neoway

Get connected Get smart

A70 Series

Product Specifications

Issue 1.4 Date 2019-10-22

Notice

This document provides guide for users to use A70 Series.

This document is intended for system engineers (SEs), development engineers, and test engineers.

THIS GUIDE PROVIDES INSTRUCTIONS FOR CUSTOMERS TO DESIGN THEIR APPLICATIONS. PLEASE FOLLOW THE RULES AND PARAMETERS IN THIS GUIDE TO DESIGN AND COMMISSION. NEOWAY WILL NOT TAKE ANY RESPONSIBILITY OF BODILY HURT OR ASSET LOSS CAUSED BY IMPROPER OPERATIONS.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE DUE TO PRODUCT VERSION UPDATE OR OTHER REASONS.

EVERY EFFORT HAS BEEN MADE IN PREPARATION OF THIS DOCUMENT TO ENSURE ACCURACY OF THE CONTENTS, BUT ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS DOCUMENT DO NOT CONSTITUTE A WARRANTY OF ANY KIND, EXPRESS OR IMPLIED.

Neoway provides customers complete technical support. If you have any question, please contact your account manager or email to the following email addresses:

Sales@neoway.com

Support@neoway.com

Website: http://www.neoway.com

Contents

Table of Figures

Table of Tables

About This Document

Scope

This document is applicable to A70 Series.

It defines the features, indicators, and test standards of the modules.

Audience

This document is intended for system engineers (SEs), development engineers, and test engineers.

Change History

Issue	Date	Change	Changed By
1.0	2017-09	Initial draft	Li Huixiang
1.1	2017-12	• Added WCDMA B5 • Updated pin definition • Updated Table 1-2 • Updated dimensions of A70 and application PCB figure.	Li Huixiang
1.2	2018-03	• Added A70V3 • Added GNSS features • Added currents in flight mode and sleep mode • Added operating temperature range and modified the storage temperature range • Updated the block diagram	Li Huixiang
1.3	2018-09	• Modified the pin definition according to Neoway Module Pin Definition. • Added variant information • Deleted IO type of P6 and added P8 • Changed the default function of S4 to GPIO_43	Li Huixiang

1.4	2019-09	• Updated the configurations and the frequency bands of the variants of A70 series. • Added the hardware configuration information of A70 series.	Zheng Chengxing

Conventions

Symbol	Indication
	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
	Means note or tips for readers to use the module

Related Documents

*Neoway*_A70 Series_*Datasheet*

*Neoway*_A70 Series_*Product_Specifications*

*Neoway*_A70 Series_*AT_Command_Mannual*

*Neoway*_A70 Series_*EVK_User_Guide*

1 About A70

A70 series are a set of LTE modules that are developed on Qualcomm platform. They are applicable to different application scenarios.

A70 in this document refers to A70, A70V2, and A70V3 if not specified.

1.1 Product Overview

A70 series include multiple variants. Table 1-1 lists the hardware configuration information and Table 1-2 lists the variants and frequency bands supported.

Table 1-1 Hardware Configuration information

	A70	A70V2	A70V3
Hardware Platform	MDM9628 (Automotive-grade[1])	MDM9607 (Industrial-grade)	MDM9628 (Industrial-grade)
FLASH	Automotive-grade	Consumer-grade	Industrial-grade

[1]Automotive-grade RF: the OEMs of key RF components declare that the component complies with automotive-grade standard or they can provide PPAP report as required.

Table 1-2 Variant and frequency bands

Model	Variant	Category	Band	Baseband Chipset	RF	GNSS	CODEC	Antenna Switch
A70	CN	Cat4	LTE FDD: B1, B3, B5, B8, B26[2] LTE TDD: B34, B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B5, B8 EV-DO: BC0 CDMA 1x BC0 GSM/GPRS/EDGE: 900/1800 MHz	MDM9628	Automotive-grade	Optional	Optional	Optional
A70V2	CN	Cat4	LTE FDD: B1, B3, B5, B8, B26 LTE TDD: B34, B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B5, B8 EV-DO: BC0 CDMA 1x BC0 GSM/GPRS/EDGE: 900/1800 MHz	MDM9607	Industrial-grade	Optional	Optional, not supported by default	Optional, not supported by default
A70V3	CN	Cat4	LTE FDD: B1, B3, B5, B8, B26 LTE TDD: B34, B38, B39, B40, B41 TD-SCDMA: B34, B39 UMTS: B1, B5, B8 EV-DO: BC0 CDMA 1x BC0 GSM/GPRS/EDGE: 900/1800 MHz	MDM9628	Industrial-grade	Optional	Optional, not supported by default	Optional, not supported by default

[2] The frequency band is optional.

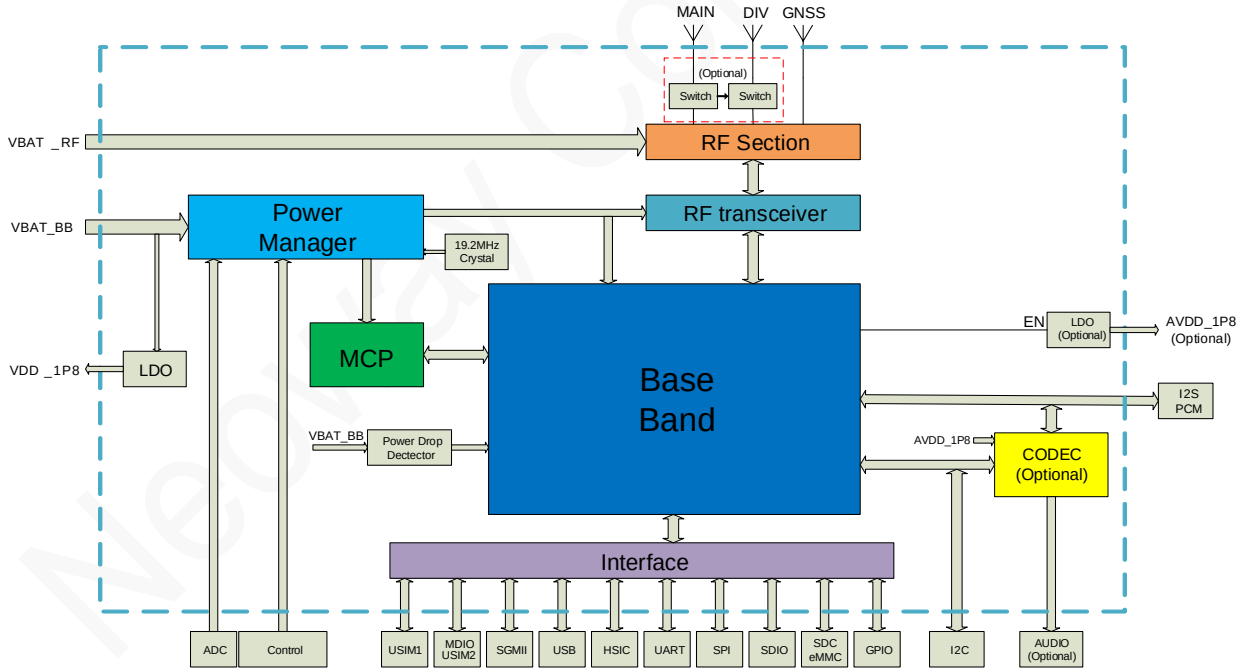
A70 adopts 284-pin LGA package and its dimensions are 37 mm x 37 mm x 2.7 mm. With automotive-grade performance, this module is well applicable to in-vehicle OEM applications.

