

# Dnet

Microwave Radar Sensor



<http://www.dno.co.kr>  
<http://www.dnetgroup.kr>

# Dnet History

Microwave Radar Sensor

Strive to Develop, produce and sell  
the products corresponding to customers

1987

Established Dongnam & Tech (individual enterprise): Designed and produced industrial robots.

2002

Developed a microwave sensor module independently for the first time in Korea, selected as a company for a special case on military service.  
Developed and sold microwave security detectors and lighting sensors for the first time in Korea

2006

Registered as a venture enterprise (company excellent in technology assessment).

2009

Built an affiliated research institute and the second factory (Dalseong 2nd industrial complex).  
Developed and applied for a patent on a microwave micromodule.

2000

Established Dongnam & Tech corporation (developed and produced LNB).

2003

Applied and registered a patent and utility model on the microwave sensor, obtained CE (ETSI EN 300440), FCC (Part 15) and ROHS certificate.

2007

Changed the company name to Dnet Co., Ltd.

2011

Decided and registered a patent (subminiature antenna that combines a strip line and slot-type feeding).  
Developed an outdoor security detector (K-Band).

2013~2014

Registered as a material parts specialized company.  
Completed the development and mass-production of a military radar sensor (DND-30/60/90).

2015

Aug 2015  
DND30/60.90 IP66 and KCC (broadcasting communication equipment certification) in progress  
Nov 2015  
DND-30/60/90 patent application in progress

2016

Feb 2016  
Applied for a patent (10-2016-0012897). Safety device informing user of means of transportation approaching from the rear (radar sensor).  
Mar 2016  
Suitability certification on an wireless device for object detecting sensors (24GHz frequency): MSIP-CRM-DNR-DND-306090

May 2016  
Radar security detector (DND-Series: DND-30/DND-60/DND-90): IP65 certification  
Radar security detector (DND-Series Premium: DND-30/DND-60/DND-90): IP66 certification  
Radar security detector (DND-Series Premium: DND-30/DND-60/DND-90): Low temperature/ high temperature test, salt water test and temperature/humidity test certification

Sep 2016  
Registered a patent (10-1656251): Intrusion detection system (radar security detector grafting detection area dividing technology)  
Nov 2016  
Selected as a material parts specialized company (Ministry of Commerce, Industry and Energy). Received the new technology prize at 17th radio broadcasting: Prize from the Minister of Science, ICT and Future Planning).

2017

Mar 2017  
Developed subminiature K-Band Radar Module (DNS-324/DNS-334).  
Nov 2017  
Completed applying for a patent (in-vehicle remaining passenger detecting and warning device).  
Completed applying for a patent (getting-off passenger protecting device by detecting approaching objects).  
Dec 2017  
Selected as an export promising SME.

2018~

Mar 2018  
DNS-060 KC conformity certification  
May 2018  
Acknowledged for the research exclusive department.  
Sep 2019  
Selected as a Pre-Star company.  
Dec 2018  
DND-3106 KC conformity certification

2019~

Feb 2019  
DNC-300(S) KC conformity certification  
May 2019  
Registered as a small and medium-sized venture enterprise.  
Jun 2019  
Obtained the performance certification (Ministry of SMEs and Startups), DND-30/60/90  
Jun 2019  
DNC-150T, DNC035S KC conformity certification  
Jul 2019  
Completed registering the U.S. patent (in-vehicle remaining passenger detecting and warning device).

Company leading the development and manufacturing of radar sensors

Dnet is a small and medium-sized enterprise specializing in producing microwave sensors (lighting sensors, security detectors, automatic door sensors, vehicle sensors, etc.). Dnet is a venture enterprise and export promising SME that recognizes the importance of the development of cutting-edge products using new technology and intensively invests in research and development to develop new products in the rapidly changing business environment.

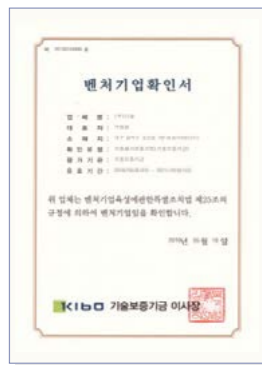
As a result of exerting efforts to develop info-communications/electrical and electronics/radar sensor equipment based on this, Dnet Co., Ltd. is manufacturing products in full-scale and selling them abroad after completing developing microwave motion sensors (module/detector/activator) and establishing a production line for a mass-production system.

Products made by Dnet Co., Ltd. are recognized for their excellence so the entire output is exported and the affiliated research institute actively developing new products.

Dnet Co., Ltd will strive to develop, produce and sell products satisfying the demands and expectations of consumers by developing new products and based on years of accumulated practical experience and human resources. All of our executives and employees have a mindset of challenging and creating for Dnet to become an info-communication equipment manufacturing company leading microwave in the 21st century.

Dnet Co., Ltd.

## CUSTOMER SATISFACTION AND QUALITY-FIRST POLICY



Venture enterprise confirmation



Pre-Star company designation certificate



Export promising SME designation certificate



Material parts specialized company confirmation



Patent No. 10-1870916



Broadcasting communications equipment (radio wave suitability) conformity certificate



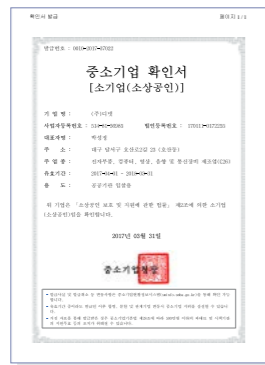
Broadcasting communications equipment (wireless) conformity certificate



Broadcasting communications equipment conformity certificate



Written recognition of R&D exclusive department



SME confirmation



Patent No. 10-1656251



Patent No. 10-1056860



KC conformity certificate (DND-3000)



Broadcasting communications equipment certificate (DNS-400)



Test report (DND-3000)



Test report (DND-200)



Performance certificate



KC conformity certificate (DND-2000)



KC conformity certificate (DNC-300, DNC-300S)



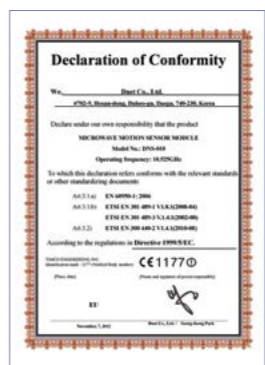
KC conformity certificate (DNC-150T, DNC-035S)



Test report (radar sensor)



Test report (DND-5000)



Declaration of conformity (DNS-010)



Grant of equipment authorization



KC conformity certificate (DND-3106)



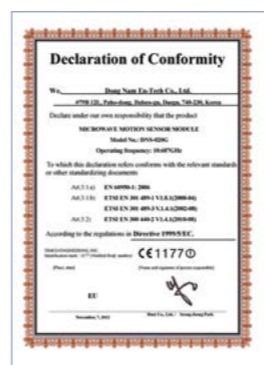
KC conformity certificate (DNS-060)



KC conformity certificate (DND-Q1000)



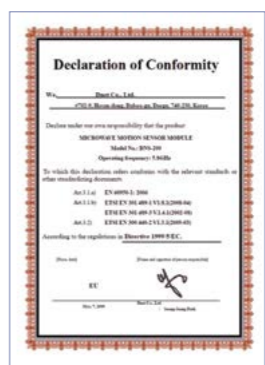
KC conformity certificate (DND-30/60/90)



Declaration of conformity (DNS-020G)



