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NVIDIA GeForce RTX 2080 Ti

TU102 GRAPHICS PROCESSOR	4352 CORES	272 TMUS	88 ROPS	11 GB MEMORY SIZE	GDDR6 MEMORY TYPE	352 bit BUS WIDTH
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Recommended Gaming Resolutions:

■ 1920x1080
 ■ 2560x1440
 ■ 3840x2160

The GeForce RTX 2080 Ti is an enthusiast-class graphics card by NVIDIA, launched on September 20th, 2018. Built on the 12 nm process, and based on the TU102 graphics processor, in its TU102-300A-K1-A1 variant, the card supports DirectX 12 Ultimate. This ensures that all modern games will run on GeForce RTX 2080 Ti. Additionally, the DirectX 12 Ultimate capability guarantees support for hardware-raytracing, variable-rate shading and more, in upcoming video games. The TU102 graphics processor is a large chip with a die area of 754 mm² and 18,600 million transistors. Unlike the fully unlocked TITAN RTX, which uses the same GPU but has all 4608 shaders enabled, NVIDIA has disabled some shading units on the GeForce RTX 2080 Ti to reach the product's target shader count. It features 4352 shading units, 272 texture mapping units, and 88 ROPs. Also included are 544 tensor cores which help improve the speed of machine learning applications. The card also has 68 raytracing acceleration cores. NVIDIA has paired 11 GB GDDR6 memory with the GeForce RTX 2080 Ti, which are connected using a 352-bit memory interface. The GPU is operating at a frequency of 1350 MHz, which can be boosted up to 1545 MHz, memory is running at 1750 MHz (14 Gbps effective).

Being a dual-slot card, the NVIDIA GeForce RTX 2080 Ti draws power from 2x 8-pin power connectors, with power draw rated at 250 W maximum. Display outputs include: 1x HDMI 2.0, 3x DisplayPort 1.4a, 1x USB Type-C. GeForce RTX 2080 Ti is connected to the rest of the system using a PCI-Express 3.0 x16.

Graphics Processor	Graphics Card	Clock Speeds
GPU Name: TU102	Release Date: Sep 20th, 2018	Base Clock: 1350 MHz
GPU Variant: TU102-300A-K1-A1	Generation: GeForce 20	Boost Clock: 1545 MHz
Architecture: Turing	Predecessor: GeForce 10	Memory Clock: 1750 MHz 14 Gbps effective
Foundry: TSMC	Successor: GeForce 30	Memory
Process Size: 12 nm	Production: Active	Memory Size: 11 GB
Transistors: 18,600 million	Launch Price: 999 USD	Memory Type: GDDR6
Density: 24.7M / mm ²	Current Price: Amazon / Newegg	Memory Bus: 352 bit
Die Size: 754 mm ²	Bus Interface: PCIe 3.0 x16	Bandwidth: 616.0 GB/s

Relative Performance		
Arc B580		88% ▲
GeForce RTX 3060 Ti		89%
Radeon RX 6700 XT		93%
Radeon RX 6750 XT		98%
GeForce RTX 4060 Ti 8 ...		99%
GeForce RTX 2080 Ti		100%
GeForce RTX 3070		105%
GeForce RTX 3070 Ti		112%
Radeon RX 7700 XT		113%
Radeon RX 6800		115%
GeForce RTX 4070		128% ▼
Based on TPU review data: "Performance Summary" at 1920x1080, 4K for 2080 Ti and faster.		

Board Design	
Slot Width:	Dual-slot
Length:	267 mm 10.5 inches
Width:	116 mm 4.6 inches
Height:	35 mm 1.4 inches
TDP:	250 W
Suggested PSU:	600 W
Outputs:	1x HDMI 2.0 3x DisplayPort 1.4a 1x USB Type-C
Power Connectors:	2x 8-pin
Board Number:	PG150 SKU 32

Graphics Features	
DirectX:	12 Ultimate (12_2)
OpenGL:	4.6
OpenCL:	3.0
Vulkan:	1.3
CUDA:	7.5
Shader Model:	6.8

Render Config	
Shading Units:	4352
TMUs:	272
ROPs:	88
SM Count:	68
Tensor Cores:	544
RT Cores:	68
L1 Cache:	64 KB (per SM)
L2 Cache:	5.5 MB

