MAKLUMAT SPESIFIKASI ITEM

www.fineprocurementplus.uitm.edu.my

UNIVERSITI TEKNOLOGI MARA

MAKLUMAT SPESIFIKASI ITEM

No Pelawaan	:	UiTM/B1/PER/SHR/B/0525/0021
Butiran Tawaran	:	Cadangan Membekal, Menghantar, Memasang, Mengujilari Dan Menyelenggara Peralatan Pengajaran dan
Keterangan Item	:	0609060100036 : Oscilloscope
Nama Spesifikasi	:	PKE 2025 Semikonduktor : 4 Channel Digital Storage Oscilloscopes
Kuantiti	:	10.000

Butiran Keperluan	**Calit**	**Tawaran Syarikat**
1 GENERAL REQUIREMENTS		
I Vendors must comply with all the requirements specified in this tender document	☐	
II Vendors must bear all costs of supplying the specified quantity of items to UiTM. Such costs shall include the costs of delivery, installation, commissioning, training, troubleshoot and maintenance work (including parts labour and on-site service) within the specified warranty period	☐	
2 SPECIFICATION		
I TECHNICAL SPECIFICATIONS		
A)	☐	
• Channel: 4 Channels		
B)	☐	
• Bandwidth: 70 MHZ(base bandwidth) upgrade to 100 MHz		

Butiran Keperluan	Calit	Tawaran Syarikat
C) Sample rate per channel (max): 2 GSa/s (one- or half-channel operation). 1 GSa/s (three- or four-channel operation)	☐	
D) Memory depth per channel (max): 2M points (one- or half-channel operation). 1 M points (three- or four-channel operation)	☐	
E) Comes with software that enables the PC control to get access the result fasters with simple clicks.	☐	
F) Waveform update rate: 200,000 waveforms per second	☐	
G) Calculated rise time (10% to 90%): ≤1.7ns	☐	
H) Waveform math: Add, subtract, multiply, divide, FFT (magnitude and phase), low pass filter	☐	
I) Automatic measurements:14 amplitude, 14 timing, and 4 pulse count measurements	☐	
J) Display: 7-inch TFTLCD WVGA	☐	
K) Connectivity: One USB 2.0 hi-speed device port on rear panel (Supports USBTMC protocol), One USB 2.0 hi-speed host port on front panel (Supports memory devices) & One Ethernet 10/100 Base-T port on rear panel	☐	
L) Standard passive probes: 4 probes included	☐	
M) Power voltage range: 100to 120 V, 50/60/400 Hz; 100 to 240V, 50/60 Hz	☐	
N) Safety: ANSI/UL Std. No.61010-1:2012;CAN/CSA-C22.2 No. 61010-1-12 & ANSI/UL Std. No. 61010-2-030:2012; CAN/CSA-C22.2 No. 61010-2-030-12	☐	
O) Environmental rating: 0 to +50 °C, 3,000 m Max, Maximum Relative Humidity (non-condensing): 95%RH up to 40°C, decreases linearly to 45%RH at 50°C 11	☐	
P) **Acquisition System**		
II **Vertical System**		
A)	☐	

- Input coupling: DC, AC (10 Hz cutoff frequency)
- Input impedance/capacitance: 1 MΩ ± 2%, 16 pF ±3 pF
- Input sensitivity: range: 500 µV/div to 10 V/div
- Standard probes: N2140A 1/10 switchable 200 MHz
- Probe attenuation factor: 0.1X to 10,000X in 1-2-5 sequence; (–20 dB to +80 dB in 0.1 dB steps)
- Hardware bandwidth limits: Approximately 20 MHz (selectable)
- Vertical resolution: 8 bits
- Invert signal: Selectable
- Maximum input voltage:150 Vrms, 200 Vpk
- DC vertical accuracy: ± [DC vertical gain accuracy + DC vertical offset accuracy + 0.25% full scale]
- DC vertical gain accuracy: 1 +3% full scale (≥ 10 mV/div), +4% full scale (10 mV/div)
- DC vertical offset accuracy: ± 0.1 div ± 2 mV ± 1% of offset setting
- Skew: Channel to channel: 1 ns (without deskew), Channel to external: 2 ns (without deskew)
- Offset range: 500 uV/div to 200 mV/div: +2 V, > 200 mV/div to 10 V/div: +100 V