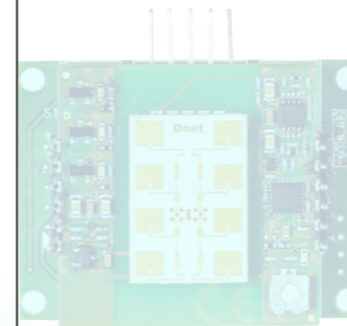
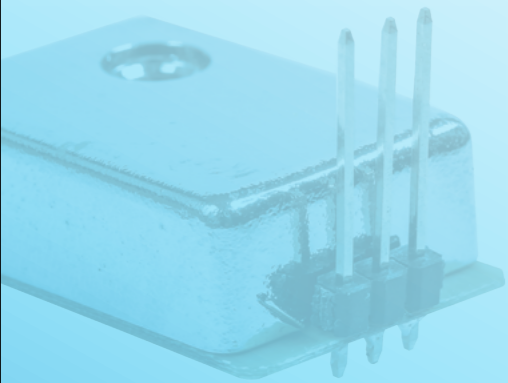
Declaration of conformity (DNS-040)



Declaration of conformity (DNS-200)



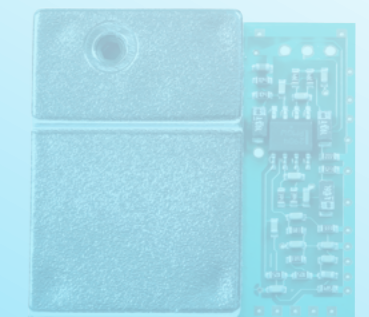
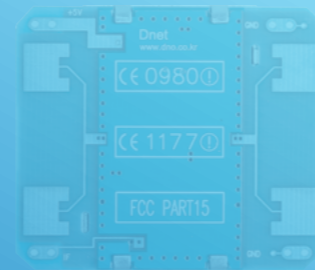
U.S. patent No. 16-040, 349



# Product Introduction

Radar Sensor Module	(K-Band)
Radar Sensor Module	(C-Band)
Radar Sensor Module	(X-Band)
Radar Lighting Sensor	
Radar Sensor Module	(S-Band)

## Microwave Radar Sensor





## DND-Family (DND-30L/W, 60L/W, 90L/W)



### Feature

- It controls with intelligent digital technology using a radar sensor module.
- It can divide into 12 zones (2, 5, 5, 7.5m\*12) and can control and lift a desired zone (e.g. It can lift or put an alert on the entrance only).
- It is stable since the signal is standardized regardless of the range and there are almost no errors.
- It can be controlled remotely with RS-485 or Ethernet communication.
- Anti-masking function · KC conformity certification
- Pet immunity function and natural environment immunity (snow, rain, fog, storm, etc.) function
- High-tension voltage failure clearance function
- Suitable for security alert of various geographical features (screen barriers, valleys, flatlands, etc.)

### Specification

Specification	Type	Specification	Type
Voltage	15V ~ 30Vdc	Alarm Outputs	Relay(Normally closed)
Current consumption	80mA ~100mA	Dimensions (H*W*D)	197mmX125mmX55mm (Bracket except)
Speed	0.3~8M/sec	Weight	0.6kg
Frequency	24.125GHz	Operating Temp	-40°C ~ +85°C
Detection Distance	Sense area table reference	Mounting Style	Wall,fence.etc
Detection Height	Sense area table reference	Mounting Height	1M
Detection Width	Sense area table reference	Interface	RS-485

### 3D Image

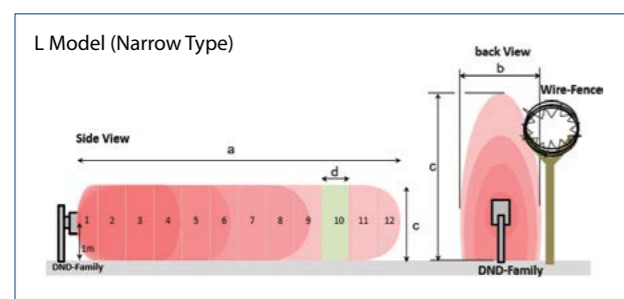


### Setting Program



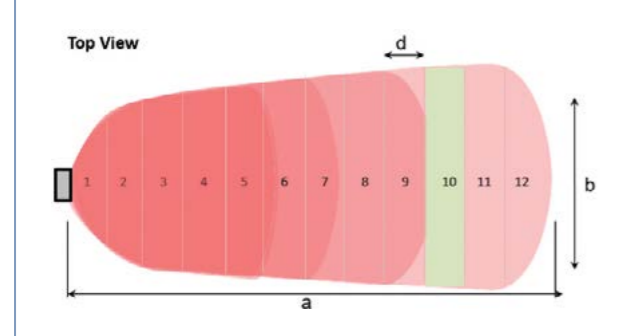
The detection range (width/detection/angle) may vary according to the installation environment.

### Detection Range



Model	30L	60L	90L	120L
b	1~4m	3~5m	3~5m	3~5m

### W Model (Wide Type)



Model No.	a	b	c	d	Angle	Remark
DND 30L	30m	1~4m	3~5m	2.5m	***	Narrow
DND 30W	30m	25m	4m	2.5m	12°x80°	Wide
DND 60L	60m	3~5m	5m	5m	***	Narrow
DND 60W	60m	25m	4m	5m	7°x25°	Wide
DND 90L	90m	3~5m	5m	7.5m	***	Narrow
DND 90W	90m	25m	4m	7.5m	7°x25°	Wide
DND 120L	120m	3~5m	5m	10m	***	Narrow
DND 120W	120m	25m	4m	10m	7°x25°	Wide

## DND-200D / 200A Microwave Barrier Rader Detector



### Feature

- Detection range: Max. 200m (based on ground level)/80~100m (based on fence)
- Operating temperature: -40°C ~ +65°C
- Input power: ~30 Vdc.
- Detecting an intruder walking, running or leaving
- Installed quickly and easily on pillars, fences and walls.
- No need for maintenance.
- High RFI/EMI immunity
- Can be controlled remotely with RS-485 communications
- Installation height: Install at a height of 80~90cm from the ground (when installing on a fence, install at a height of 20~30cm but within 2.5~3m from the ground).
- KC conformity certification

### Specification

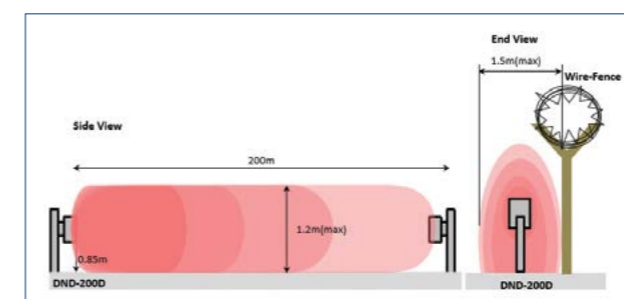
Microwave Frequency	Weather Proofing
Scope (Length of Protection zone)	Max. 200m
Lobe Width	1.5m(Max)
Lobe Height	1.2m(Max)
Range of Power Supply Voltage	9 ~ 30 Vdc
Current Consumption	35mA
Relay Contacts Values	N.C 28 Vdc, Maximum current 0.1 A
Alarm Period	3 Sec (Max.)
Tamper Switch	N.C 28 Vdc Maximum current 0.1 A - open when cover is removed
Detection Speed (Target Velocity)	0.1 ~ 10 m/sec
Remote testing	Built-in self-test generator simulates actual intrusion signals
Flatness of Ground	Approx. 0.3 m
Maximum Height of Grass on the ground	0.3 m
Maximum Height of Snow on the ground	0.5 m
Alarm Output - Switching over of relay Contacts for the time	Minimum 3 Sec
Dimensions of Unit (trans./rec.) W/O bracket	211x138x105mm
Weight (T,Rand Accessories)	1.2Kg
Operating Temperature Range	-40°C ~ +65°C
Interface	RS-485
Weather Proofing	· All openings with gasket and sealed · Conformal coated circuit board

### Note

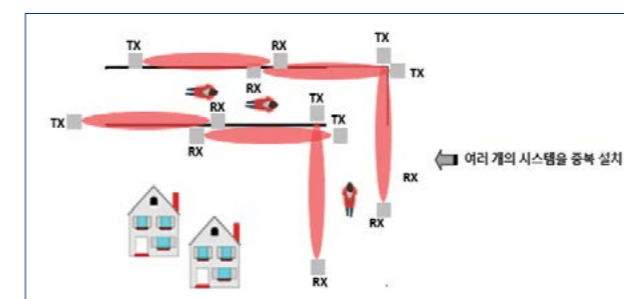
- The detection range, detection width and detection height may vary depending on the installation place and installation environment.
- This sensor is a sensor for fences so the detection width and alarm output vary due to its characteristics.
- Therefore, the detection width is 1~1.5m but the alarm may not sound within this range. The alarm sounds when passing through the center of the receiving part and the sending part of the sensor (in other words, when entering about 50% of the detection width).