1.2 Block Diagram

A70 consists of the following functionality modules:

- Baseband and memory
- Crystal oscillation and power (VBAT_BB, VBAT_RF, VDD_1P8, AVDD_1P8, voltage drop detection)
- Digital interfaces (USIM, USB, HSIC, UART, SPI, SDIO, SDC/eMMC, GPIO, I2C, I2S/PCM and SGMII))
- Analog interfaces (ADC)
- Analog audio interfaces (optional)
- RF interfaces (main antenna, diversity antenna, GNSS antenna, antenna switch)

Figure 1-1 Block Diagram



1.3 Basic Features

Parameter	Description	
Physical features	• Dimensions: (37.0±0.1) mm × (37.0±0.1) mm × (2.7±0.2) mm • Package: 284-pin LGA • Weight: around 8.4g	
Temperature ranges	Operating: -30°C to +75°C Extended: -40°C to +85°C[3] Storage: -45°C to +105°C	
Operating voltage	VBAT_BB: 3.4V to 4.2V, TYP: 3.8V VBAT_RF: 3.4V to 4.2V, TYP: 3.8V	
Current[4]	Flight mode	1.24mA
	Sleep Mode	GSM DRX=6: 2.2 mA GSM DRX=9: 1.45 mA WCDMA DRX=2: 2 mA WCDMA DRX=9: 1.54 mA LTE (Paging Cycle 320ms): 6.5 mA LTE (Paging Cycle 2.56s): 1.67 mA
	Operating Current	VBAT_BB: 1.5A MAX VBAT_RF: 2.5A MAX VBAT_BB+VBAT_RF: 3A MAX[5]
MIPS processor	ARM Cortex-A7 processor, 1.3 GHz main frequency, 256kB L2 cache	
Memory	RAM: 256MB ROM: 512MB	
Band	See Table 1-1.	
Wireless data rate	GPRS: Max 85.6 Kbit/s(DL) / Max 85.6 Kbit/s(UL) EDGE: Max 236.8 Kbit/s(DL) / Max 236.8 Kbit/s(UL) CDMA2000@1x, 1xEV-DOrA: Max 3.1 Mbit/s (DL) / Max 1.8Mbit/s (UL) TD-SCDMA: Max 4.2 Mbit/s (DL)/Max 2.2 Mbit/s (UL) WCDMA: DC-HSPA+, Max 42Mbit/s(DL)/Max 5.76Mbit/s(UL) FDD-LTE: non-CA cat4, Max 150 Mbit/s(DL)/Max 50 Mbit/s (UL) TDD-LTE: non-CA cat4, Max 130 Mbit/s(DL)/Max 35 Mbit/s(UL)	
Transmit power	EGSM900: +33dBm (Power Class 4) DCS1800: +30dBm (Power Class 1)	

[3] RF performance might not meet 3GPP/3GPP2 standards in extended temperature but it does not affect functioning.

[4] Indicates current features of A70CN. For current features of other variants, see Chapter 4.

[5] indicates that VBAT_BB and VBAT_RF share one power supply.

	EDGE 900MHz: +27dBm (Power Class E2) EDGE1800MHz: +26dBm (Power Class E2) TD-SCDMA: +23 dBm (Power Class 3) CDMA 1X/EVDO: +23 dBm (Power Class 3) UMTS: +23 dBm (Power Class 3) LTE: +23dBm (Power Class 3)
Application Interfaces	2G/3G/4G antenna, 4G diversity antenna, GNSS antenna, 50Ω impedance
	Two UART interfaces, at most 4 Mbit/s
	Two USIM interfaces, compatible with 1.8V/2.85V USIM cards, dual-SIM single-standby
	One USB2.0 high-speed interface
	One HSIC interface, used to connect high-speed chipset
	Three 15-bit ADC interfaces, detectable voltage ranging from 0.1 to 1.7V.
	One SPI interface, maximum frequency of 50MHz, support host mode only
	One SDIO interface, used to control WLAN
	One dual-voltage SD3.0 interface, used to control SD card or 4-bit eMMC chipset
	One I2S interface, used for digital audio transmission or configured as PCM interface
	One I2C interface, used to control external sensor, host mode only
	One SGMII interface, used to connect to Ethernet PHY chipset
	One MDIO interface, used to control PHY chipset (multiplexed from USIM2)
	Two analog audio input interfaces (only supported by variants with CODEC chipset)
	Two analog audio output interfaces (only supported by variants with CODEC chipset)
	One analog power output interface (only supported by variants with CODEC chipset)
	One general power output interface, typically output 1.8V, a maximum current of 200 mA.
	13 GPIO pins, five among which support interrupt.
AT commands	3GPP Release 13 Neoway extended commands
Emergency response	ERA-GLONASS, eCall (only for A70 and A70V3)
Dedicated in-vehicle	DSRC-V2V, V2P 802.11p (only for A70 and A70V3, requiring a third-party module)

communications technology	
SMS	PDU, TXT
Data	PPP, RNDIS, ECM, RMNET
Protocol	TCP, UDP, MQTT, FTP/FTPS, HTTP/HTTP(S), SSL, TLS
Certification approval	CCC, SRRC, CTA, RoSH

2 Compliant Standards

A70 complies with the following standards:

- 3GPP TS 07.07 *AT command set for GSM Mobile Equipment (ME)*
- ISO16750 Road vehicles—Environmental conditions and testing for electrical and electronic equipment
- YD 1214-2006 *Technical requirement of 900/1800MHz TDMA Digital Cellular Mobile Telecommunication Network General Packet Radio Service (GPRS)Equipment: Mobile Stations*
- YD 1215-2006 *Testing Methods of 900/1800MHz TDMA Digital Cellular Mobile Telecommunication Network General Packet Radio Service (GPRS)Equipment: Mobile Stations*
- YD 1032-2000 *Limits and Measurement Methods of Electromagnetic Compatibility for 900/1800MHz Digital Cellular Telecommunications System Part1:Mobile Station and Ancillary Equipment*
- YD/T 2220-2011 *Technical Requirement and test method of WCDMA/GSM(GPRS) dual mode digit mobile user equipment (phase 4)*
- Ministry of Industry and Information Technology PRC, *Measures for the Network Access Management of Telecommunication Equipment (2014 Amendment)*
- GB4943.1-2011 *Information technology equipment - Safety - Part 1: General requirements*
- GB/T22450.1-2008 *Limits and measurement methods of electromagnetic compatibility for 900/1800MHz TDMA digital cellular telecommunications system - Part 1: Mobile station and ancillary equipment*
- CNCA-O7C-031:2007 *Rules for Compulsory Certification of Telecommunication Equipment Telecommunication Terminal Equipment*
- 3GPP TS GSM Specification Set
- 3GPP TS WCDMA Specification Set
- CDMA2000@1x,1xAdvanced,1xEV-DOrA Specification Set
- 3GPP TS LTE Cat4 4G Specification Set

3 Module Pins

There are 284 pins on A70 and their pads are introduced in LGA package.

3.1 Pad Layout

Figure 3-1 shows the pad layout of A70.

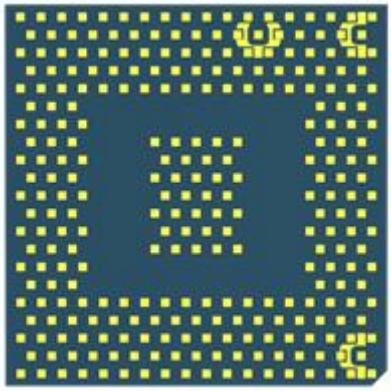
Figure 3-1 Pin Definition

3.2 Appearance

Figure 3-2 and Figure 3-3 show the top view and bottom view of A70.

Figure 3-2 Top view of A70

Figure 3-3 Bottom of A70



The difference among A70V2, A70V3 and A70 is label. For more details, refer to Chapter 6.2.

4 Electric Feature and Reliability

4.1 Electric Features

Table 4-1 Operating conditions of A70

Status		Minimum	Typical	Maximum
VBAT_BB	V_{in}	3.4V	3.8V	4.2V
	I_{in}	/	/	1.5A
VBAT_RF	V_{in}	3.4V	3.8V	4.2V
	I_{in}	/	/	2.5A
VBAT_BB VBAT_RF	V_{in}	3.4V	3.8V	4.2V
	I_{in}	/	/	3A

Table 4-2 Current consumption of A70

Variant	Status	Test Conditions	Test Result (Typ)	Unit
CN	Power OFF	Shut down the module.	20	μA
	Sleep Mode	GSM900 DRX=2	1.9	mA
		GSM900 DRX=9	1.3	mA
		WCDMA DRX=2	2	mA
		LTE Paying cycle = 320ms	6.5	mA
		LTE Paying cycle = 640ms	3.8	mA
		LTE Paying cycle = 1.28s	2.4	mA
		LTE Paying cycle = 2.56s	1.67	mA
	Active Mode	GSM900 Voice Call PCL=5	245	mA
		GSM1800 Voice Call PCL=0	201	mA
		GPRS900 1DL/4UL PCL=5	459	mA
		GPRS1800 1DL/4UL PCL=0	327	mA
		EGPRS900 1DL/4UL PCL=8	418	mA
		EGPRS1800 1DL/4UL PCL=2	436	mA
		WCDMA Band1@ Max Tx power	510	mA
		WCDMA Band5@ Max Tx power	488	mA

		WCDMA Band8@ Max Tx power	417	mA
		LTE-FDD Band1@ Max Tx power	544	mA
		LTE-FDD Band3@ Max Tx power	531	mA
		LTE-FDD Band5@ Max Tx power	533	mA
		LTE-FDD Band8@ Max Tx power	528	mA
		LTE-FDD Band26@ Max Tx power	475	mA
		LTE-TDD Band34@ Max Tx power	255	mA
		LTE-TDD Band38@ Max Tx power	341	mA
		LTE-TDD Band39@ Max Tx power	268	mA
		LTE-TDD Band40@ Max Tx power	363	mA
		LTE-TDD Band41@ Max Tx power	367	mA
EU	Power OFF	TBD	TBD	μA
	Sleep Mode	TBD	TBD	mA
	Active Mode	TBD	TBD	mA
US	Power OFF	TBD	TBD	μA
	Sleep Mode	TBD	TBD	mA
	Active Mode	TBD	TBD	mA

- Test Result in above table indicates the total current consumption of VBAT_BB and VBAT_RF.
- Data in the table was obtained in test with instruments. LTE test conditions: 10 MHz bandwidth, QPSK modulation, uplink 50RB
- A70 in table heading refers to A70 only and does not include A70V2 and A70V3. For current consumption of A70V2 and A70V3, see Table 4-3 and Table 4-4 respectively.
- The values might change as software is optimized in later versions. If the values are different from those in Hardware Test report, the result is subject to the test report.

Table 4-3 Current features of A70V2

Variant	Status	Test Conditions	Test Result (Typ)	Unit
CN	Power OFF	TBD	TBD	μA
	Sleep Mode	TBD	TBD	mA
	Active Mode	TBD	TBD	mA

- Test Result in above table indicates the total current consumption of VBAT_BB and VBAT_RF.
- Data in the table was obtained in test with instruments. LTE test conditions: 10 MHz bandwidth, QPSK modulation, uplink 50RB
- The above table refers to A70V2.For current consumption of A70 and A70V3, see Table 4-2 and Table 4-4 respectively.
- The values might change as software is optimized in later versions. If the values are different from those in Hardware Test report, the result is subject to the test report.

