

MNO SAMPLE DATA SHEET

PROTECTED

関係者外秘

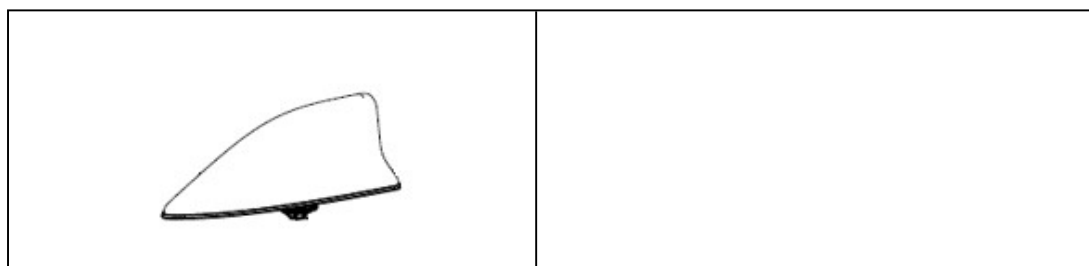
トヨタ自動車株式会社
 コネクティッドカンパニー
 コネクティッド基盤開発部
 第12 電子開発室 2G

Toyota Motor Corporation
 Connected Company
 Connected System Development Div.,
 Electronics Development Dept. No.12 2G,
 2023.03.29

Remarks;

This datasheet is released dedicated for North America MNO certification process for 24DCM.
 Please refer antenna setup guide regarding recommended setup method.
 The attached cable is designed as maximum cable loss which considers installation in vehicle.

Photo of the antenna



Cable loss value

Frequency (MHz)	Cable loss (dB)
663	2.4
700	2.5
748	2.6
798	2.7
849	2.7
880	2.8
915	2.9
1710	4.0
1785	4.1
1910	4.2
2025	4.4
2300	4.9
2400	5.1
2496	5.2
2595	5.3
2690	5.4
3300	6.1
3675	6.5
3975	7.0
4200	7.4
4400	7.4
4700	8.2
5000	8.5

※The antenna cable length is 6.0m.

Max gain for each frequency

Frequency (MHz)	Max Gain(dBi)			
	$\theta = 45^\circ$	$\theta = 60^\circ$	$\theta = 75^\circ$	$\theta = 90^\circ$
663	-3.2	-4.2	-1.2	-3.9
700	2.4	1.7	-0.2	-3.4
748	1.9	1.2	-0.9	-3.9
798	3.2	2.6	0.6	-1.5
849	2.8	1.4	-0.5	-3.3
880	2.3	1.9	-0.7	-3.9
915	3.0	2.9	0.3	-4.2
1710	1.0	5.0	3.5	-0.6
1785	2.0	4.2	3.4	-1.2
1910	0.9	4.2	4.1	-0.1
2025	0.8	4.5	4.0	0.0
2300	-0.2	2.5	4.8	2.2
2400	1.4	1.5	6.8	2.1
2496	1.6	2.9	5.9	1.1
2595	2.6	4.5	6.1	0.9
2690	1.8	3.2	6.7	1.8
3300	0.9	1.7	7.3	1.9
3675	5.4	3.1	6.0	1.0
3975	5.8	5.0	4.2	0.1
4200	4.0	4.7	5.8	0.8
4400	3.1	4.5	5.4	0.3
4700	3.9	4.1	3.8	0.6
5000	2.5	5.0	3.3	-1.0

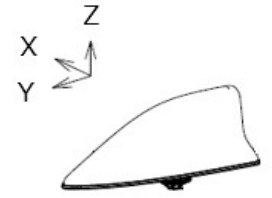
※The antenna gain is measured at the end of 150mm cable.

※The antenna gain is measured on the $\Phi = 1$ m ground plate.

※The antenna gain is measured with Sharkfin Cover on antenna.