### Detection Range



- The detection range, detection width and detection height may vary depending on the installation place and installation environment.
- It must be installed at a height of 80~90cm from the ground.



### 3D Image



### Setting Program





## DND-50B, 100B IR & Radar Security Detector



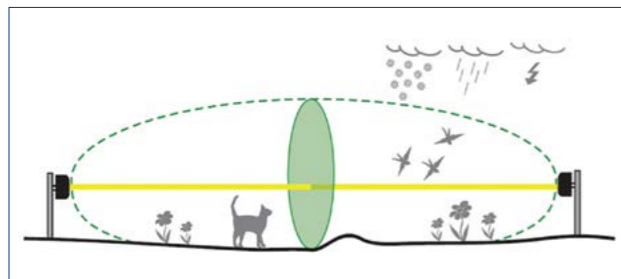
### Feature

- Dual sensor with almost no errors
- Used for the security of a wide area.
- Installed on small and large factories, military bases, highway safety and ports.
- Has high disturbance immunity to nature, artificial elements and general obstacles.
- Has high disturbance immunity by using dual detection of microwave (radar) and infrared rays (IR) type.

### Specification

Specification	Type	Specification	Type
Voltage	15V ~ 30Vdc	Alarm Outputs	Relay (Normally closed)
Current Consumption	0.05A	Dimensions (H*W*D)	211mm X138mm X105mm
Housing protection level	IP-55	Weight	3kg
Frequency	24.125GHz	Operating Temp	-40°C ~ +65°C
Detection Range	50m (DND-50B)	Mounting Style	Wall, fence, etc
	100m (DND-100B)		
Detection Width	0.2m	Interface	RS-485, USB and Bluetooth (upon request)

### Detection Range



## DND-300 / 300M Indoor, 10.525Ghz

## DND-Q1000 Indoor/Outdoor 24.125GHz



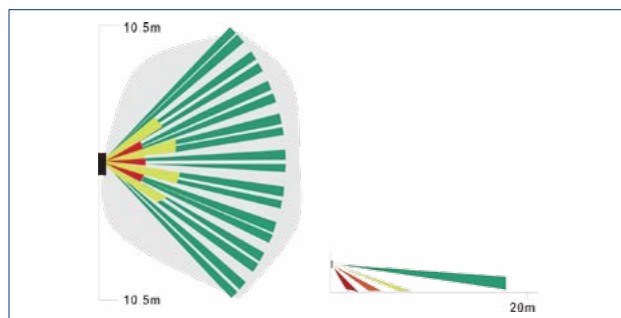
### Feature

- Microwave detection based on the Doppler principle
- Using a microwave motion sensor module with a micro-strip patch antenna
- Installation considering a user's convenience (using a wall and ceiling bracket)
- Microwave sensitivity adjustment and PIR sensitivity adjustment
- Two-way temperature compensation
- LED on/off jumper
- Environmental immunity
- Does not detect pets weighing less than 25kg (DND-300M)

### Specification

- Detection Method : Quad element PIR & microwave pulse Doppler
- Power Input : 8.2 to 16Vdc
- Current Draw Active : 25.5mA
- Standby : 16.5mA
- Temperature Compensation YES
- Alarm Period 2 +/- 1 sec
- Alarm Output : N.O 28 Vdc 0.1 A with 10 Ohm series protection resistors
- Tamper Switch : N.C 28 Vdc 0.1A with 10 Ohm series protection resistor - open when cover is removed
- Warm Up Period : 1 min
- LED Indicator : Yellow LED is blinking during warm up period and self testing Red LED: ON during alarm Green LED: Pir Channel Yellow LED: MW channel
- Dimensions 115mm x 61mm x 37.5mm
- Weight : 120g
- Option : Wall & Ceiling Mount Bracket

### Detection Range



## DND-3000 Double Quad PIR & Microwave Outdoor Detector



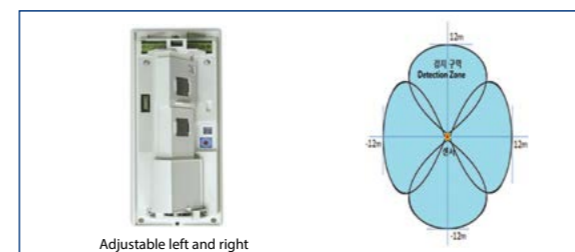
### Feature

- Applying Microwave K-Band using the Doppler principle
- The detection range (angle) is 90°. It can be adjusted within 180°.
- Powerful polycarbonate housing and automatic temperature compensation
- A user can select sensitivity adjustment
- Excellent RFI immunity
- Excellent sunlight and white light filtering
- KC conformity certification

### Specification

Specification	Type	Specification	Type
Voltage	9.6~ 16Vdc	Detection Distance	12M
Current (MAX)	24mA (+/- 5%)	Tamper Switch	Two Switches
Current (Stand by)	21mA (+/- 5%)	Operating Temp	-35°C ~ +55°C
Microwave Power	13dBm EIRP	Led Indicator	Led is ON during ALARM
Frequency	24.000 ~ 24.250GHz	RF immunity	10V/m plus 80% AM from 80MHz to 2GHz
Communication Mode	Ethernet	Mounting Style	Pole
Warm up Period	120 sec(+/- 5sec)	Mounting Height	0.8M ~1.5M
Alarm Period	2 sec(+/- 0.5sec)	Weight	2Kg
Alarm Output	Form C (NC,NO, COMMON)	Dimensions (H*L*W)	200 x 86 x 80 mm

### Detection Range



- DND-3000 detects the distance up to 15m by combining PIR and microwave detection patterns (when installing on the height of 1.0~1.2m from the ground).
- DND-3000 can control the housing (including two PIR and microwave devices) moving inside to the right and left and is used by adjusting the detection angle to the application range of 90° from 0° to 180°.

### Reference

- DND-3000 is an outdoor security detector applying infrared rays and a radar (microwave) sensor. It is perfect for application in a poor outside environment.
- DND-3000 is designed for outdoor use so it can be used in a very poor environment and does not detect pets.
- With the combination of dual technology hardware and precise software technology, it can provide high reliability and cover various spaces. There are also almost no errors.
- Its inside is composed of dual PIR and a radar (microwave) sensor. It has an elegant, strong plastic body.
- This sensor surely removes false alarms based on high reliability while detecting intruders in a protection zone along with a microwave Doppler sensor.
- The detection sensitivity and angle can be adjusted to 16 measurement levels using a digital rotary switch so an effective pattern is set every time according to the protection zone and environment.
- DND-3000 is designed to protect a wide area. It can be easily installed on the wall for firm protection. It has a 'PET MASK' function so it removes the disturbances by birds or small animals effectively.

