input Power	dBm	+13
T _{ch}	Channel Temperature	°C	165
T _{stg}	Storage Temperature	°C	-65 to 150

Thermal Resistance⁽²⁾:
 $\theta_{ch-c} = 180^{\circ}\text{C/W}$

Notes:

1. Permanent damage may occur if any of these limits are exceeded.
2. T_c = 25°C (T_c is defined to be the temperature at the top of the package.)

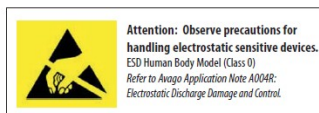
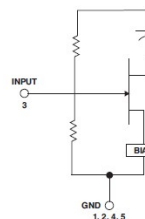
Features

- Lead-free Option Available
- +17.3 dBm P_{1dB} at 2.0 GHz
- +20 dBm P_{sat} at 2.0 GHz
- Single +3V Supply
- 2.2 dB Noise Figure at 2.0 GHz
- 13.2 dB Gain at 2.0 GHz
- Ultra-miniature Package
- Unconditionally Stable

Applications

- Buffer or Driver Amp for PCS, PHS, ISM, SATCOM and WLL Applications
- High Dynamic Range LNA

Simplified Schematic



MGA-82563 Electrical Specifications, T_c = 25°C, Z₀ = 50 Ω , V_d = 3 V

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.	Std Dev ⁽²⁾
G _{test}	Gain in test circuit ⁽¹⁾	f = 2.0 GHz	12.0	13.2	15	0.35
NF _{test}	Noise Figure in test circuit ⁽¹⁾	f = 2.0 GHz		2.2	2.9	0.20
NF ₅₀	Noise Figure in 50 Ω system	f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dB	2.3 2.2 2.2 2.2 2.4 2.7		0.20
S ₂₁ ²	Gain in 50 Ω system	f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dB	14.7 14.5 13.5 12.1 10.7 8.8		0.35
P _{1 dB}	Output Power at 1 dB Gain Compression	f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dBm	17.4 17.5 17.3 17.1 17.0 16.8		0.54
IP ₃	Output Third Order Intercept Point	f = 2.0 GHz	dBm	+31		1.0
VSWR _{in}	Input VSWR	f = 0.2–5.0 GHz		1.8:1		
VSWR _{out}	Output VSWR	f = 0.2–5.0 GHz		1.2:1		
I _d	Device Current		mA	63	84	101

Notes:

1. Guaranteed specifications are 100% tested in the circuit in Figure 10 in the Applications Information section.
2. Standard deviation number is based on measurement of at least 500 parts from three non-consecutive wafer lots during the initial characterization of this product, and is intended to be used as an estimate for distribution of the typical specification.

MGA-82563 Typical Performance, T_c = 25°C, V_d = 3 V

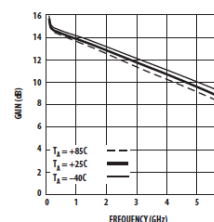


Figure 1. 50 Power Gain vs. Frequency and Temperature.

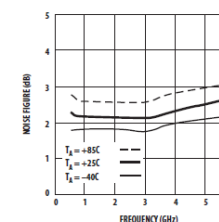


Figure 2. Noise Figure (into 50) vs. Frequency and Temperature.

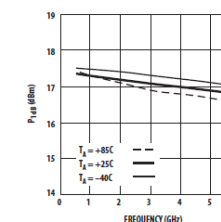


Figure 3. Output Power @ 1 dB Gain Compression vs. Frequency and Temperature.

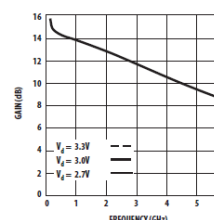


Figure 4. 50 Power Gain vs. Frequency and Voltage.

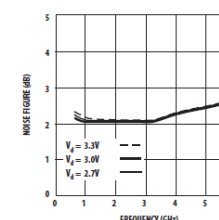


Figure 5. Noise Figure (into 50) vs. Frequency and Voltage.

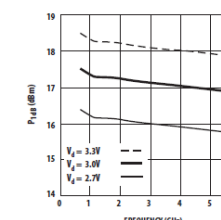


Figure 6. Output Power @ 1 dB Gain Compression vs. Frequency and Voltage.

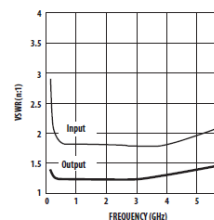


Figure 7. Input and Output VSWR into 50 vs. Frequency.

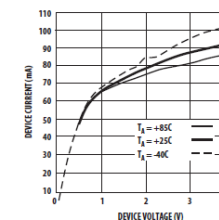


Figure 8. Device Current vs. Voltage and Temperature.

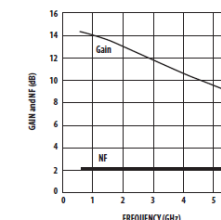


Figure 9. Minimum Noise Figure and Associated Gain vs. Frequency.