III **Horizontal System**

A) ☐

- Time base range: 2 ns/div to 50 s/div
- Horizontal resolution: 2.5 ps
- Timebase accuracy: 50 ppm ± 5 ppm per year (aging)
- Timebase delay time range: Pre-trigger: Greater of 1 screen width or 200 µs
- Post-trigger: 1 to 500 s
- Channel to channel deskew range: ± 100 ns
- Δ Time accuracy (using cursors): ± (time base acc. x reading) ± (0.0016 x screen width) ± 200 ps (same channel)
- Mode: Main, zoom, roll, XY
- XY: X = channel 1, Y = channel 2, Z = external trigger, 1.4 V blanking, Bandwidth: Maximum bandwidth. Phase error at 1 MHz: 0.5 degree

IV **Acquisition System**

A) ☐

- Maximum sample rate: 1 GSa/s (4 ch operation)
- Maximum record length: 1 M points (4 ch operation)
- Acquisition mode (Normal): Default mode
- Acquisition mode (Peak Detect): 200 MHz model: 2.5 ns at all time base settings
- Acquisition mode (High Resolution): Real-time boxcar averaging reduces random noise and effectively increases vertical resolution to 12 bits of resolution when ≥ 20 µs/div at 2 GSa/s
- Time mode (Normal): Default mode
- Time mode (Roll): Displays the waveform moving across the screen from right to left. Available at

the timebase settings of 50 ms/div or slower

- Time mode (XY): Displays the volts-versus-volts display , X = Channel 1, Y = Channel 2, Z = External trigger, 1.4 V blanking,
- Autoscale: Finds and displays all signals connected to analog input channels and the external trigger input. Sets trigger type to rising edge at ~50% on external (highest priority source), or lowest numbered channel with a signal that exceeds ~10 mVpp. Optimizes vertical scaling for stacked waveforms and sets timebase to display ~ 1.8 periods. Can be customized to function on just channels that are previously turned on and displayed

V **Trigger System**

A) ☐

- Trigger sources: Analog channels, line, external
- Trigger modes: Normal (triggered): Requires trigger event for oscilloscope to trigger
- Trigger modes: Auto(triggered): Triggers on selected source or automatically triggers (asynchronously) in absence of a valid trigger event
- Trigger modes: Single(triggered): Triggers only once upon detection of a valid trigger event
- Trigger modes: Force(triggered) : Front panel button that forces an asynchronous trigger while in the Normal trigger mode
- Trigger coupling:

1. DC: DC coupled trigger
2. AC: AC coupled trigger, cutoff frequency: ~ 10 Hz
3. HF reject: High frequency reject, cutoff frequency ~ 50 kHz
4. LF reject: Low frequency reject, cutoff frequency ~ 50 kHz
5. Noise reject: Selectable OFF or ON, decreases trigger sensitivity 2X

- Trigger holdoff range: 60 ns to 10 s

VI **Trigger Sensitivity**

A) ☐

- Internal: Greater of: 0.6 div or 2.5 mV (≤ 10 MHz), 0.9 div or 3.8 mV (10 to 70 MHz), 1.2 div or 5 mV (70 to 200 MHz)
- External:

1. ≤ 10 MHz: 20 mVpp (1.6 V range) 100 mVpp (8 V range)
2. 10 to 200 MHz: 100 mVpp (1.6 V range) 500 mVpp (8 V range)

VII **Trigger Level Range**

Butiran Keperluan	Calit	Tawaran Syarikat

A)

- Internal: ± 6 div from center-screen
- External: ± 1.6 V or ± 8 V selectable

VIII **Trigger Type Selections**

A)

- Edge: Trigger on a rising, falling, alternating or either edge of any source
- Pattern/State: Trigger when a specified pattern/state on any combination inputs is entered
- Pulse width: Trigger on a pulse of a selected channel with a time duration that is 'less than a value,' 'greater than a value' or 'inside a time range' Range minimum: 10 ns, 10 s max
- Setup and hold: Trigger and clock/data setup and/or hold time violation. Setup time can be set from –7 ns to 10 s. Hold time can be set from 0 s to 10 ns
- Rise/fall time: Trigger and clock/data setup and/or hold time violation. Setup time can be set from –7 ns to 10 s. Hold time can be set from 0 s to 10 ns
- Video: Trigger on all lines or individual lines; odd/even or all fields from the composite video; or broadcast standards (NTSC, PAL, SECAM, and PAM-M)
- I2C: Trigger at a start/stop condition or user-defined frame with address and/or data values. Also, trigger on missing acknowledge, restart, EEPROM read and 10-bit write
- RS-232/422/485/UART: Trigger on Rx or Tx start bit, stop bit, data content or parity error