## Alpha-30 Alpha / Alpha W



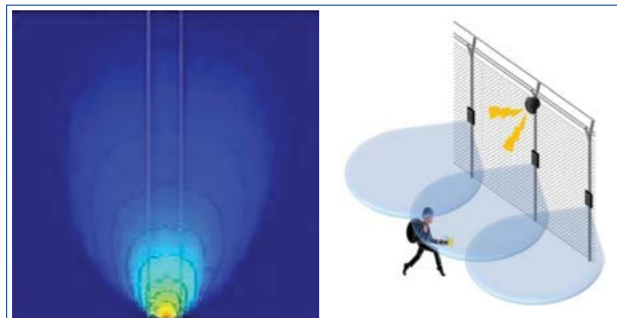
### Feature

- Smart radar security detector
- Applying microwave K-Band (24,125GHz) dual signal
- Detection angle: 80°~90° or 130°~140°
- Frequency collision preventive function - Small animal, rain, snow, lightening and white light avoiding function (recognizing patterns)
- ID assigning function through RS-485 communication function
- Sensitivity adjustment selection and time adjustment function
- PC8 Ass'y without housing (option: powerful ABS housing function)
- Radar sensor for streetlights/security lights control
- Can be used outdoors and indoors.

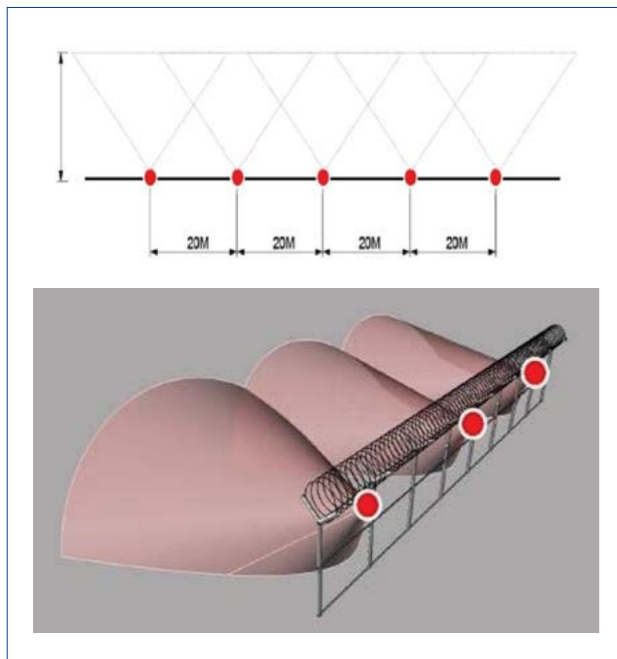
### Specification

- Detection Method : Radar(Microwave) Doppler
- Microwave Frequency : 24.125GHz
- Detection Range : Alpha Max. 25m
- Detection Range : \* Alpha: 80°(H) \*12°(V)  
\* Alpha W : 130°(H) \* 12°(V)
- Input Power : 12.0 ~ 30.0Vdc
- Alarm Output : Serial Data(RS-485) N.C or N.O(Relay Signal)
- Alarm Period : 2 +/- 1sec
- Detection time : 50m sec typical
- Operating Temp. : - 40° ~ + 60°
- LED Indicator : Blue LED - ON during alarm
- Weight : 200g
- Option : Housing

### Detection Area (Antenna Radiation Pattern)



### Detection Area (Installation Method)



## DNL-400(LED) Lighting sensor

### Feature

- Radar Motion Lighting Sensor
- Used a RF the Microwave Motion Sensor Modules.
- Applying the Doppler radar principle.
- Input Voltage : DC Only(12VDC ~ 24VDC).
- Low cost & Low Power Consumption.
- Connection : Jack Type
- Ceiling Type



## DNL-400(MR) Lighting sensor

### Feature

- Microwave Motion Sensor Light Modules
- Used a RF the Microwave Motion Sensor Light Modules.
- Applying the Doppler radar principle.
- Input Voltage : AC Only(220V ~ 240V)
- Low cost & Low Power Consumption.
- Ceiling Type



## DNL-400(XH)/DNL-400(CH)

### Feature

- Microwave Motion Lighting Sensor -
- Used a RF the Microwave Motion Lighting Sensor
- Connection of Module and Controller.
- Applying the Doppler radar principle.
- Low cost and Low Power Consumption.
- Small size and 220VAC(Input Power)

### Model NO.

Model NO.	Model Name	Remark
DNL-400XH	X-Band Microwave Lighting Sensor	10GHz
DNL-400CH	C-Band Microwave Lighting Sensor	5GHz
DNL-400SH	S-Band Microwave Lighting Sensor	2GHz



## DNL-400(L) Radar Lighting Sensor

### Feature

- Used a RF the Microwave Motion Sensor Modules.
- Applying the Doppler radar principle.
- Input Voltage : DC Only(12VDC ~ 24VDC)
- Low cost & Low Power Consumption.
- Connection : Jack Type
- Ceiling & Wall Type



## DNC-Series DNC-300(1)/300(3)/300(S)



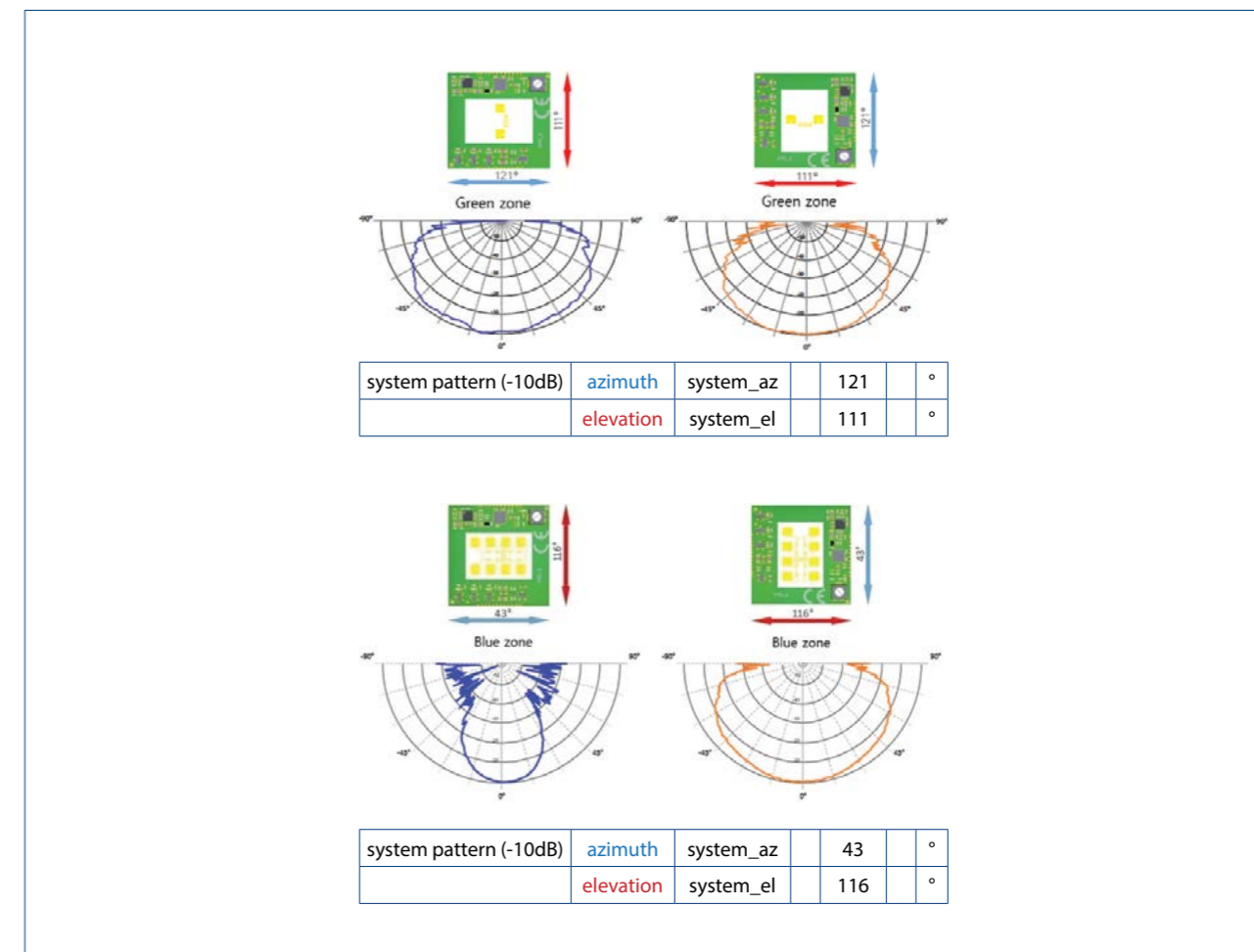
### Feature

- K-Band Radar Sensor
- Micro radar sensor applying small, thin, slim design
- Detection distance: Max 5m~12m
- Detection-range adjusting function
- Close switch function detecting objects at a distance of 10cm or less
- Speed (1~30km/h) identifying function (1.5~5m)
- Motion detection
- Direction (forward/backward) identifying function (1.5~5m)
- Open collector output and UART interface function
- Eco mode with less power consumption (reducing by 90% max)
- Detecting stopped objects: Detecting the existence of fixed objects
- Detecting targets: Detecting five target objects

