

## 1.3 Power Consumption

This section measures the power dissipation of the product and the loading of power supply in order to ensure reasonable total thermal power readings.

- Power modes
  - DOS mode: Stay at BIOS setup menu. (BIOS load setup defaults)
  - Idle Load: Stay at Windows® OS login prompt.
  - Max. Load: Run Intel TAT to get maximum power consumption. (CPU-All workload 100 levels + Gfx component workload 100 levels + Memory workload 100 levels).
  - S3: Suspend to RAM
  - S5: Soft off (shutdown from Windows OS)
- Measurement conditions:
  - BIOS restore to default setting. (CPU EIST and turbo features are enabled.)
  - Operating System and Settings:
    - Windows OS 64-bit
    - Display resolution: Optimal preset resolution of display module
    - Power plan: Balanced mode (Windows OS default)
    - Installed on SATA in AHCI mode
  - Touch monitor settings:
    - Loads all settings of monitor to default.
  - All tests need to be kept running for 10 minutes and then record the average current value and the actual voltage value.
- The power consumption calculate rule: (average current) x (real voltage) = Watt

Measurement Tool/Equipment	
Oscilloscope/Probe	PROVA CM-02 AC/DC Clamp Meter
Multi-meter	Agilent 34411A Digital Multimeter
Utility	Intel® Thermal Analysis Tool V6.5.1002

System Configurations	
CPU	Intel® Core™ i5-7300U Processor 2.6GHz (3M Cache, up to 3.50 GHz)
BIOS Version	PC400R01
Memory DIMM	Innodisk M4S0-AGS1O5SJ 16G DDR4-2400 W/T SO-DIMM Chip: SEC 801 K4A8G08 5WB BCRC
SATA SSD	WD Blue PC SSD WDS250G1B0A 2.5" SATA SSD 250GB

Operating System	Microsoft® Windows® 10 Enterprise Evaluation 64-bit (Version 1903/OS build:18362.30 )	
Integrated Graphics	Processor Graphics Intel® HD Graphics 620	
Graphics Driver	25.20.100.6323	
USB Keyboard	Logitech USB Keyboard K120 Y-BP62a	
USB Mouse	Logitech M-U0027-O USB Mouse	
Power Adapter #1	for DUT# 1,2,3,4,5,6,7,8,10,12, 13,14,15,16,17,18,20	MEAM WELL Adapter GSM60A12-P1J Input: 100-240VAC,50-60Hz,1.4-0.7A Output: 12V,5.0A 60W MAX
Power Adapter #2	for DUT# 9,11,19,21	MEAM WELL Adapter GST120A24-CT AC Input: 100-240VAC,50-60Hz,1.4A DC Output: 24V,5.0A 120W MAX
<b>VIO-series display module configurations</b>		
Display module(DUT#1)	VIO-110C/R-11 Resistive/Projected Capacitive touch display module ( 10.4" , 4:3 , 800 x 600 )	
Display module(DUT#2)	VIO-112C/R Resistive/Projected Capacitive touch display module ( 12.1" , 4:3 , 1024 x 768 )	
Display module(DUT#3)	VIO-115C/R Resistive/Projected Capacitive touch display module ( 15" , 4:3 , 1024 x 768 )	
Display module(DUT#4)	VIO-115HC/HR Resistive/Projected Capacitive touch display module ( 15" , 4:3 , 1024 x 768 )	
Display module(DUT#5)	VIO-W115C/R Resistive/Projected Capacitive touch display module ( 15.6" , 16:9 , 1920 x 1080 )	
Display module(DUT#6)	VIO-117C/R Resistive/Projected Capacitive touch display module ( 17" , 4:3 , 1280 x 1024 )	
Display module(DUT#7)	VIO-117HC/HR Resistive/Projected Capacitive touch display module ( 17" , 4:3 , 1280 x 1024 )	
Display module(DUT#8)	VIO-119C/R Resistive/Projected Capacitive touch display module ( 19" , 4:3 , 1280 x 1024 )	
Display module(DUT#9)	VIO-119HC/HR Resistive/Projected Capacitive touch display module ( 19" , 4:3 , 1280 x 1024 )	
Display module(DUT#10)	VIO-W121C/R Resistive/Projected Capacitive touch display module ( 21.5" , 16:9 , 1920 x 1080)	
Display module(DUT#11)	VIO-W121HC/HR Resistive/Projected Capacitive touch display module ( 21.5" , 16:9 , 1920 x 1080)	
Display module(DUT#12)	VIO-212C/R-11 Resistive/Projected Capacitive touch display module ( 12.1" , 4:3 , 1024 x 768)	
Display module(DUT#13)	VIO-215C/R Resistive/Projected Capacitive touch display module ( 15" , 4:3 , 1024 x 768)	
Display module(DUT#14)	VIO-215HC/HR Resistive/Projected Capacitive touch display module ( 15" , 4:3 , 1024 x 768)	
Display module(DUT#15)	VIO-W215C/R Resistive/Projected Capacitive touch display module ( 15.6" , 16:9 , 1920 x 1080)	
Display module(DUT#16)	VIO-217C/R Resistive/Projected Capacitive touch display module ( 17" , 4:3 , 1280 x 1024)	
Display module(DUT#17)	VIO-217HC/HR Resistive/Projected Capacitive touch display module ( 17" , 4:3 , 1280 x 1024)	