Antenna radiation pattern of each frequency

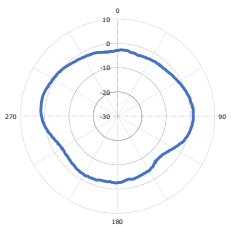
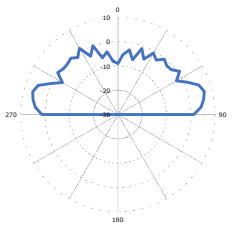
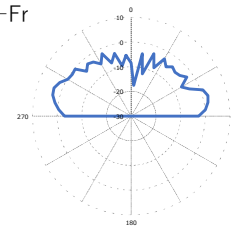
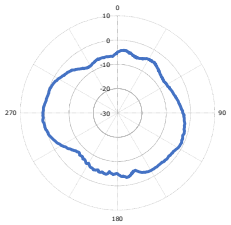
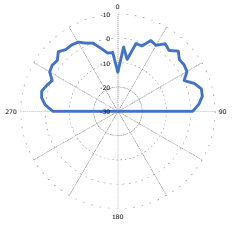
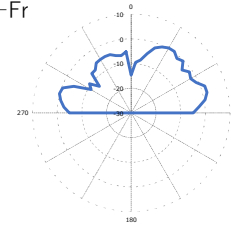
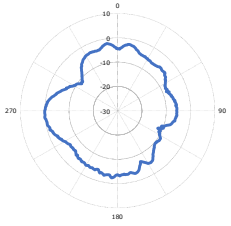
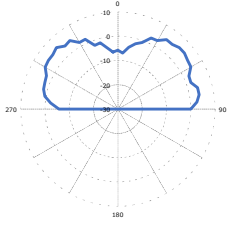
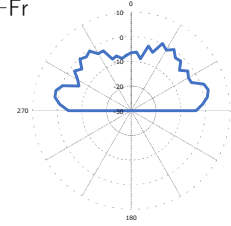
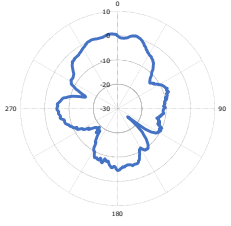
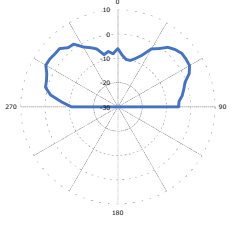
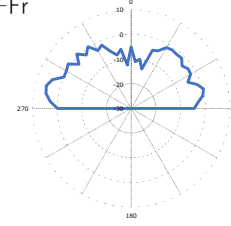
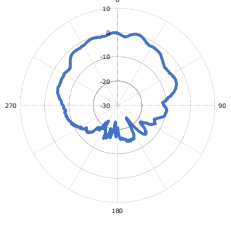
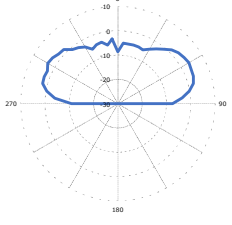
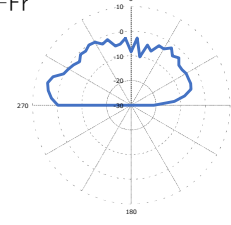
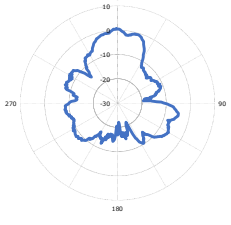
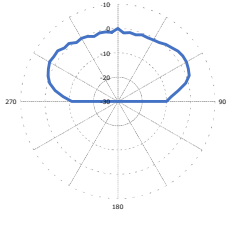
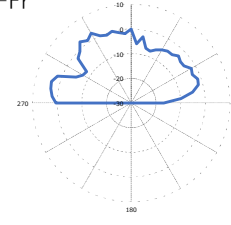
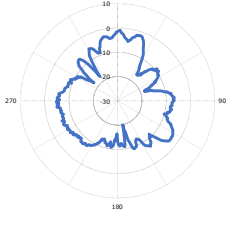
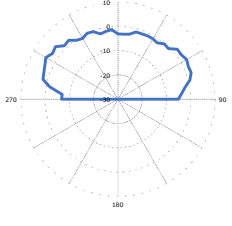
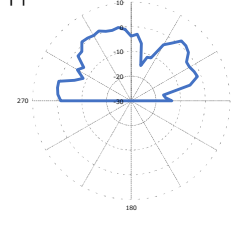
Frequency (MHz)	Antenna radiation pattern		
	X-Y	Y-Z	Z-X
663	↑ Fr 		← Fr
700	↑ Fr 		← Fr
748	↑ Fr 		← Fr
798	↑ Fr 		← Fr
849	↑ Fr 		← Fr
880	↑ Fr 		← Fr
915	↑ Fr 		← Fr
1710	↑ Fr 		← Fr



