



MXD8015L

LTE Low Band Low Noise Amplifier



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General Description

MXD8015L high gain, low noise amplifier (LNA) is dedicated to LTE low band receive. This product has excellent noise figure of 0.7dB noise figure and 16dB gain.

MXD8015L works under a 1.6V to 3.0V single power supply while consumes 5.5 mA current, in power down (PD) mode, the power consumption will be reduced to less than 1uA.

MXD8015L uses a small 1.1mmx0.7mmx0.45mm LGA 6-pin package.

Features

- Low noise figure 0.7 dB at 716MHz to 960MHz
- Low operation current 5.5 mA & PD current less than 1uA
- Single supply voltage range 1.6V to 3.0V
- Small package 1.1mmx0.7mmx0.45mm , MSL1
- Low cost BOM
- Lead-Free and RoHS-Compliant

Applications

LTE DRX
Cell Phone with LTE
MID/PAD with LTE

Pin Configuration/Application Diagram (Top view)

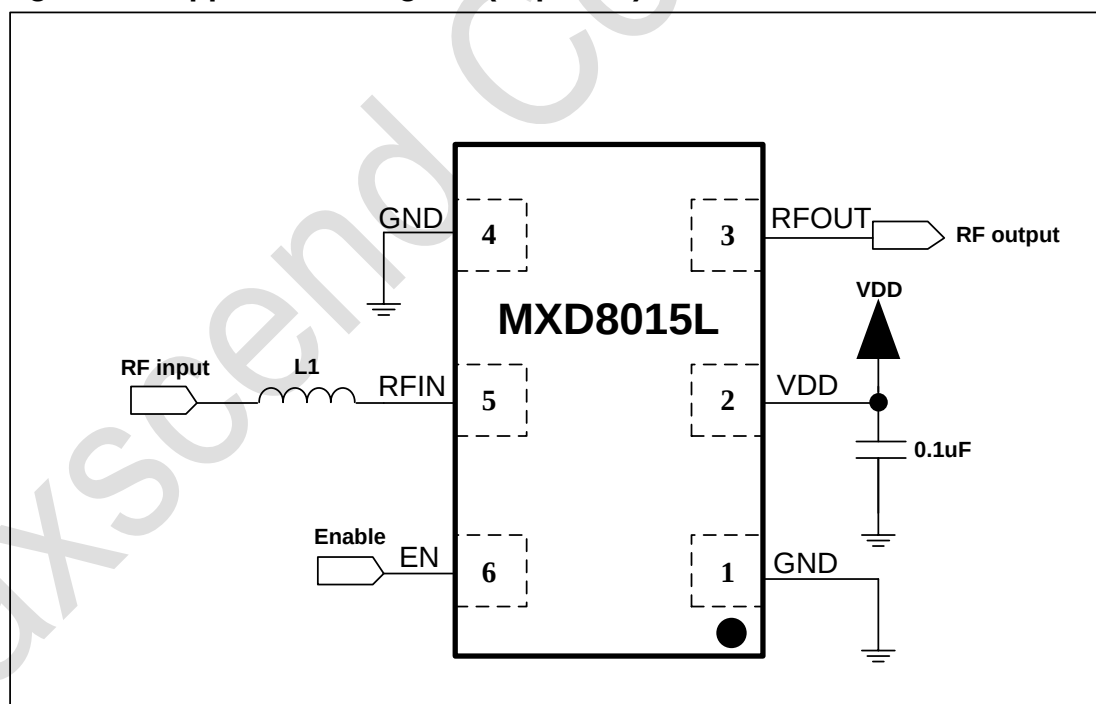


Figure 1.MXD8015L application circuit

Table 1.

Component	Vendor	Type	Part Number & value
L1	Murata	Wired inductor, high Q	LQW15AN20N, 20nH
	various	Ceramic inductor, low Q	15nH

Absolute Maximum Ratings

Table 2.