Table 4-4 Current features of A70V3

Variant	Status	Test Conditions	Test Result (Typ)	Unit
CN	Power OFF	Shut down the module.	20	μA
	Sleep Mode	GSM900 DRX=2	1.9	mA
		GSM900 DRX=9	1.3	mA
		WCDMA DRX=2	2	mA
		LTE Paying cycle = 320ms	6.5	mA
		LTE Paying cycle = 640ms	3.8	mA
		LTE Paying cycle = 1.28s	2.4	mA
		LTE Paying cycle = 2.56s	1.67	mA
	Active Mode	GSM900 Voice Call PCL=5	245	mA
		GSM1800 Voice Call PCL=0	201	mA
		GPRS900 1DL/4UL PCL=5	439	mA
		GPRS1800 1DL/4UL PCL=0	407	mA
		EGPRS900 1DL/4UL PCL=8	418	mA
		EGPRS1800 1DL/4UL PCL=2	435.7	mA
		WCDMA Band1@ Max Tx power	510	mA
		WCDMA Band5@ Max Tx power	487.9	mA
		WCDMA Band8@ Max Tx power	417	mA
		LTE-FDD Band1@ Max Tx power	564	mA
		LTE-FDD Band3@ Max Tx power	605	mA
		LTE-FDD Band5@ Max Tx power	544	mA
		LTE-FDD Band8@ Max Tx power	440	mA
		LTE-FDD Band26@ Max Tx power	524	mA
		LTE-TDD Band34@ Max Tx power	289	mA
		LTE-TDD Band38@ Max Tx power	370	mA

	LTE-TDD Band39@ Max Tx power	251	mA
	LTE-TDD Band40@ Max Tx power	417	mA
	LTE-TDD Band41@ Max Tx power	375	mA

Test Result in above table indicates the total current consumption of VBAT_BB and VBAT_RF.

Data in the table was obtained in test with instruments. LTE test conditions: 10 MHz bandwidth, QPSK modulation, uplink 50RB

The above table refers to A70V3. For current consumption of A70 and A70V3, see Table 4-2 and Table 4-3 respectively.

The values might change as software is optimized in later versions. If the values are different from those in Hardware Test report, the result is subject to the test report.

4.2 Temperature Feature

Table 4-5 Temperature feature of A70

Status	Minimum Value	Typical Value	Maximum Value
Operating	-30℃	25℃	75℃
Extended	-40℃		85℃
Storage	-45℃		105℃

RF performance might not meet 3GPP/3GPP2 standards in extended temperature but it does not affect functioning.

4.2.1 ESD Protection

Electronics need to pass ESD tests. The following table shows the ESD capability of key pins of this module. It is recommended to add ESD protection based on the application scenarios to ensure product quality when designing a product.

Humidity 45% Temperature 25℃

Table 4-6 A70 ESD protection

Testing Point	Contact Discharge	Air Discharge
VBAT_BB	±8kV	±15kV

VBAT_RF	±8kV	±15kV
GND	±8kV	±15kV
ANT	±8kV	±15kV
Cover	±8kV	±15kV
Others	±2kV	±4kV

5 RF Features

5.1 Operating Bands

Table 5-1 Operating bands of A70

Operating Bands	Uplink	Downlink
EGSM900	880~915MHz	925~960MHz
DCS1800	1710~1785MHz	1805~1880MHz
CDMA BC0	824~849MHz	869~894MHz
WCDMA B1	1920~1980MHz	2110~2170MHz
WCDMA B5	824~849MHz	869~894MHz
WCDMA B8	880~915MHz	925~960MHz
TD-SCDMA B34	2010~2025MHz	2010~2025MHz
TD-SCDMA B39	1880~1920MHz	1880~1920MHz
FDD-LTE B1	1920~1980MHz	2110~2170MHz
FDD-LTE B3	1710~1785MHz	1805~1880MHz
FDD-LTE B5	824~849MHz	869~894MHz
FDD-LTE B8	880~915MHz	925~960MHz
FDD-LTE B26	814~849MHz	859~894MHz
TDD-LTE B34	2010~2025MHz	2010~2025MHz
TDD-LTE B38	2570~2620MHz	2570~2620MHz
TDD-LTE B39	1880~1920MHz	1880~1920MHz
TDD-LTE B40	2300~2400MHz	2300~2400MHz
TDD-LTE B41	2555~2655 MHz	2555~2655 MHz

5.2 TX Power and RX Sensitivity

Table 5-2 RF TX power of A70

Operating Band	Max Power	Min. Power
EGSM900	33dBm+2/-2dB	5dBm+2/-2dBm
DCS1800	30dBm+2/-2dB	0dBm+2/-2dBm
CDMA BC0	24dBm +1/-1dBm	<-50 dBm
WCDMA B1	24dBm +1/-3dBm	<-50 dBm
WCDMA B5	24dBm +1/-3dBm	<-50 dBm
WCDMA B8	24dBm +1/-3dBm	<-50 dBm
TD-SCDMA B34	24dBm +1/-3dBm	<-49 dBm
TD-SCDMA B39	24dBm +1/-3dBm	<-49 dBm
FDD-LTE B1	23dBm+2/-2dBm	<-40 dBm
FDD-LTE B3	23dBm+2/-2dBm	<-40 dBm
FDD-LTE B5	23dBm+2/-2dBm	<-40 dBm
FDD-LTE B8	23dBm+2/-2dBm	<-40 dBm
FDD-LTE B26	23dBm+2/-2dBm	<-40 dBm
TDD-LTE B34	23dBm+2/-2dBm	<-40 dBm
TDD-LTE B38	23dBm+2/-2dBm	<-40 dBm
TDD-LTE B39	23dBm+2/-2dBm	<-40 dBm
TDD-LTE B40	23dBm+2/-2dBm	<-40 dBm
TDD-LTE B41	23dBm+2/-2dBm	<-40 dBm

Table 5-3 RF RX sensitivity of A70

Operating Band	Sensitivity
EGSM900	≤-108dBm
DCS1800	≤-108dBm
CDMA BC0	<-107dBm
WCDMA B1	<-108 dBm
WCDMA B5	<-108 dBm
WCDMA B8	<-108 dBm
TD-SCDMA B34	<-109dBm
TD-SCDMA B39	<-109dBm

FDD-LTE B1	<-97dBm
FDD-LTE B3	<-95dBm
FDD-LTE B5	<-95dBm
FDD-LTE B8	<-95dBm
FDD-LTE B26	<-95dBm
TDD-LTE B34	<-97dBm
TDD-LTE B38	<-97dBm
TDD-LTE B39	<-97dBm
TDD-LTE B40	<-97dBm
TDD-LTE B41	<-95dBm

All the values above are obtained in the lab environment. LTE test conditions: 10 MHz bandwidth, QPSK modulation, uplink 50RB

In actual applications, there might be a difference due to the changes of test conditions and environment.