Theoretical Performance	
Pixel Rate:	136.0 GPixel/s
Texture Rate:	420.2 GTexel/s
FP16 (half):	26.90 TFLOPS (2:1)
FP32 (float):	13.45 TFLOPS
FP64 (double):	420.2 GFLOPS (1:32)

Card Notes
TU102-300-K1-A1 are Normal Chips (no factory OC permitted). TU102-300A-K1-A1 are Binned Chips (factory OC permitted). Both support manual overclocking

TU102 GPU Notes
Ray Tracing Cores: 1st Gen Tensor Cores: 2nd Gen NVENC: 7th Gen NVDEC: 4th Gen PureVideo HD: VP10 VDPAU: Feature Set J Latest Drivers: Windows 7 / 8 / 8.1 (x64): GeForce Release 474.89 Quadro Release R440 U3 (441.28) Data Center Release 426.32 Windows 10 / 11 (x64): GeForce Release: Latest Quadro Release: Latest Data Center Release: Latest

Retail boards based on this design (133)
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Name	GPU Clock	Boost Clock	Memory Clock	Other Changes	
ASL RTX 2080 Ti Ares	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches	
ASUS DUAL RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot	
ASUS DUAL RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot	
ASUS DUAL RTX 2080 Ti Advanced	1350 MHz	1560 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot	
ASUS DUAL RTX 2080 Ti OC	1350 MHz	1635 MHz	1750 MHz		
ASUS ROG MATRIX RTX 2080 Ti Platinum	 1350 MHz	1800 MHz	1850 MHz	310 mm/12.2 inches, Triple-slot, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS ROG STRIX RTX 2080 Ti Call of Duty BO4	1350 MHz	1650 MHz	1750 MHz	305 mm/12 inches, Triple-slot	
ASUS ROG STRIX RTX 2080 Ti GAMING	1350 MHz	1545 MHz	1750 MHz	300 mm/11.8 inches, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS ROG STRIX RTX 2080 Ti GAMING ADVANCED	1350 MHz	1575 MHz	1750 MHz	305 mm/12 inches, Triple-slot, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS ROG STRIX RTX 2080 Ti GAMING OC	 1350 MHz	1650 MHz	1750 MHz	300 mm/11.8 inches, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS ROG STRIX RTX 2080 Ti GAMING WHITE OC	1350 MHz	1740 MHz	1750 MHz	300 mm/11.8 inches, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS ROG STRIX RTX 2080 Ti GAMING WHITE OC Rev. 2	1350 MHz	1650 MHz	1850 MHz	305 mm/12 inches, Triple-slot, 2x HDMI 2x DisplayPort 1x USB Type-C	
ASUS TURBO RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	269 mm/10.6 inches	
Colorful iGame RTX 2080 Ti Advanced	1350 MHz	1545 MHz	1750 MHz		
Colorful iGame RTX 2080 Ti Advanced Lite	1350 MHz	1545 MHz	1750 MHz	315 mm/12.4 inches, Triple-slot	
Colorful iGame RTX 2080 Ti Advanced OC	1350 MHz	1635 MHz	1750 MHz		
Colorful iGame RTX 2080 Ti Advanced Water Cooled	1350 MHz	1545 MHz	1750 MHz		
Colorful iGame RTX 2080 Ti KUDAN	1350 MHz	1815 MHz	1750 MHz	317 mm/12.5 inches, Triple-slot	
Colorful iGame RTX 2080 Ti Neptune OC	1350 MHz	1740 MHz	1750 MHz	247 mm/9.7 inches	
Colorful iGame RTX 2080 Ti Overseas	1350 MHz	1545 MHz	1750 MHz		
Colorful iGame RTX 2080 Ti RNG Edition	1350 MHz	1740 MHz	1750 MHz	317 mm/12.5 inches, Triple-slot	
Colorful iGame RTX 2080 Ti Vulcan	1350 MHz	1545 MHz	1750 MHz	318 mm/12.5 inches, Triple-slot	
Colorful iGame RTX 2080 Ti Vulcan X OC	1350 MHz	1770 MHz	1750 MHz		
Colorful RTX 2080 Ti Turbo	1350 MHz	1545 MHz	1750 MHz	280 mm/11 inches	
Dell RTX 2080 Ti OEM	1350 MHz	1545 MHz	1750 MHz		
Digital Alliance RTX 2080 Ti OC	1350 MHz	1650 MHz	1750 MHz	292 mm/11.5 inches	