Parameters	Range	Units
Power supply	-0.3 ~ 3.3	V
Other Pin to GND	-0.3~VDD+0.3	V
Maximum RF Input Power	10	dBm
Operation Temperature Range	-40~90	°C
Junction Temperature	150	°C
Storage temperature Range	-65~160	°C
Lead Temperature (soldering)	260	°C
Soldering Temperature (reflow)	260	°C
Human Body Mode ESD	-1500~+1500	V
Machine Mode ESD	-125~+125	V
Charge Device Mode ESD	-500~+500	V

Specifications

DC Characteristics

Typically $T_A=25^{\circ}\text{C}$ VDD=2.8V, unless otherwise noted

Table 3.

Parameters	Condition	Min	Typ	Max	Units
Supply Voltage		1.6	2.8	3.0	V
Supply Current	EN=High, VDD=2.8V		5.5		mA
	EN=Low			1	uA
EN Input High		1.0	1.8	VDD	V
EN Input Low		0	0	0.3	V

AC Characteristics

Typically $T_A=25^{\circ}\text{C}$ VDD=2.8V, all data measured on Maxscend's EVB, unless otherwise noted

Table 4. AC Specifications 716MHz-850MHz

Parameters	Conditions	Min	Typ	Max	Units
RF Frequency Range	None	716	-	850	MHz
Operation Current			5.5		mA
Power Down Current				1	uA
Power Gain		14	16	18	dB
Noise Figure ¹	Note1	-	0.65	1.05	dB
Input Return Loss		-	-10	-6	dB
Output Return Loss		-	-10	-6	dB
Reverse Isolation		-	-25	-20	dB
Stability		1.5	-	-	-
Input Power 1-dB Compression Point		-4	0	-	dBm
Inband input 3 rd - order intercept point ²	Note2	-4	1	-	dBm
Settling time	Off to operation	-	2	3	us

Note 1: PCB loss is subtracted

Note 2: f1 = 790MHz, f2 = 791MHz, p1 = p2 = -25dBm

Table 5. AC Specifications 850MHz-960MHz

Parameters	Conditions	Min	Typ	Max	Units
RF Frequency Range	None	850	–	960	MHz
Operation Current			5.5		mA
Power Down Current				1	uA
Power Gain		14	16	18	dB
Noise Figure ¹	Note1	–	0.7	1.1	dB
Input Return Loss		-	-10	-6	dB
Output Return Loss		-	-10	-6	dB
Reverse Isolation		–	-25	-20	dB
Stability		1.5	–	–	–
Input Power 1-dB Compression Point		-3	1	–	dBm
Inband input 3 rd – order intercept point ²	Note2	-3	2	–	dBm
Settling time	Off to operation	–	2	3	us

Note 1: PCB loss is subtracted

Note 2: f1 = 900MHz, f2 = 901MHz, p1 = p2 = -25dBm

Pin Descriptions

Table 6. Pin Descriptions

Pin	Pin Name	I/O	Pin Description
1	GND	AG	Analog VSS
2	VDD	AP	Power supply, 1.6~3.0V
3	RFOUT	AO	LNA output
4	GND	AG	Analog VSS
5	RFIN	AI	LNA input from antenna
6	EN	DI	Pull high enable, pull low into power down mode

Note: DI (digital input), DO (digital output), DIO (digital bidirectional), AI (analog input), AO (analog output), AIO (analog bidirectional), AP (analog power), AG (analog ground),