5.3 GNSS Feature

Changes	Parameter
GPS L1 operating frequency	1574.397~1576.443 MHz
GLONASS operating frequency	1597.5~1605.9MHz
BDS B1 operating frequency	1559.1~1563.1 MHz
Galileo operating frequency	1573.42~1577.42MHz
Tracking sensitivity	GPS: -158 dBm max
Acquisition sensitivity	GPS: -146dBm max
Re-acquisition sensitivity	GPS: -155 dBm max
Positioning precision (in air)	< 3m (CEP50)
Hot start (in air)	<2.5s
Cold start (in air)	<35s
Update frequency	1Hz by default
CNRin/CNRout	3dB
Max. positioning altitude	18000m

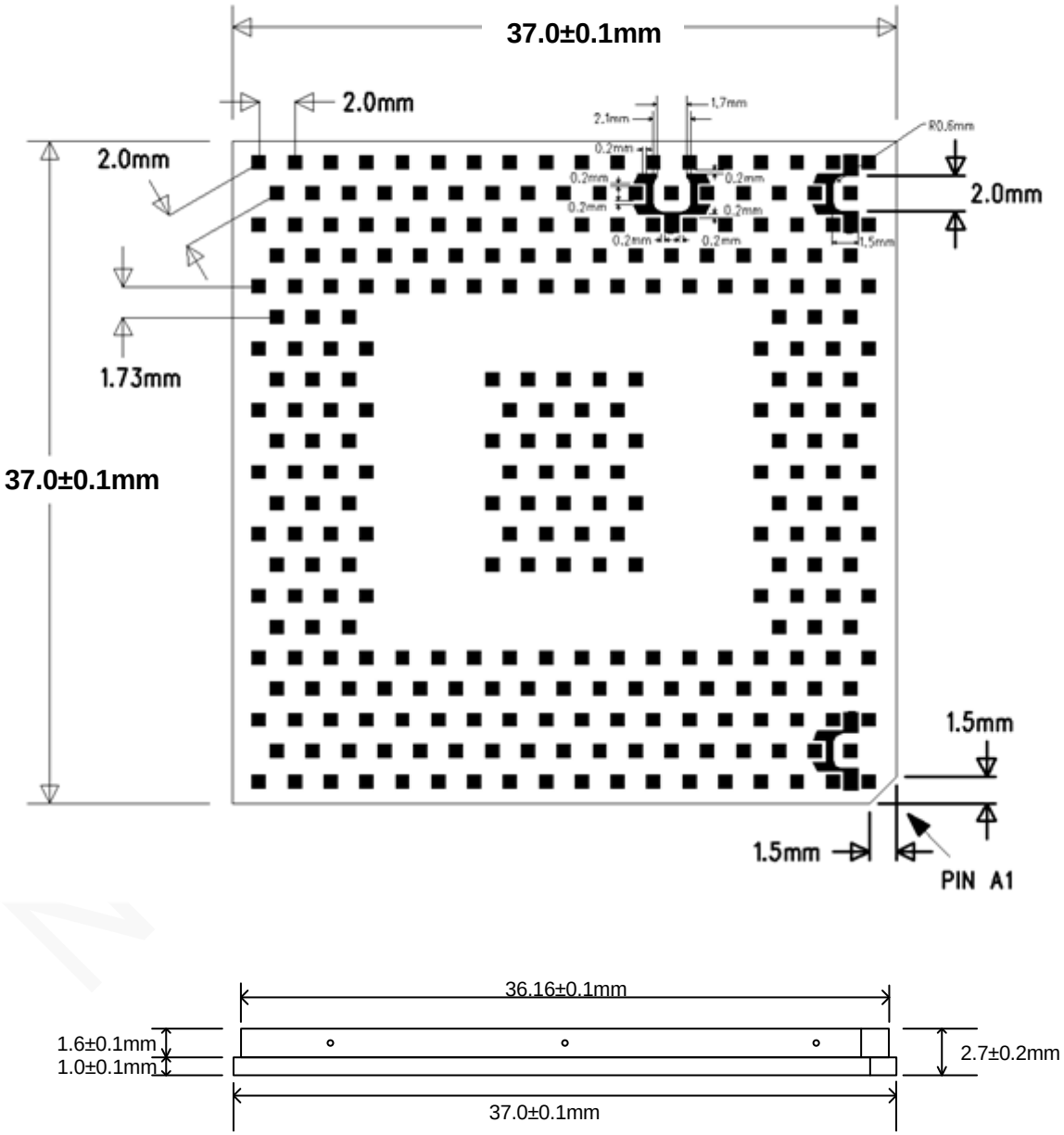
Max. positioning speed	515m/s
Max. positioning acceleration	4g
GNSS data type	NMEA-0183
GNSS antenna type	Passive/active antenna

Tracking sensitivity, acquisition sensitivity, and re-acquisition sensitivity were obtained in signaling test on SPIRENT6300 and they are the maximum values of multiple tests on samples. No external LNA or active antenna was used in the test.

6 Mechanical Features

6.1 Dimensions

Figure 6-1 A70 dimensions



6.2 Label

The label is made of materials that are deformation-resistant, fade-resistant, and high-temperature-resistant and it can endure high temperature up to 260 °C.

Figure 6-2 A70 label

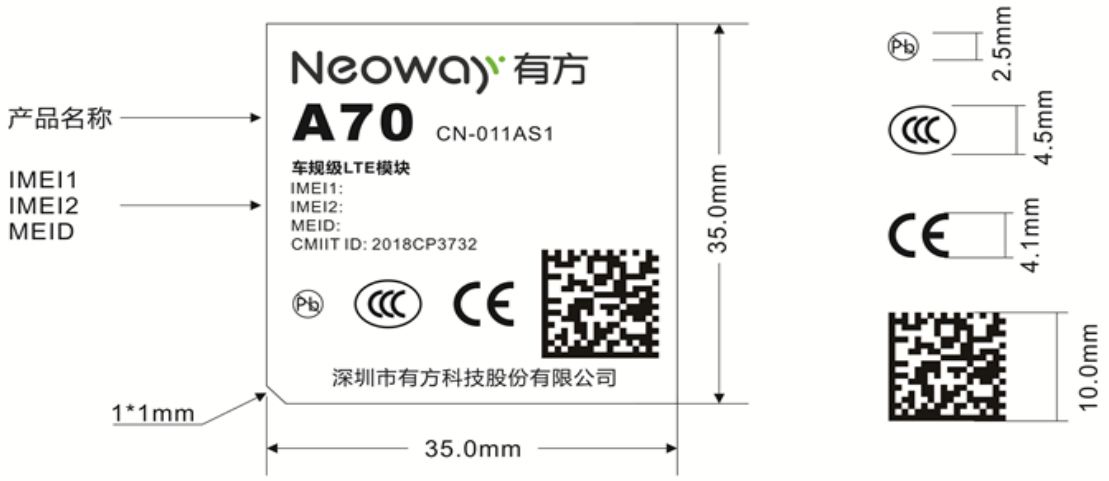


Figure 6-3 A70 lable

Figure 6-4 A70V2 label

Figure 6-5 A70V3 label

- The picture above is only for reference.
- The silk-screen printing must be clear. No blur is allowed.
- The material and surface finishing must comply with RoHS directives.