▼ Name	GPU Clock	Boost Clock	Memory Clock	Other Changes
ELSA RTX 2080 Ti ERAZOR GAMING	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot
ELSA RTX 2080 Ti ST	1350 MHz	1545 MHz	1750 MHz	266 mm/10.5 inches
EMTEK RTX 2080 Ti Black Edition OC	1350 MHz	1650 MHz	1750 MHz	292 mm/11.5 inches
EVGA RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	266 mm/10.5 inches
EVGA RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	266 mm/10.5 inches
EVGA RTX 2080 Ti Black	1350 MHz	1545 MHz	1750 MHz	269 mm/10.6 inches
EVGA RTX 2080 Ti Black	1350 MHz	1545 MHz	1750 MHz	269 mm/10.6 inches
EVGA RTX 2080 Ti FTW3	1350 MHz	1545 MHz	1750 MHz	Triple-slot
EVGA RTX 2080 Ti FTW3 Ultra	 1350 MHz	1755 MHz	1750 MHz	Triple-slot
EVGA RTX 2080 Ti FTW3 Ultra Hybrid	1350 MHz	1755 MHz	1750 MHz	291 mm/11.5 inches
EVGA RTX 2080 Ti FTW3 Ultra HYDRO COPPER	1350 MHz	1755 MHz	1750 MHz	
EVGA RTX 2080 Ti KINGPIN	1350 MHz	1770 MHz	1750 MHz	291 mm/11.5 inches, 1x HDMI 1x DisplayPort 2x mini-DisplayPort 1x USB Type-C
EVGA RTX 2080 Ti XC	1350 MHz	1635 MHz	1750 MHz	269 mm/10.6 inches
EVGA RTX 2080 Ti XC Black	1350 MHz	1560 MHz	1750 MHz	269 mm/10.6 inches
EVGA RTX 2080 Ti XC HYBRID	1350 MHz	1635 MHz	1750 MHz	
EVGA RTX 2080 Ti XC HYDRO COPPER	1350 MHz	1545 MHz	1750 MHz	266 mm/10.5 inches
EVGA RTX 2080 Ti XC Ultra	 1350 MHz	1650 MHz	1750 MHz	269 mm/10.6 inches, Triple-slot
EVGA RTX 2080 Ti XC2	1350 MHz	1545 MHz	1750 MHz	Triple-slot
EVGA RTX 2080 Ti XC2 Ultra	1350 MHz	1650 MHz	1750 MHz	269 mm/10.6 inches, Triple-slot
Gainward GameSoul RTX 2080 Ti Geek Edition	1350 MHz	1755 MHz	1750 MHz	312 mm/12.3 inches
Gainward RTX 2080 Ti Glare	1350 MHz	1545 MHz	1750 MHz	331 mm/13 inches
Gainward RTX 2080 Ti Glare OC	1350 MHz	1545 MHz	1750 MHz	331 mm/13 inches
Gainward RTX 2080 Ti Phoenix	1350 MHz	1575 MHz	1750 MHz	292 mm/11.5 inches
Gainward RTX 2080 Ti Phoenix GS	1350 MHz	1650 MHz	1750 MHz	292 mm/11.5 inches
GALAX RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	
GALAX RTX 2080 Ti Dual Black	1350 MHz	1545 MHz	1750 MHz	
GALAX RTX 2080 Ti General	1350 MHz	1545 MHz	1750 MHz	318 mm/12.5 inches
GALAX RTX 2080 Ti HOF	1350 MHz	1755 MHz	1750 MHz	330 mm/13 inches