Outline Dimensions

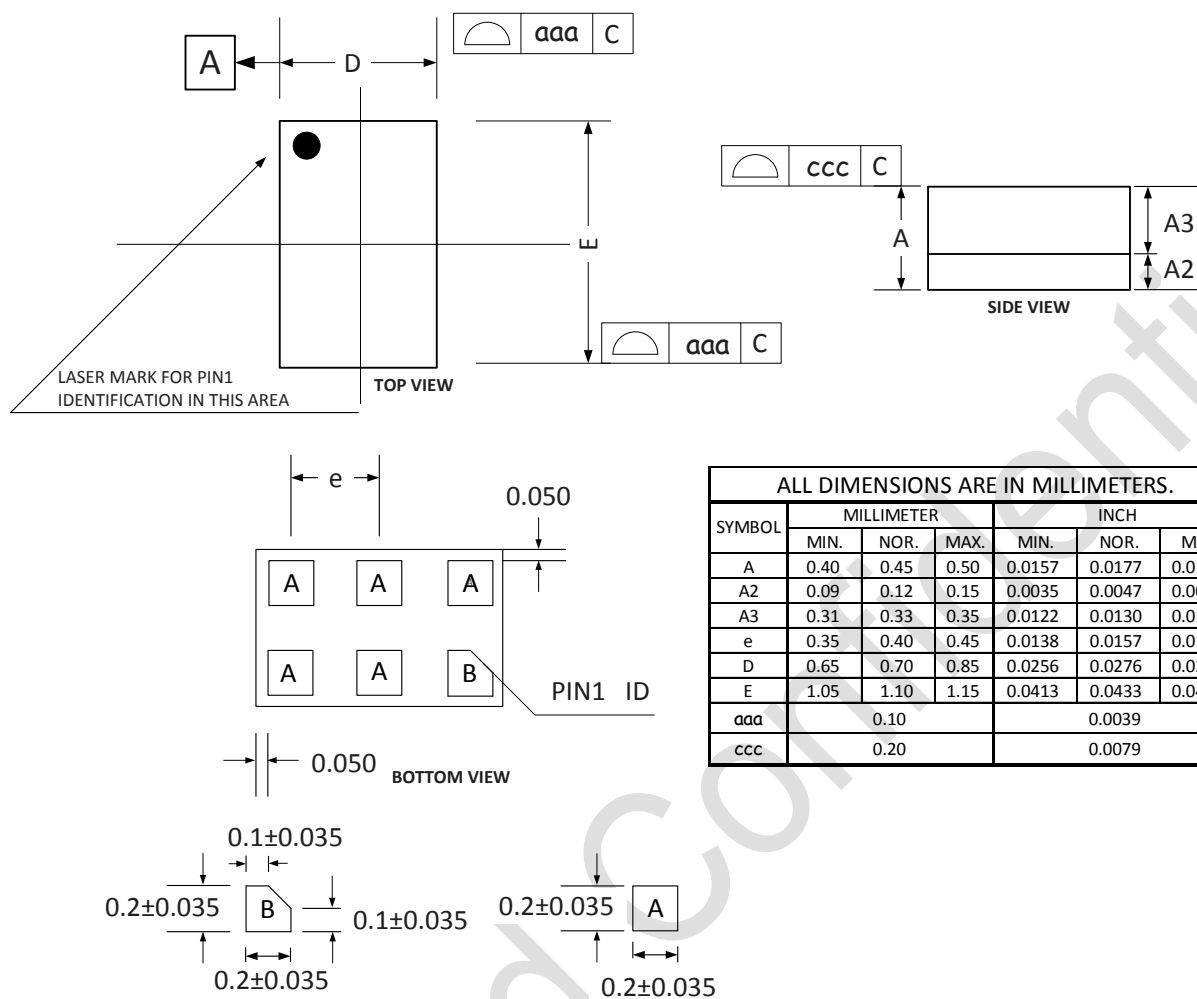


Figure 2. MXD8015L outline dimension