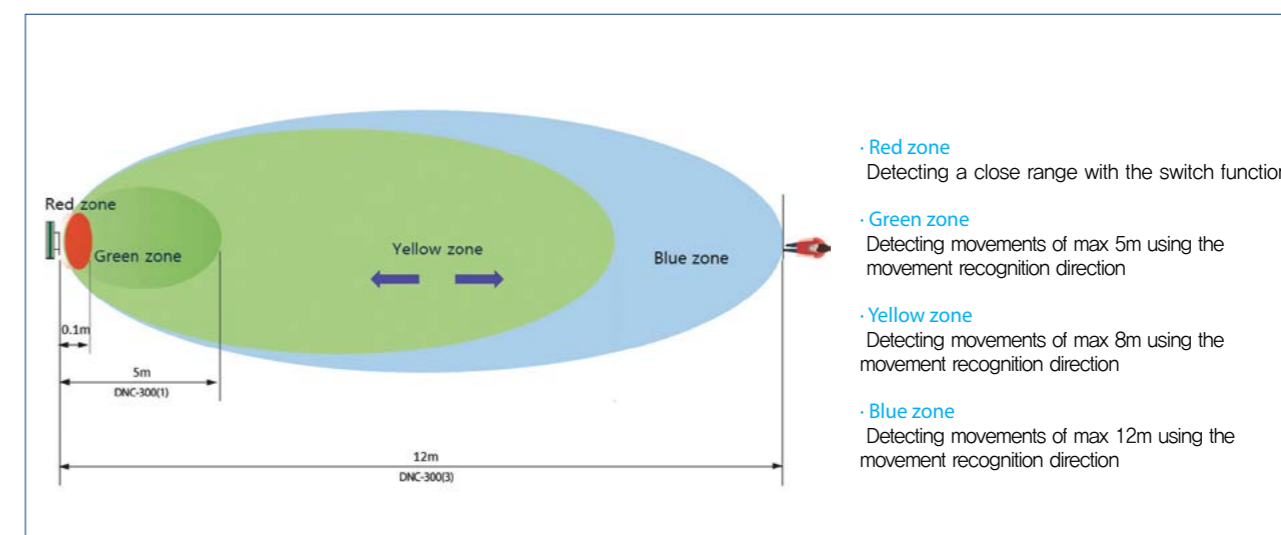
### Specification

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>Radar</b>					
transmit frequency		24.050		24.250	GHz
output power (EIRP)				20	dBm
<b>Sensor</b>					
max adjustable detection range	motion detection for an RCS = 1m <sup>2</sup>			12	m
	switch functionality E.g. Detection of a hand			0.1	m
range for direction of movement recognition	E.g. Detection of a person	1.5		12	m
activation time switch			400		ms
velocity range		0.7		34	km/h
antenna pattern (10dB width)	compare plot on page 13				°
					°
<b>Power supply</b>					
supply voltage		12		15	v
supply current	full operation	55	60	65	mA
<b>Environment</b>					
operating temperature		-20		+60	°C
storage temperature		-40		+85	°C
<b>Mechanical Outlines</b>					
outline dimensions	height length width		16.0 34.0 45.5		
<b>Weight</b>					
			13.2		g

### Antenna Pattern



### Detection Zone





## Function Description

**Potentiometer (variable resistance)**  
 Minimum distance: Approximate detection range  
 Movement sensor 1.5~2m  
 Maximum distance: Minimum detection range  
 Moving sensor 5~12m

**Status LED**  
 LED informs power on (lasting) and saving mode (flickering).

**Detection LED**  
 If 'forward' and 'backward' LEDs are on at the same time, it means an object is moving at less than 2m distance from the sensor.

· The sensor can switch Pin #10 to the power consumption ECO mode with continuous operation through pull-down and Pin #1 to the stand-by mode through pull-down. In the ECO mode, the sensor works once per second and sound a dial tone while LED is flickering. For detection, the sensor maintains the activation status for 5 seconds.

· The close switch is activated by detecting within the less than 10cm distance. The next parameter can be revised through UART interface (the default value in bracket).

- Time to active the output after sensing a motion (0,5sec)
- Output activating time after detecting a motion (1sec)
- The motion sensing output can be de-activated individually.
- Time to activate the close switch after detecting an object (0,3sec)
- Minimum time between activation of two close switches (0,6sec)

## Interface & Outline

Connector	Description	In/Out	Comment
1	GND	IN	
2	VCC	IN	12~15V
3	Relay	OUT	Relay COM
4	Relay	OUT	Relay NO or NC
5	VCC	OUT	5.0V (TTL_low 0V high 5.0V)
6	GND	OUT	5.0V (TTL_low 0V high 5.0V)

# DNC-150T



## Feature

- Motion-measuring system based radar working in the 24GHz ISM band
- Measuring the distance of a moving object
- Measuring the distance from accuracy 0.3m to 150m
- Configurable detection range
- Speed detection: 0.8km/h ~ 250km/h
- Strong metal housing designed for outdoor use



## Technology

- K-Band distance measuring system with an intelligent  $\mu$  C deciding device
- This system is based on the latest MMIC technology so it provides the best measurement stability for temperature and aging.
- The system can detect stopped objects at a distance from 1.1m (3.6ft) to 35m (115ft) according to an available bandwidth (varying depending on RCS of an object).

## Parameter

- DNC-150T is composed of 24GHz Radarfrontend (RFE) equipped with a DSP board that can measure the distance and radial velocity of an object.
- The sensor provides three outputs that can be composed within the designated range.
- Communications are performed with RS232 interface for the PWM output signal or digital output (open drain). The sensor can be configured with GUI.