▼ Name	GPU Clock	Boost Clock	Memory Clock	Other Changes
GALAX RTX 2080 Ti HOF 10th Anniversary	1350 MHz	1740 MHz	1750 MHz	320 mm/12.6 inches
GALAX RTX 2080 Ti HOF Limited Edition	1350 MHz	1815 MHz	1750 MHz	330 mm/13 inches
GALAX RTX 2080 Ti HOF OC LAB WC Edition	1350 MHz	1755 MHz	1750 MHz	320 mm/12.6 inches
GALAX RTX 2080 Ti HOF Plus	1350 MHz	1755 MHz	1750 MHz	330 mm/13 inches
GALAX RTX 2080 Ti OC	1350 MHz	1620 MHz	1750 MHz	
GALAX RTX 2080 Ti OC White	1350 MHz	1620 MHz	1750 MHz	
GALAX RTX 2080 Ti SG Edition	1350 MHz	1680 MHz	1750 MHz	308 mm/12.1 inches
GIGABYTE AORUS RTX 2080 Ti	1350 MHz	1695 MHz	1750 MHz	290 mm/11.4 inches, Triple-slot, 3x HDMI 3x DisplayPort 1x USB Type-C
GIGABYTE AORUS RTX 2080 Ti GAMING BOX	1350 MHz	1545 MHz	1750 MHz	300 mm/11.8 inches
GIGABYTE AORUS RTX 2080 Ti TURBO	1350 MHz	1650 MHz	1750 MHz	271 mm/10.7 inches
GIGABYTE AORUS RTX 2080 Ti XTREME	1350 MHz	1770 MHz	1767 MHz	290 mm/11.4 inches, 3x HDMI 3x DisplayPort 1x USB Type-C
GIGABYTE AORUS RTX 2080 Ti XTREME WaterForce	1350 MHz	1770 MHz	1767 MHz	290 mm/11.4 inches, 3x HDMI 3x DisplayPort 1x USB Type-C
GIGABYTE AORUS RTX 2080 Ti XTREME WaterForce WB	1350 MHz	1770 MHz	1767 MHz	292 mm/11.5 inches, 3x HDMI 3x DisplayPort 1x USB Type-C
GIGABYTE RTX 2080 Ti GAMING OC	1350 MHz	1650 MHz	1750 MHz	287 mm/11.3 inches, Triple-slot
GIGABYTE RTX 2080 Ti Turbo	1350 MHz	1545 MHz	1750 MHz	272 mm/10.7 inches
GIGABYTE RTX 2080 Ti Turbo OC	1350 MHz	1620 MHz	1750 MHz	272 mm/10.7 inches
GIGABYTE RTX 2080 Ti Turbo Rev. 2.1	1350 MHz	1545 MHz	1750 MHz	272 mm/10.7 inches
GIGABYTE RTX 2080 Ti WindForce	1350 MHz	1545 MHz	1750 MHz	280 mm/11 inches
GIGABYTE RTX 2080 Ti WindForce	1350 MHz	1545 MHz	1750 MHz	280 mm/11 inches
GIGABYTE RTX 2080 Ti WindForce OC	1350 MHz	1620 MHz	1750 MHz	280 mm/11 inches
HP RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	
Inno3D iChill RTX 2080 Ti Black	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches
Inno3D iChill RTX 2080 Ti Frostbite	1350 MHz	1695 MHz	1750 MHz	265 mm/10.4 inches
Inno3D iChill RTX 2080 Ti X3 JEKYL	1350 MHz	1545 MHz	1750 MHz	300 mm/11.8 inches
Inno3D RTX 2080 Ti X2 Gaming OC	1350 MHz	1590 MHz	1750 MHz	268 mm/10.6 inches
Inno3D RTX 2080 Ti X3 Gaming OC	1350 MHz	1665 MHz	1750 MHz	272 mm/10.7 inches
KFA2 RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	
KFA2 RTX 2080 Ti Dual Black	1350 MHz	1545 MHz	1750 MHz	