Marking Specification

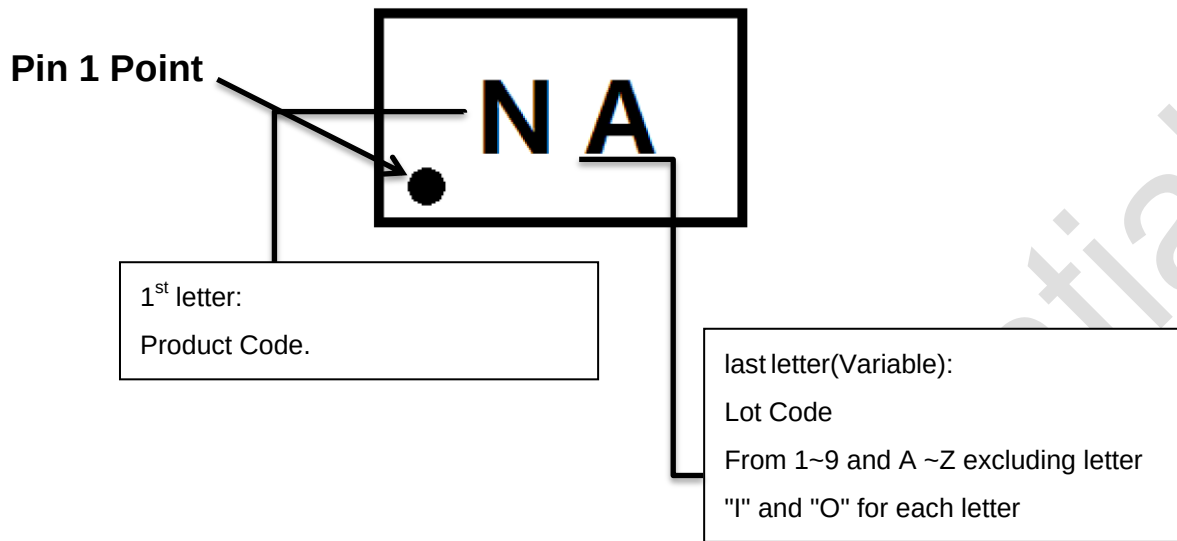


Figure 3. Marking specification (Top View)