## Specification

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Radar</b>						
transmit frequency		f	24.000		24.250	GHz
output power (EIRP)		Pout			20	dBm
<b>Sensor</b>						
detection distance		dr			150	m
speed range		vr	0.8		250	Km/h
standard detection field		horizontal		34		°
		vertical		49		°
<b>Power supply</b>						
supply voltage		VCC	10		30	V
supply current	@ 12V without digital out current	IC-C_12V		135	150	mA
supply current	@ 24V without digital out current	IC-C_24V		76	85	mA
<b>Digital Output Current</b>						
OUT1	open drain	IOut			-400	mA
OUT2	open drain	IOut			-400	mA
OUT3	open drain	IOut			-400	mA
digital total current		IOut			-800	mA
<b>Environment</b>						
operating temperature		TOP	-25		+60	°C
storage temperature		TSTG	-25		+60	°C
<b>Mechanical Outlines</b>						
outline dimensions		height		45		mm
		length		63		
		width		60		



## DNC-035S



### Feature

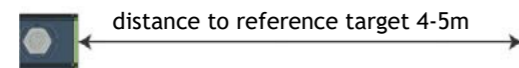
- K-Band Microwave Sensor Module
- Distance measuring system based on radar working in the 24GHz ISM band
- Measuring the distance of a fixed object
- Measurement distance from 1.1m to 35m with accuracy (the distance can be provided following request if requested.)
- Detection-range configuring function
- Strong metal housing designed for outdoor use

### Specification

PARAMETER	CONDI-TIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Radar</b>						
transmit frequency		f	24.000		24.250	GHz
occupied bandwidth	EU-version	*EU			250	MHz
	US/UK/France-version	*US			100	MHz
output power (EIRP)	@ 25°C	*out			20	dBm
<b>Sensor</b>						
detection distance	EU-version	*r_EU	1.1		35	m
	US/UK/F-version	*r_US	2.7		35	m
accuracy @ 250MHz band-width		*EU		±3		cm
accuracy @ 100MHz band-width		*US		±7.5		cm
update rate				75		ms
resolution	@ 250MHz	*EU			60	cm
	@ 100MHz	*US			150	cm
standard de-tection field		horizontal		34		°
		vertical		49		°
<b>Power supply</b>						
supply voltage		*CC	10		30	V
supply current	@ 12V without digital out current	*CC_12V		135	150	mA
supply current	@ 24V without digital out current	*CC_24V		76	85	mA
<b>Digital Output Current</b>						
OUT1	open drain	*Out			-400	mA
OUT2	open drain	*Out			-400	mA
OUT3	open drain	*Out			-400	mA
digital total current		*Out			-800	mA
<b>Environment</b>						
operating temperature		*OP	-25		+60	°C
storage tem-perature		*STG	-25		+60	°C
<b>Mechanical Outlines</b>						
outline dimen-sions		height / length / width		45/63/60		mm

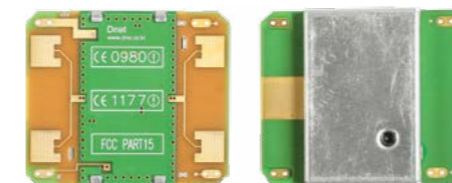
### TEST CONDITIONS FOR DISTANCE MEASUREMENT

DNC-035S



reference target metal plate 0.84m x 0.65m

The following test conditions apply to verify the accuracy of the DNC-035S.



DNS-010



DNS-010CX



DNS-040

## X-Band Series DNS-010,010CX,020,030,040



### Feature

- X-Band Radar Sensor Module(Standard Type)
- Used a RF the Microwave Sensor.
- The up-to-date sense which uses Doppler principle.
- Low cost & Low Power Consumption.
- Small and Flat Profile & pin type.
- Reliable Construction & High Sensitivity.

### Receiver

- Sensitivity (10dB S/N ratio) in 3Hz to 80Hz bandwidth:-85dBm
- Noise in 3Hz to 80Hz bandwidth:10μV
- Antenna Gain:8dBi
- E Plane 3dB Beam width:40'
- H Plane 3dB Beam width:80' (Module Characteristics)
- Power/Temp. Coefficient(over operating temp. range) :3dB
- Frequency/Temp. Coefficient(over operating temp. range) : 6.5MHz
- Operating Temperature Range : -20°C to +55°C
- Storage Temperature Range : -30°C to +70°C
- Detection Range : 15M ~ 20M(Max.)
- Weight : 6 grams. Size(mm,+/-0.2) : 40.0 \* 47.0 \* 8.3
- CE" approval mark (CE ETSI EN 300 440: RF part) and "FCC" approval mark (PARTS 15.245) and "ROHS" approval mark

### Transmitter

- Frequency : 10.525GHz.
- Frequency Setting Accuracy:3MHz
- Power Output (Min.):10dBm EIRP
- Operating Voltage:+5V +/- 0.3V
- Operating Current (CW): 30mA~35mA
- typical Harmonic Emissions: -30dBm

Model No.	Frequency	Remark
DNS-010	10.525GHz	FCC, CE
DNS-010V	10.525GHz	FCC, CE
DNS-010CX	10.525GHz	FCC, CE
DNS-020	10.687GHz	FCC, CE
DNS-030	10.587GHz	FCC, CE
DNS-040	9.900GHz	FCC, CE

## DNS-010V



### Feature

- X-Band Radar Sensor Module(Standard Type)
- Used a RF the Microwave Sensor.
- The up-to-date sense which uses Doppler principle.
- Low cost & Low Power Consumption.
- Small and Flat Profile & pin type.
- Reliable Construction & High Sensitivity.

### Transmitter

- Frequency : 10.525GHz.
- Frequency Setting Accuracy:3MHz
- Power Output (Min.):10dBm EIRP
- Operating Voltage:+3V +/- 0.3V
- Operating Current (CW): 30mA~35mA
- typical Harmonic Emissions: -30dBm

### Receiver

- Sensitivity (10dB S/N ratio) in 3Hz to 80Hz bandwidth:-85dBm
- Noise in 3Hz to 80Hz bandwidth:10μV
- Antenna Gain:8dBi
- E Plane 3dB Beam width:40'
- H Plane 3dB Beam width:80' (Module Characteristics)
- Power/Temp. Coefficient(over operating temp. range) :3dB
- Frequency/Temp. Coefficient(over operating temp. range) :6.5MHz

- Operating Temperature Range : -20°C to +55°C
- Storage Temperature Range : -30°C to +70°C
- Detection Range : 15M ~ 20M(Max.)
- Weight : 6 grams. Size(mm,+/-0.2) : 40.0 \* 47.0 \* 8.3
- CE" approval mark (CE ETSI EN 300 440: RF part) and "FCC" approval mark (PARTS 15.245) and "ROHS" approval mark



Rader Antenna Module

## C-Band Series

DNS-200, DNS-200S, DNS-200M  

### Receiver

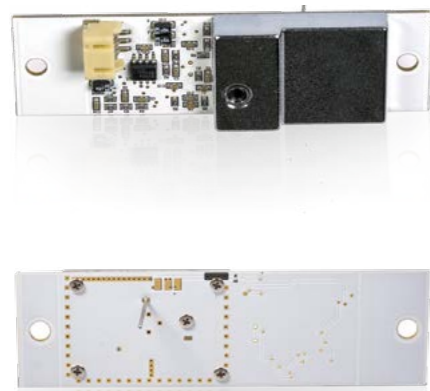
- C-Band Microwave Sensor Module
- Used a RF the Microwave Sensor.
- Applying the Doppler radar principle.
- CW Radar, ISM Band
- Small size.
- Used Pin Antenna & Amplifier Inclusion.
- Microwave technology.
- Low cost & Low Power Consumption.

### Specification

- Electrical characteristics.
- Operating Voltage : 4.7 ~ 5.3VDC.
- Operating Current : 10~20mA
- Center Frequency : 5.800GHz (5.75GHz ~ 5.85GHz)
- Output Power : < 10mW
- ABSOLUTE MAXIMUM RATINGS
- DC Input Voltage 5VDC(4.7 ~ 5.3VDC)
- Operating Temperature Range - 30 to +50°C
- Storage Temperature Range - 40 to +80°C
- Relative Humidity 95% at 35°C
- GENERAL CONTENTS
- Size 34mm \* 36mm \* 8.3mm(Pin Ant. : exclusion)
- Detection Range & Angle : (Wall) 15 ~ 20m (Max.) / 130'~ 150' (Ceiling) 10 ~ 15m Dia (Max.) / 360'
- Radiated MW Energy 10~30 micro Watt(at least)



DNS-200L



Rader Antenna Module

### Receiver

- C-Band Microwave Sensor Module
- Used a RF the Microwave Sensor.
- Applying the Doppler radar principle.
- CW Radar, ISM Band · Small size.
- Used Pin Antenna & Amplifier Inclusion.
- Microwave technology.
- Low cost & Low Power Consumption.