Antenna radiation pattern of each frequency

Frequency (MHz)	Antenna radiation pattern		
	X-Y	Y-Z	Z-X
1785	<p>↑ Fr</p>		<p>← Fr</p>
1910	<p>↑ Fr</p>		<p>← Fr</p>
2025	<p>↑ Fr</p>		<p>← Fr</p>
2300	<p>↑ Fr</p>		<p>← Fr</p>
2400	<p>↑ Fr</p>		<p>← Fr</p>
2496	<p>↑ Fr</p>		<p>← Fr</p>
2595	<p>↑ Fr</p>		<p>← Fr</p>
2690	<p>↑ Fr</p>		<p>← Fr</p>

Antenna radiation pattern of each frequency

Frequency (MHz)	Antenna radiation pattern		
	X-Y	Y-Z	Z-X
3300	↑ Fr 		← Fr 
3675	↑ Fr 		← Fr 
3975	↑ Fr 		← Fr 
4200	↑ Fr 		← Fr 
4400	↑ Fr 		← Fr 
4700	↑ Fr 		← Fr 
5000	↑ Fr 		← Fr 

※The antenna gain is measured at the end of 150mm cable.

※The antenna gain is measured on the $\Phi = 1$ m ground plate.

※The antenna gain is measured with Sharkfin Cover on antenna.

※The Radiation Pattern is plotted with data of "total gain of the antenna".

24CY IP-1 Antenna Data Sheet

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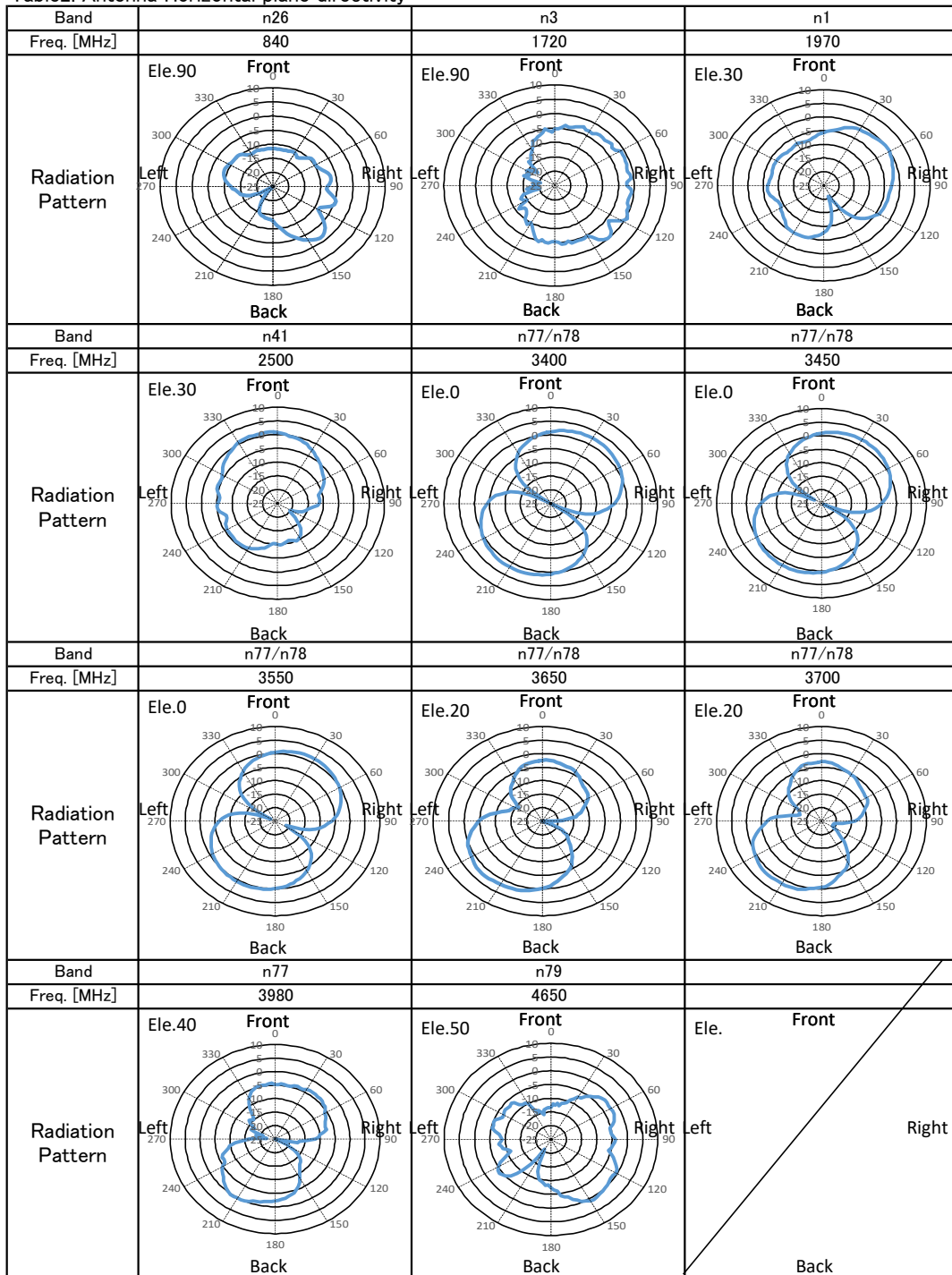
Electronics Development Dept. No.12
Connected System Development Div.
TOYOTA MOTOR CORPORATION