IX **Waveform measurements**

A)

- Select up to 4 continuously updated measurements from a list of 32 available amplitude, timing, and count measurements
- Cursors track last selected measurement
- Use default (relative/%) or customizable measurement threshold levels (absolute or relative)
- Measurements automatically gated by zoom window
- Vertical/amplitude measurements (14): Peak-to-peak, maximum, minimum, amplitude, top, base, overshoot, preshoot, average-N cycles, average-full screen, DC RMS-N cycles, DC RMS-full screen, AC RMS-N cycles, AC RMS-full screen (standard deviation)
- Timing measurements (14): Period, frequency, counter, +width, -width, +duty cycle, -duty cycle, bit rate, rise time, fall time, delay, phase, X at min Y, X at max Y
- Count measurements (4): +pulse count, -pulse count, rising edge count, falling edge count
- Snapshot: Performs 24 parametric measurements once (not updated) on a single source (ch1, ch2) (ch3, or ch4 is note relayed since proposed 2 channel model) one time

X **Digital Voltmeter**

Butiran Keperluan	Calit	Tawaran Syarikat

A)

- Functions: DC, AC-rms, DC-rms
- Resolution: 3 digits
- Measuring rate: 100 times/second
- Auto ranging: Automatic adjustment of vertical amplification to maximize the dynamic range of measurements
- Range meter: Graphical display of most recent measurement, plus extreme over the previous 3 seconds

XI **Frequency Counter**

A)

- Functions: Frequency
- Resolution: 5 digits
- Measuring rate: 100 times/second
- Auto ranging: Automatic adjustment of vertical amplification to maximize the dynamic range of measurements
- Range meter: Graphical display of most recent measurement, plus extrema over the previous 3 seconds

XII **Connectivity**

A)

- Standard Ports:

1. One USB 2.0 hi-speed device port on rear panel. Supports USBTMC protocol
2. One USB 2.0 hi-speed host port on front panel. Supports memory devices
3. One Ethernet 10/100Base-T port on rear panel

XIII **Nonvolatile storage**

A)

- Reference waveform display: Two internal waveforms or USB thumb drive
- Waveform/data storage: Setups (.scp), images (.bmp, .png), channel waveforms (.csv, .bin), reference waveforms (.h5), mask (.msk), serial protocol data (.csv), Bode gain & phase data (.csv)
- Max USB flash drive size: Supports industry standard flash drives
- Setups without USB flash drive: 10 internal setups
- USB drive format: FAT32 , NTFS, EXT2/3/4

Butiran Keperluan	Calit	Tawaran Syarikat
XIV **Supplied Accessories**		
A) • Standard four passive probes as a set • Standard secure erase • Built-in with 13 languages • Localized power cord • Minimum with 3 years warranty	☐	
3 CATALOGUES / BROCHURES		
I Vendors must provide the catalogues / brochures / technical specification manuals with the tender proposal	☐	
II Original copies of user and operational manual of the equipment must be provided	☐	
4 TRAINING		
I Tenderers are required to provide training for the use, maintenance and troubleshoot of the equipment to the Technical Staff & Lecture of Electrical Engineering School, College of Engineering, UiTM Shah Alam and all training-related costs are borne by the tenderers.	☐	
II A minimum of One (1) days training for a minimum of ten (10) participants covering each module. (Vendors must provide details/syllabus of the training module)	☐	
III Complete training materials and documentation must be provided to all participants	☐	
IV The training MUST be conducted by trainers who are certified by principal	☐	
5 WARRANTY AND SUPPORT		
I Vendors must have local service for repair services and provide on call services when required by UiTM	☐	
II Vendors must provide details of warranty. INCLUDING ALL parts, labour, basic phone support for hardware issue, repairs onsite)	☐	
III Vendors be responsible for the installation, commissioning and test-run of the equipment and accompanying software (if applicable) to the satisfaction of UNIVERSITI TEKNOLOGI MARA before final acceptance.	☐	

Butiran Keperluan		Calit	Tawaran Syarikat
III			
IV	All cost on delivery. installation, commissioning and test run shall be borne by the vendor.	☐	
V	Vendors must be supported back-to-back by principals manufacturer) to provide maintenance services for equipment	☐	
VI	Free support through fax, email, telephone must be provided during the warranty period	☐	
6	OTHER REQUIREMENTS		
I	Note that all other related material, components and cabling, which are required to ensure full operation of the above package must be supplied and borne by vendors	☐	