6.3 Package

A70 modules are packaged in sealed vacuum bags with dryer, humidity card, and reel on delivery to guarantee a long shelf life. Follow the same package method again in case of opened for any reasons.

6.3.1 Reel

A70 in mass production is delivered in the following packaging.

Figure 6-6 A70 reel packaging

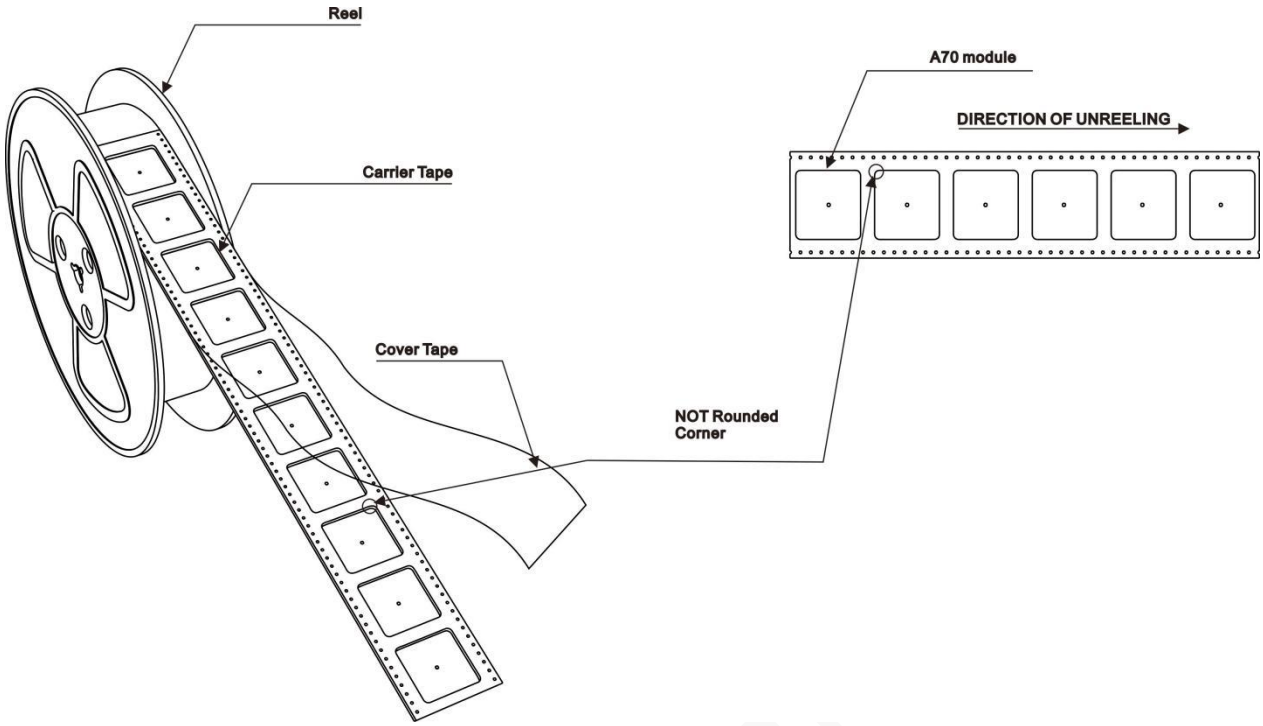
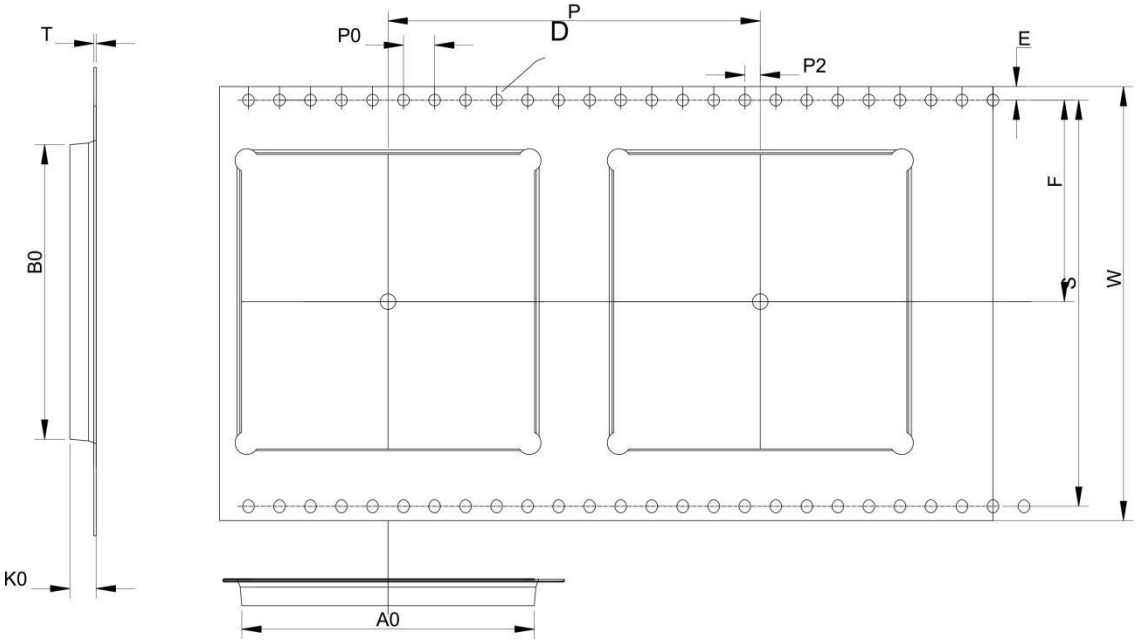


Figure 6-7 A70 reel dimensions

5	6		7	8	9		10	11	12			
ITEM	W	A0	B0	S	D	E	F	K0	P0	P2	P	T
DIM	56.0	37.4	37.7	52.4	1.5	1.75	26.2	3.55	4.0	2.0	48.0	0.30
TOLE	+0.3 −0.3	+0.1 −0.1	+0.1 −0.1	+0.1 −0.0	+0.1 −0.0	±0.1	±0.10	+0.1 −0.1	±0.1	±0.1	±0.1	±0.05



6.3.2 Moisture

A70 is a level 3 moisture-sensitive electronic elements, in compliance with IPC/JEDEC J-STD-020 standard.

