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Maximum Permissible Exposure Evaluation

FCC ID: NKS-S597

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

EUT Specification

EUT	DVR S597
Frequency band (Operating)	☒WLAN: 2.412GHz ~ 2.462GHz ☒WCDMA Band II, Band IV, Band V ☒LTE FDD Band 2, Band 4, Band 5, Band 12 ☐Others
Device category	☐Portable (<20cm separation) ☐Mobile (>20cm separation) ☒Fixed (>20cm separation) ☐Others ___
Exposure classification	☐Occupational/Controlled exposure (S=5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☒Single antenna ☐Multiple antennas ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Max. output power	WIFI: 19.32dBm WCDMA Band II: 23.98dBm Band IV: 24.00dBm Band V: 23.98dBm LTE FDD Band 2: 24.93dBm FDD Band 4: 24.68dBm FDD Band 5: 25.92dBm FDD Band 12: 25.98dBm
Antenna gain (Max)	WIFI: 1.5dBi WCDMA II: 4.16dBi WCDMA IV: 4.16dBi WCDMA V: 3.34dBi LTE FDD Band 2: 4.16dBi LTE FDD Band 4: 4.16dBi LTE FDD Band 5: 3.34dBi LTE FDD Band 12: 3.34dBi
Evaluation applied	☒MPE Evaluation ☐SAR Evaluation

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)
Where
Pd= Power density in mW/cm^2
Pout=output power to antenna in mW
G= gain of antenna in linear scale
Pi=3.1416
R= distance between observation point and center of the radiator in cm
Pd the limit of MPE 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Operating Mode	Channel Frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11b	2462.0	18.32	18.32±1	19.32	1.50	0.02403	1
802.11g	2412.0	15.65	15.65±1	16.65	1.50	0.01299	1
802.11n (HT20)	2462.0	14.67	14.67±1	15.67	1.50	0.01037	1
802.11n (HT40)	2437.0	14.28	14.28±1	15.28	1.50	0.00948	1
WCDMA II	1880.0	22.98	22.98±1	23.98	4.16	0.12964	1
WCDMA IV	1752.6	23.00	23.00±1	24.00	4.16	0.13024	1
WCDMA V	846.6	22.98	22.98±1	23.98	3.34	0.08526	0.5624
FDD Band 2	1880.0	22.93	22.93±1	23.93	4.16	0.12816	1
FDD Band 4	1710.7	22.67	22.68±1	23.68	4.16	0.12099	1
FDD Band 5	836.5	23.92	23.92±1	24.92	3.34	0.16097	0.5577
FDD Band 12	711.0	23.98	23.98±1	24.98	3.34	0.16321	0.4740

[Σ of (The highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [Σ of MPE ratios] is ≤ 1.0.

The worst RF Exposure Evaluation						
Worst Calculation Value (dBm)		Σ^1	Σ^2	Calculation Value	Total Calculation Value	Limit
WIFI	19.32	0.05344	0.02403	0.07747	0.3647	1
WCDMA	24.00	0.15699	0.13024	0.28723		
WIFI	19.32	0.05344	0.02403	0.07747	0.43741	1
LTE	24.98	0.19673	0.16321	0.35994		

Note: Σ^1: The highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance / 1.6 W/kg.

Σ^2: Max MPE ratios.

Because the WIFI and WCDMA, WIFI and LTE can be operated simultaneously, for detailed calculation results please refer to the table above, so standalone SAR measurements are not required.

Note

For a more detailed features description, please refer to the RF Test Report.

**********THE END**********