### Specification

- Electrical characteristics. · Operating Voltage : 4.7 ~ 5.3VDC.
- Operating Current : 10~20mA
- Center Frequency : 5.800GHz (5.75GHz ~ 5.85GHz)
- Output Power : < 10mW · ABSOLUTE MAXIMUM RATINGS
- DC Input Voltage 5VDC(4.7 ~ 5.3VDC)
- Operating Temperature Range - 30 to +50°C
- Storage Temperature Range - 40 to +80°C
- Relative Humidity 95% at 35°C · GENERAL CONTENTS
- Size 82mm \* 24mm \* 8.5mm(Pin Ant. : exclusion)
- Detection Range & Angle : (Wall) 15 ~ 20m (Max.) / 130'~ 150' (Ceiling) 10 ~ 15m Dia (Max.) / 360'
- Radiated MW Energy 10~30 micro Watt(at least)

## K-Band Series

DNS-060 

### Feature

- Doppler radar-based motion detector
- Available in different frequency ranges
- Advanced PHEMT-oscillator with low current consumption
- Split transmit and receive path for maximum gain
- Mono (single channel) operation for motion detection
- Very small outline dimensions

### DNS-060FM

### Feature

- Radar-based motion detector working in the 24GHz - ISM - Band.
- FMCW capable ; therefore measurement of distance as well as recognition of stationary objects is possible slit transmit and receive path for maximum gain
- Advanced VCO-oscillator with low current consumption
- Split transmit and receive path for maximum gain.
- Dual channel operation for direction of motion identification

### DNS-070DL

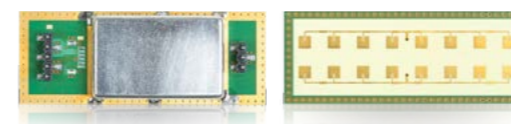
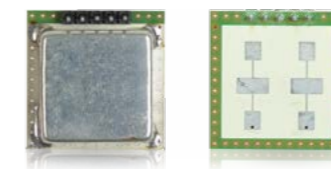
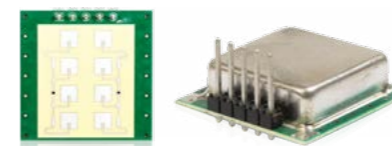
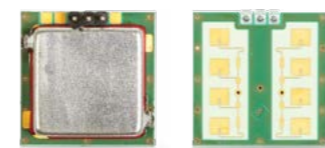
### Feature

- Doppler radar-based motion detector
- Available in different frequency ranges
- Advanced PHEMT-oscillator with low current consumption
- Split transmit and receive path for maximum gain
- Dual channel(I/Q) operation ·Very small outline dimensions

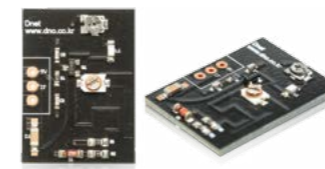
### DNS-080

### Feature

- 24 GHz short range transceiver
- Beam aperture 80°/12° · 250MHz wide sweep FM input
- Optional IF amplifier (DNS-080:V2)
- Narrow - wide asymmetrical field pattern
- High sensitive LNA receiver · I/Q IF outputs
- Compact size: 66mm x 25mm x 6mm



Rader Antenna Module



### Specification

- |  |   |   |   |
|--|---|---|---|
| <ul style="list-style-type: none"> <li>· Electrical characteristics</li> <li>· Operating Voltage : 4.5 ~ 5.3VDC</li> <li>· Operating Current : 5~10mA Center</li> <li>· Frequency 2.45GHz (2.30~2.80GHz)</li> <li>· Frequency Stability : 5MHz max. (-30°C to +55°C)</li> <li>· Output Power : + 5dBm E.I.R.P. type</li> </ul> | <ul style="list-style-type: none"> <li>· Return Loss Sensitivity : - 90dBc type</li> <li>· Antenna Beam width(-3dB) : E-plane 45 deg. nom. H-plane 70 deg. nom. Antenna Gain 4~5dbi</li> <li>· Pulse mode operation</li> <li>· Pluse Width</li> </ul> | <ul style="list-style-type: none"> <li>· Separate Pluse Control Input</li> <li>· Absolute Maximum Ratings</li> <li>· DC Input Voltage : 5.3Vdc</li> <li>· Operating Current : 10mA</li> <li>· Operating Temperature Range : - 30 to + 50°C</li> <li>· Storage Temperature Range : - 40 to + 80°C</li> </ul> | <ul style="list-style-type: none"> <li>· Relative Humidity 95% at 35°C</li> <li>· Vibration G=10</li> <li>· Shock G=20</li> <li>· GENERAL CONTENTS</li> <li>· Size 28mm * 20mm</li> <li>· Detection Range 8m(standard)</li> <li>· Radiated MW Energy 30 micro Watt(at least)</li> </ul> |
|--|---|---|---|

## S-Band Series

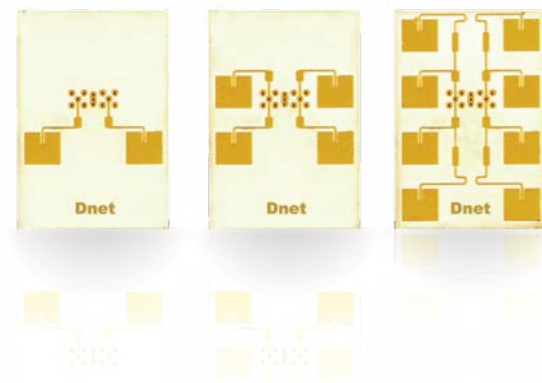
DNS-100  

### Feature

- Used a RF the Microwave Sensor Module.
- Applying the Doppler radar principle.
- ISM Band
- Small size(28mm \* 20mm).
- Microwave technology.
- Low cost & Low Power Consumption.

## K-Band Series

### DNS-300(1),300(3)/300F(1),300F(3)



#### Feature

- VCO Transceiver working in the 24GHz - ISM - Band
- Detection of direction and velocity as well as distance of moving and stationary objects
- Integrated Prescaler for easy frequency control
- Integrated Low Noise Amplifier
- Mounting by standard SMT-Process (delivery on Tape & Reel)
- Extended temperature range from -40°C up to +85°C
- Very small outline dimensions
- Available with different antenna patterns by same interface

#### Specification

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Radar</b>						
VCO frequency range		$f_{VCO}$	24.050		24.250	GHz
Tuning voltage	to cover VCO frequency range	$V_{tune}$	0.7		2.5	V
VCO tuning sensitivity	within VCO frequency range	$k_{VCO}$		720	2000	MHz/V
output power (EIRP)		$P_{out}$			20	dBm
IF output DC-Offset		$f_{1/2\_DC-offset}$	1.4	1.8	2.2	V
IF-Bandwidth (-3dB)		B	0		1M	Hz
signal level (RCS = 0.5m <sup>2</sup> @ 5m)		$f_{1/2}$	120		360	$\mu$ Vrms
noise level	100Hz...1kHz	$n_{1/2}$			20	$\mu$ Vrms
<b>Power supply</b>						
supply voltage		$V_{CC}$	3.2	3.3	3.4	V
supply current		$I_{CC}$		47	57	mA
<b>Frequency Divider</b>						
Prescaler division ratio	$V_{CC\_PTAT} = 0V$ ,	$D_{DIV}$	16			
	$V_{CC\_PTAT} = 3.3V$	$D_{DIV}$	8192			
Prescaler supply voltage		$V_{CC\_DIV}$	3.2	3.3	3.4	V
Prescaler supply current		$I_{CC\_DIV}$	19			mA
<b>Environment</b>						
operating temperature		$T_{OP}$	-40		+85	°C
storage temperature		$T_{STG}$	-40		+85	°C
<b>Mechanical Outlines</b>						
outline dimensions		Height	3.1			mm
		length	21.4			
		width	15.0			