Tape and Reel Dimensions

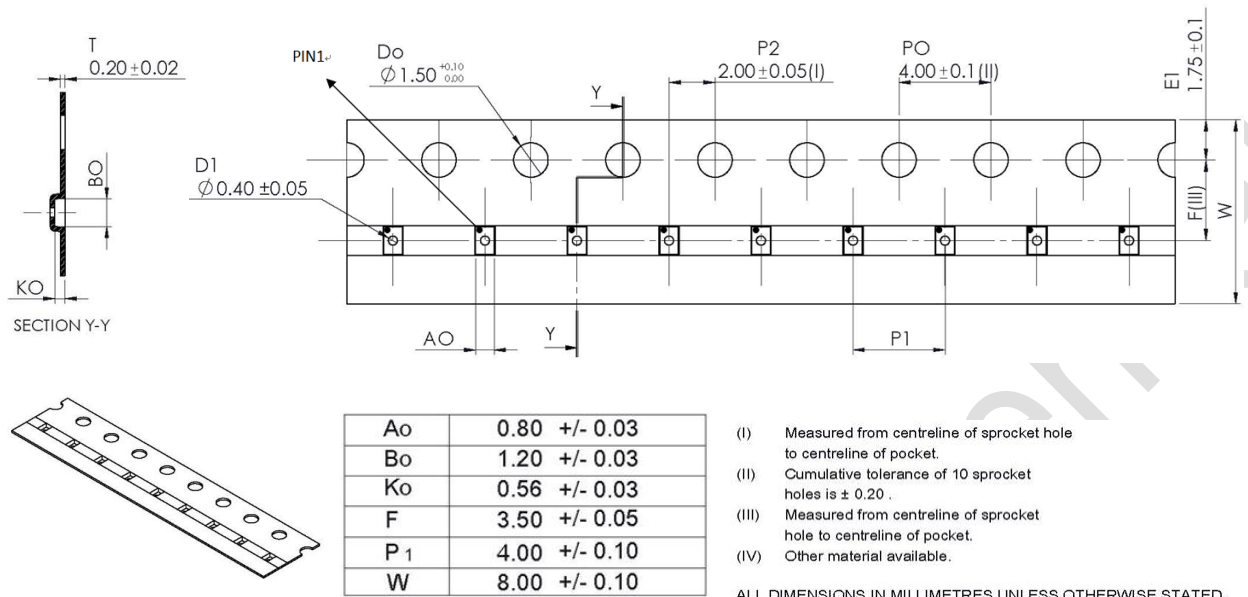


Figure 4. Tape and reel dimensions

Reflow Chart

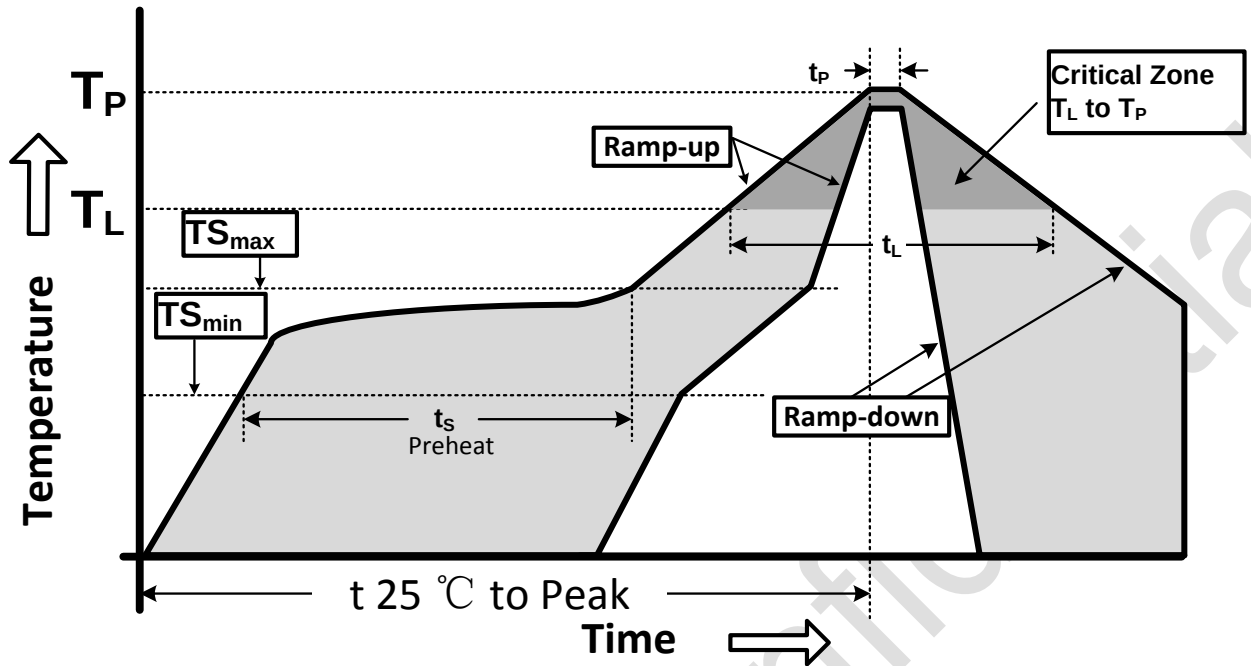


Figure 5. Recommended Lead-Free Reflow Profile

Table 7. Reflow condition

Profile Parameter	Lead-Free Assembly, Convection, IR/Convection
Ramp-up rate (TS _{max} to T _p)	3°C/second max.
Preheat temperature (TS _{min} to TS _{max})	150°C to 200°C
Preheat time (t _s)	60 - 180 seconds
Time above T _L , 217°C (t _L)	60 - 150 seconds
Peak temperature (T _p)	260°C
Time within 5°C of peak temperature(t _p)	20 - 40 seconds
Ramp-down rate	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

ESD Sensitivity

Integrated circuits are ESD sensitive and can be damaged by static electric charge. Proper ESD protection techniques should be used when handling these devices.

RoHS Compliant

This product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE), and are considered RoHS compliant.