Display module(DUT#18)	VIO-219C/R Resistive/Projected Capacitive touch display module ( 19" , 4:3 , 1280 x 1024)
Display module(DUT#19)	VIO-219HC/HR Resistive/Projected Capacitive touch display module ( 19" , 4:3 , 1280 x 1024)
Display module(DUT#20)	VIO-W221C/R Resistive/Projected Capacitive touch display module ( 21.5" , 16:9 , 1920 x 1080)
Display module(DUT#21)	VIO-W221HC/HR Resistive/Projected Capacitive touch display module ( 21.5" , 16:9 , 1920 x 1080)

**DUT #1: VIO-110C/R-11**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.04	1.35	16.25
Idle mode	12.05	0.95	11.45
Maximum Load	12.02	2.25	27.04
Suspend to RAM (S3)	12.08	0.10	1.21
Soft Off (S5)	12.08	0.08	0.97

**DUT #2,12: VIO-112C/R & VIO-212C/R-11**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.04	1.45	17.46
Idle mode	12.05	1.05	12.65
Maximum Load	12.02	2.45	29.45
Suspend to RAM (S3)	12.08	0.15	1.81
Soft Off (S5)	12.08	0.13	1.57

**DUT #3,13: VIO-115C/R & VIO-215C/R**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.03	1.58	19.01
Idle mode	12.04	1.20	14.45
Maximum Load	12.00	2.58	30.96
Suspend to RAM (S3)	12.08	0.10	1.21

Soft Off (S5)	12.08	0.08	0.97
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**DUT #4,14: VIO-115HC/HR & VIO-215HC/HR**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.02	2.05	24.64
Idle mode	12.02	1.65	19.83
Maximum Load	12.00	3.05	36.6
Suspend to RAM (S3)	12.08	0.10	1.21
Soft Off (S5)	12.08	0.08	0.97

**DUT #5,15: VIO-W115C/R & VIO-W215C/R**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.02	1.91	22.96
Idle mode	12.03	1.52	18.28
Maximum Load	11.98	2.95	35.34
Suspend to RAM (S3)	12.08	0.14	1.69
Soft Off (S5)	12.08	0.10	1,21

**DUT #6,16: VIO-117C/R & VIO-217C/R**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	11.99	2.25	26.98
Idle mode	12.02	1.85	22.23
Maximum Load	11.98	3.20	38.34
Suspend to RAM (S3)	12.08	0.09	1.09
Soft Off (S5)	12.08	0.08	0.97

**DUT #7,17: VIO-117HC/HR & VIO-217HC/HR**

Test Item	+12V	Power
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	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	11.98	3.16	37.85
Idle mode	12.00	2.71	32.52
Maximum Load	11.94	4.20	50.15
Suspend to RAM (S3)	12.08	0.10	1.21
Soft Off (S5)	12.07	0.08	0.97

**DUT #8,18: VIO-119C/R & VIO-219C/R**

Test Item	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	12.00	2.13	25.56
Idle mode	12.01	1.82	21.86
Maximum Load	11.97	3.25	38.9
Suspend to RAM (S3)	12.07	0.10	1.21
Soft Off (S5)	12.07	0.09	1.09

**DUT #9,19: VIO-119HC/HR & VIO-219HC/HR**

Test Item	+24V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	23.75	1.85	43.94
Idle mode	23.76	1.62	38.49
Maximum Load	23.74	2.25	53.41
Suspend to RAM (S3)	23.84	0.05	1.19
Soft Off (S5)	23.84	0.03	0.72

**DUT #10,20: VIO-W121C/R & VIO-W221C/R**

Test Item(DUT#6)	+12V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	11.99	2.65	31.77
Idle mode	12.01	2.27	27.26

Maximum Load	11.96	3.71	44.37
Suspend to RAM (S3)	12.08	0.11	1.41
Soft Off (S5)	12.08	0.10	1.21

**DUT #11,21: VIO-W121HC/HR & VIO-W221HC/HR**

Test Item(DUT#6)	+24V		Power Consumption (W)
	Voltage(V)	Current(A)	
DOS mode (BIOS setup menu)	23.72	2.45	58.11
Idle mode	23.73	2.25	53.39
Maximum Load	23.70	2.95	69.92
Suspend to RAM (S3)	23.84	0.06	1.43
Soft Off (S5)	23.84	0.02	0.48