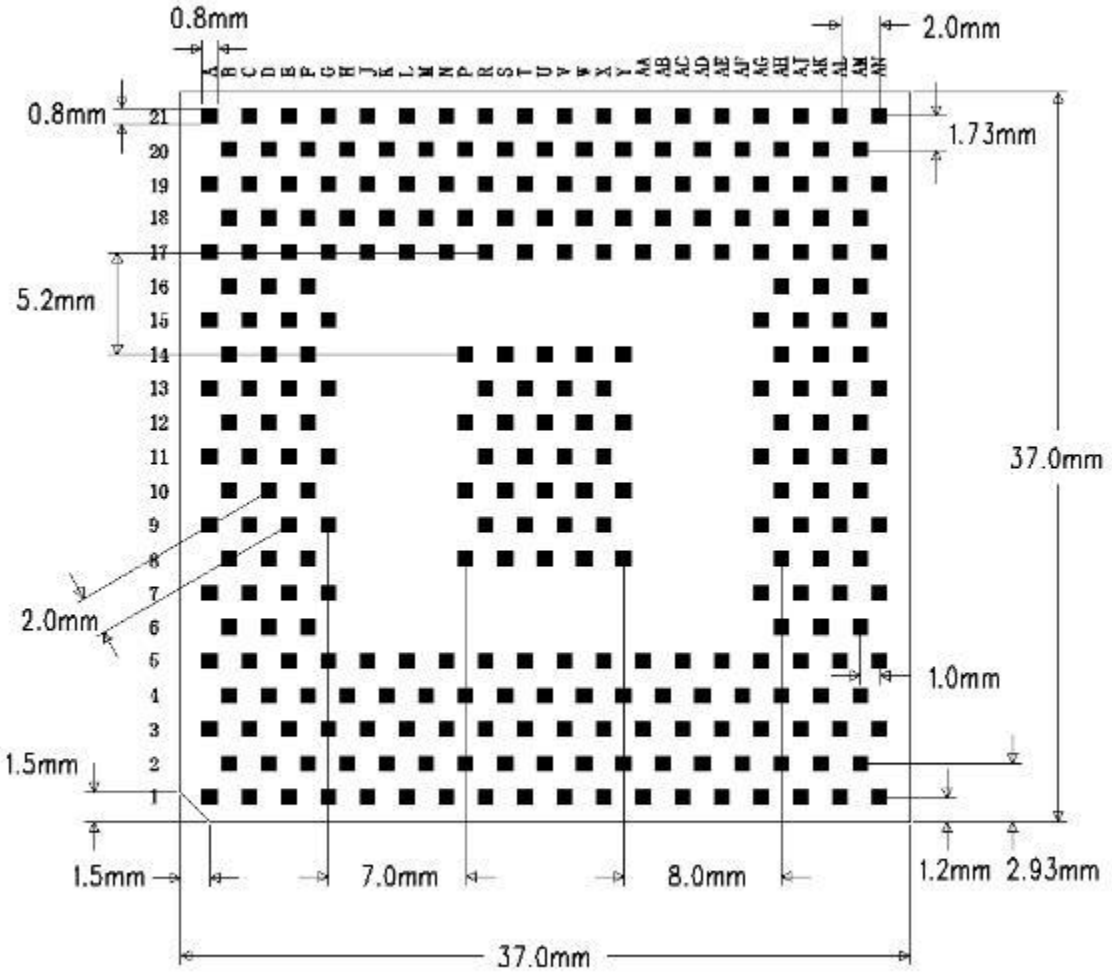
If the module is exposed to air for more than 48 hours at conditions not worse than 30°C/60% RH, bake it at a temperature higher than 90 degree for more than 12 hours before SMT.Or, if the indication card shows humidity greater than 20%, the baking procedure is also required.Do not bake modules with the package tray directly.

7 Mounting A70 onto the Application Board

A70 is introduced in 284-pin LGA package. This chapter describes A70 foot print, recommended PCB design and SMT information to guide users how to mount the module onto application PCB board.

7.1 Application Foot Print

Figure 7-1 Recommended PCB Foot Print



7.2 Stencil

The recommended stencil thickness is at least 0.12 mm to 0.15 mm.