1. Antenna Name
I/P Integration Antenna
2. Manufacturer
MITSUMI ELECTRIC CO., LTD.
3. Model name
DEPB2-10027
4. Antenna Specification
 - Antenna maximum gain of each Band (Transmission band)
 - Radiation pattern including maximum gain direction

Table1. Antenna Specification

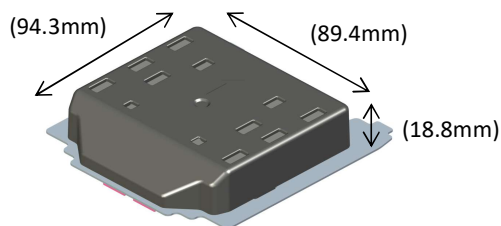
Band	n26		n3		n1	
Freq. [MHz]	840		1720		1970	
MAX [dBi]	-1.5		0.6		-0.1	
Radiation Pattern						
Band	n41		n77/n78		n77/n78	
Freq. [MHz]	2500		3400		3450	
MAX [dBi]	1.1		2.5		2.2	
Radiation Pattern						
Band	n77/n78		n77/n78		n77/n78	
Freq. [MHz]	3550		3650		3700	
MAX [dBi]	1.6		2.3		1.7	
Radiation Pattern						
Band	n77		n79			
Freq. [MHz]	3980		4650			
MAX [dBi]	0.3		1.0			
Radiation Pattern					Zenith 	

Table2. Antenna Horizontal plane directivity



5. Antenna Outline and Connector information

• Outline



• Connector

GT36AC

Made by HIROSE ELECTRIC CO.,LTD.

6. Antenna model and model code (Refer to Ministry of Internal Affairs and Communications Notification No. 356 Appended Table No. 19)

code classification	Model code
1 Separate:	M
2 Basic:	DP
3 Additional:	D
4 Polarization:	VH
5 SD Code:	N
6 Trackin method	N

←This is not done by the antenna itself, but please check with the system side.

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7. Element length

94.3 mm

←Element length from feeding point

[Connection cable information]

8. Antenna connection cable loss in each frequency band (minimum value)

Type	[dB]		
	n26	n3	n1
2.5D	1.5	2.0	2.0
	n41	n77	n79
	2.5	3.7	4.0

@2000mm Coaxial