▼ Name	GPU Clock	Boost Clock	Memory Clock	Other Changes
KFA2 RTX 2080 Ti HOF	1350 MHz	1755 MHz	1750 MHz	330 mm/13 inches
KFA2 RTX 2080 Ti OC	1350 MHz	1620 MHz	1750 MHz	
KFA2 RTX 2080 Ti OC White	1350 MHz	1620 MHz	1750 MHz	
KFA2 RTX 2080 Ti SG Edition	1350 MHz	1545 MHz	1750 MHz	308 mm/12.1 inches
KUROUTOSHIKOU RTX 2080 Ti WHITE	1350 MHz	1635 MHz	1750 MHz	
Leadtek WinFast RTX 2080 Ti	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches
Leadtek WinFast RTX 2080 Ti Hurricane	1350 MHz	1635 MHz	1750 MHz	303 mm/11.9 inches
Manli RTX 2080 Ti Blower	1350 MHz	1545 MHz	1750 MHz	
Manli RTX 2080 Ti Gallardo	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches
Manli RTX 2080 Ti Gallardo Custom LED	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches, Triple-slot
MAXSUN RTX 2080 Ti Wind OC	1350 MHz	1650 MHz	1750 MHz	292 mm/11.5 inches
MAXSUN RTX 2080 Ti Wind OC V2	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches
MSI RTX 2080 Ti DUKE	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches, Triple-slot
MSI RTX 2080 Ti DUKE OC	 1350 MHz	1665 MHz	1750 MHz	314 mm/12.4 inches, Triple-slot
MSI RTX 2080 Ti GAMING TRIO	1350 MHz	1635 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti GAMING X TRIO	 1350 MHz	1755 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti GAMING Z TRIO	1350 MHz	1755 MHz	2000 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti Lightning	1350 MHz	1575 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti Lightning 10th Anniversary	1350 MHz	1545 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti Lightning Z	 1350 MHz	1770 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti Lightning Z Pink Edition	1350 MHz	1770 MHz	1750 MHz	328 mm/12.9 inches, Triple-slot
MSI RTX 2080 Ti Sea Hawk EK X	1350 MHz	1755 MHz	1750 MHz	305 mm/12 inches
MSI RTX 2080 Ti Sea Hawk X	1350 MHz	1755 MHz	1750 MHz	268 mm/10.6 inches
MSI RTX 2080 Ti VENTUS	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot
MSI RTX 2080 Ti VENTUS GP	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot
MSI RTX 2080 Ti VENTUS OC	1350 MHz	1635 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot
MSI RTX 2080 Ti VENTUS OCV1	1350 MHz	1575 MHz	1750 MHz	268 mm/10.6 inches, Triple-slot
NVIDIA GeForce RTX 2080 Ti Cyberpunk 2077	1350 MHz	1635 MHz	1750 MHz	

▼ Name	GPU Clock	Boost Clock	Memory Clock	Other Changes
NVIDIA GeForce RTX 2080 Ti Founders Edition 	1350 MHz	1635 MHz	1750 MHz	
Palit RTX 2080 Ti Dual	1350 MHz	1545 MHz	1750 MHz	292 mm/11.5 inches, Triple-slot
Palit RTX 2080 Ti GamingPro	1350 MHz	1575 MHz	1750 MHz	292 mm/11.5 inches, Triple-slot
Palit RTX 2080 Ti GamingPro OC	1350 MHz	1650 MHz	1750 MHz	292 mm/11.5 inches, Triple-slot
PNY RTX 2080 Ti Blower	1350 MHz	1545 MHz	1750 MHz	
PNY RTX 2080 Ti Blower	1350 MHz	1545 MHz	1750 MHz	
PNY XLR8 RTX 2080 Ti Gaming OC	1350 MHz	1635 MHz	1750 MHz	314 mm/12.4 inches
Yeston RTX 2080 Ti Deluxe Edition	1350 MHz	1635 MHz	1750 MHz	312 mm/12.3 inches
ZOTAC RTX 2080 Ti AI OC HA	1350 MHz	1560 MHz	1750 MHz	
ZOTAC RTX 2080 Ti AMP 	1350 MHz	1665 MHz	1750 MHz	308 mm/12.1 inches, Triple-slot
ZOTAC RTX 2080 Ti AMP Extreme	1350 MHz	1815 MHz	1800 MHz	324 mm/12.8 inches, Triple-slot
ZOTAC RTX 2080 Ti AMP Extreme Core	1350 MHz	1755 MHz	1800 MHz	324 mm/12.8 inches, Triple-slot
ZOTAC RTX 2080 Ti AMP Extreme T4C Edition	1350 MHz	1815 MHz	1800 MHz	324 mm/12.8 inches, Triple-slot
ZOTAC RTX 2080 Ti AMP MAXX	1350 MHz	1665 MHz	1750 MHz	298 mm/11.7 inches
ZOTAC RTX 2080 Ti ArcticStorm	1350 MHz	1575 MHz	1750 MHz	295 mm/11.6 inches
ZOTAC RTX 2080 Ti Blower	1350 MHz	1545 MHz	1750 MHz	268 mm/10.6 inches
ZOTAC RTX 2080 Ti Extreme Plus OC	1350 MHz	1575 MHz	1750 MHz	316 mm/12.4 inches, Triple-slot

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