7.3 Solder Paste

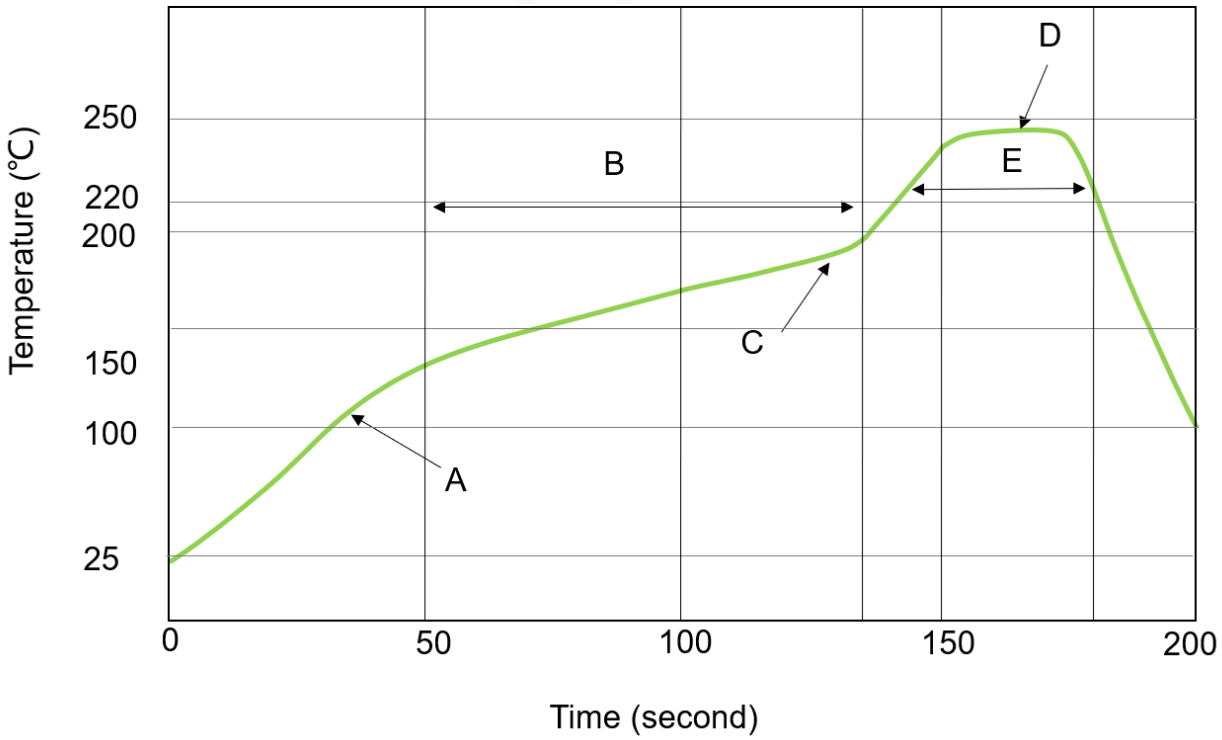
Do not use the kind of solder paste different from our module technique.

- The melting temperature of solder paste with lead is 35 °C lower than that of solder paste without lead. It is easy to cause voiding for LGA and LCC inside the module after second reflow soldering.
- When using only solder pastes with lead, please ensure that the reflow temperature is kept at 220 °C for more than 45 seconds and the peak temperature reaches 240 °C.

7.4 SMT Furnace Temperature Curve

Thin or long PCB might bend during SMT. So, use loading tools during the SMT and reflow soldering process to avoid poor solder joint caused by PCB bending.

Figure 7-2 SMT furnace temperature curve



Technical parameters:

- Ramp up rate: 1 to 4 °C/sec
- Ramp down rate: -3 to -1 °C/sec
- Soaking zone: 150-180 °C, Time: 60-100 s
- Reflow zone: >220 °C, Time: 40-90 s
- Peak temperature: 235-245 °C

Neoway will not provide warranty for heat-responsive element abnormalities caused by improper temperature control.

For information about cautions in A70 storage and mounting, refer to *Neoway Module Reflow Manufacturing Recommendations*.

When manually desoldering the module, use heat guns with great opening, adjust the temperature to 245 degrees (depending on the type of the solder paste), and heat the module till the solder paste is melt. Then remove the module using tweezers. Do not shake the module in high temperatures while removing it. Otherwise, the components inside the module might get misplaced.

8 Safety Recommendations

Ensure that this product is used in compliant with the requirements of the country and the environment. Please read the following safety recommendations to avoid body hurts or damages of product or work place:

- Do not use this product at any places with a risk of fire or explosion such as gasoline stations, oil refineries, etc
- Do not use this product in environments such as hospital or airplane where it might interfere with other electronic equipment.

Please follow the requirements below in application design:

- Do not disassemble the module without permission from Neoway. Otherwise, we are entitled to refuse to provide further warranty.
- Please design your application correctly by referring to the HW design guide document and our review feedback on your PCB design. Please connect the product to a stable power supply and lay out traces following fire safety standards.
- Please avoid touch the pins of the module directly in case of damages caused by ESD.
- Do not remove the USIM card in idle mode if the module does not support hot plugging.

A Conformity and Compliance

A.1 Approvals

- CCC
- SRRC
- CTA
- RoHS

A.2 Chinese Notice

A.2.1 CCC Class A Digital Device Notice

This product has been tested and found to comply with the limits for class A digital devices.These limits are designed to provide reasonable protection against harmful interference in a residential installation.

A.2.2 Environmental Protection Notice

This product is in compliant with China RoHS directives and does not contain any hazardous substances as per the above referenced standard. Follow the regulations of the countries when storing, applying, and discarding it.

B Abbreviation

Abbreviation	English Full Name
ADC	Analog-Digital Converter
BT	Bluetooth
CDMA	Code Division Multiple Access
CODEC	COder-DECoder
DC-DC	Direct Current-Direct Current Converter
DC-HSPA+	Dual-carrier HSPA+
DDR	Double Data Rate
DSDA	Dual SIM Dual Active
DSDS	Dual SIM Dual Standby
DSSS	Dual SIM single Standby
DSRC	Dedicated Short Range Communications
DTR	Data Terminal Ready
EGSM	Enhanced GSM
eMMC	Embedded Multi Media Card
ESD	Electronic Static Discharge
EVDO	Evolution Data Optimized
FDD	Frequency Division Duplex
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GPIO	General-Purpose Input/Output
GPS	Global Positioning System
GSM	Global Standard for Mobile Communications
HS200	High-Speed 200 MBps
HS400	High-Speed 400 MBps
HSIC	High-Speed Interchip
HSPA+	High-Speed Packet Access
HSUPA	High-Speed Up-link Packet Access

I2C	Interintegrated Circuit
I2S	Inter-IC Sound
IEEE	Institute of Electrical and Electronics Engineers
LDO	Low Dropout Regulator
LGA	Land Grid Array
LNA	Low Noise Amplifier
LTE	Long-Term Evolution
MAC	Media Access Control
Mbps	Million bits per second
MBps	Million Byte per second
MCU	Micro Controller Unit
MDIO	Management Data Input/Output
OTG	On-The-GO
PCB	Printed Circuit Board
PCM	Pulse-Coded Modulation
PHY	Physical Layer
PPAP	Production Part Approval Process
RF	Radio Frequency
SD	Secure Digital
SDC	Secure Digital Card
SDR	Single Data Rate
SGMII	Serial Gigabit Media Independent Interface
SPI	Serial Peripheral Interface
TBD	To Be Determined
TDD	Time Division Duplex
TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
TVS	Transient Voltage Suppressor
UART	Universal Asynchronous Receiver-Transmitter
USIM	Universal Subscriber Identity Module
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
V2P	Vehicle to Pedestrian

V2V	Vehicle to Vehicle
WCDMA	Wide-band Code Division Multiple Access
WCI	Wireless Coexistence Interface
WLAN	Wireless Local Area Network