## DDS-1500

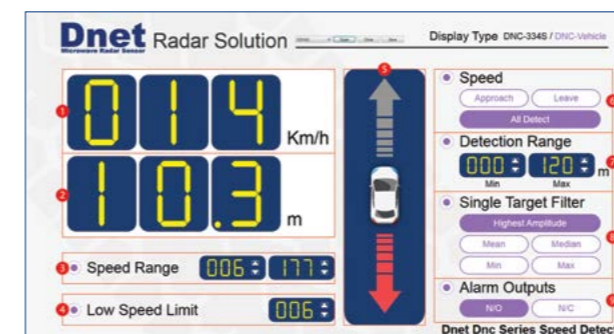
### K-Band Microwave Radar Sensor



#### Feature

- Measuring the distance of a moving object
- Configurable within the distance measuring range of 0.3m~150m and vehicle photographing distance configuration function
- Speed detection: 0.8km/h ~ 250km/h
- Speeding vehicle (speed) configuring function and camera shooting function
- Direction (forward/backward) identifiable and forward/backward direction selectable
- RS-232 communication interface
- Applicable facilities: In large factories, apartment complexes, general roads, etc.
- Shooting speeding vehicles can be used for the purpose of warning and controlling access

#### GUI Setting Program Display



- ① Speed display
- ② Distance display
- ③ Speed-range setting
- ④ Minimum-range setting
- ⑤ Detection target's direction display
- ⑥ Forward/backward direction selection both forward/backward
- ⑦ Distance setting function
- ⑧ Target filtering setting
- ⑨ Overall average Minimum speed Maximum speed
- ⑩ Relay No/NC setting (default RS-232) \*Option: RS-485

#### Reference

- This product is developed to proactively prevent the speeding of vehicles and motorcycles driving on the road and prevent traffic accidents by photographing speeding vehicles when measuring speeding, storing those pictures and notifying the drivers.
- This product especially enables a driver to judge whether or not his/her own vehicle is being photographed due to speeding by himself/herself (Red LED when photographing).
- This product is easy to install and displays the speed and distance of a vehicle by measuring those at the same time. It is a device with a totally difference concept from previously installed roof sensors.

#### Specification

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Radar</b>						
transmit frequency		f	24.000		24.250	GHz
output power (EIRP)		$P_{out}$			20	dBm
<b>Sensor</b>						
detection distance		dr			150	m
speed range		vr	0.8		250	Km/h
standard detection field	horizontal			34		°
	vertical			49		°
<b>Environment</b>						
operating temperature		TOP	-25		+60	°C
storage temperature		TSTG	-25		+60	°C

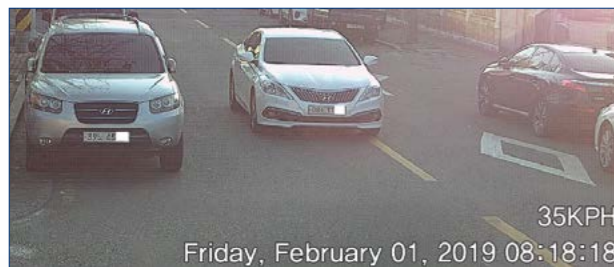
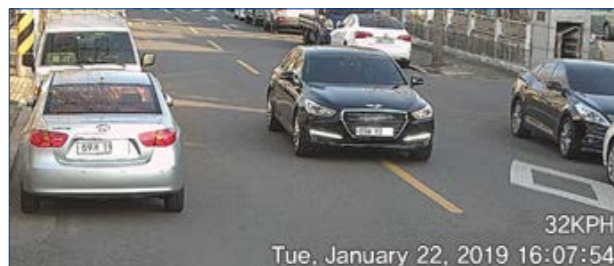
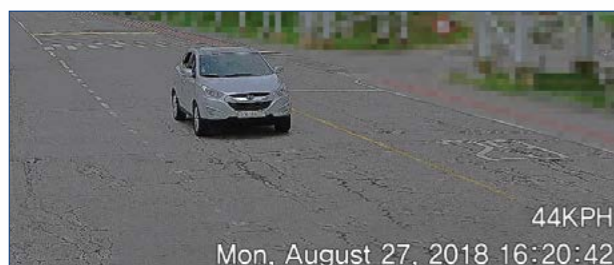
- \* Measuring the distance of a vehicle in real time
- \* Measuring the speed of a vehicle in real time
- \* Easy to install
- \* Convenient to move an installed position
- \* Traffic flow investigating function including setting the minimum/maximum speed of the slowest vehicle and setting the forward/backward direction by extracting the fastest vehicle, median speed and the foremost vehicle among several vehicles entering at the same time (see the setting screen on GUI screen).

### Examples of application of traffic interlocking system

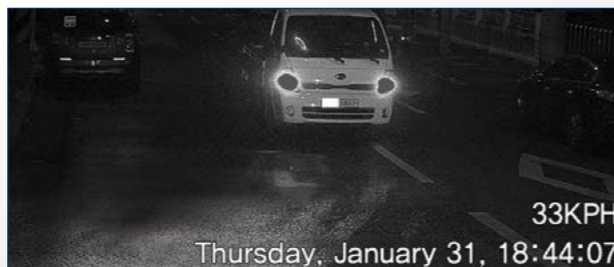
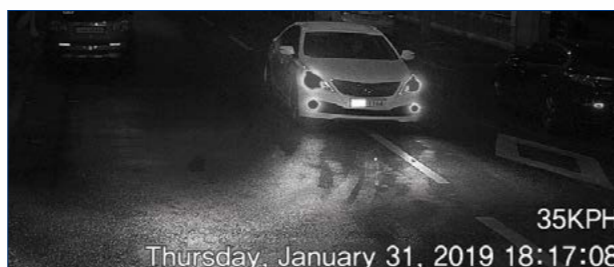
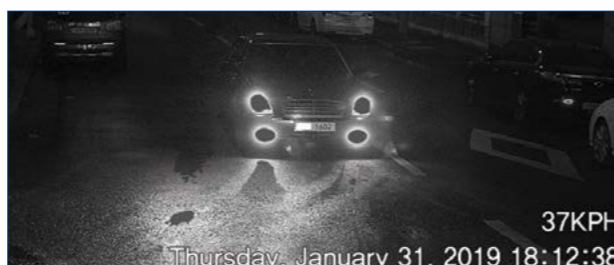
- Measuring the speed of a vehicle
- Measuring the speed and distance of a vehicle at the same time
- Photographing and saving the picture of a desired street when speeding [displaying the date, day, time and speed].



### Camera photography(daytime)



### Camera photography(nighttime)



## DNC-100C



### Feature

- It can:
  - Measure the distance of a moving object (crane, structure).
  - Configure within the distance measurement range of 0.3m~100m.
  - Detect speed: 0.1km/h~80km/h
  - Confirm the direction (forward/backward), and it can select the forward/backward direction.
  - RS-232 communication interface
  - Applicable facilities: Can sound a zone alarm by distance stage including in large factories, dockyards, and apartment construction sites

### Specification

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Radar</b>						
transmit frequency		f	24.000		24.250	GHz
output power (EIRP)		Pout			20	dBm
<b>Sensor</b>						
detection distance		dr			100	m
speed range		vr	0.1		80	Km/h
standard detection field		horizontal		34		°
		vertical		49		°
<b>Environment</b>						
operating temperature		TOP	-25		+60	°C
storage temperature		TSTG	-25		+60	°C

### Reference

· This product is a system preventing collision of cranes which is designed to prevent accidents in advance by preventing collisions of cranes installed on industrial sites.



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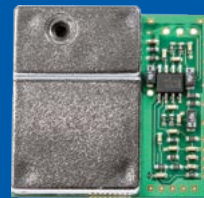
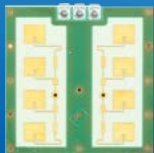
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**Dnet**  
Microwave Radar Sensor

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