MAKLUMAT SPESIFIKASI ITEM

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No Pelawaan	:	UiTM/B1/PER/SHR/B/0625/0038
Butiran Tawaran	:	Cadangan Membekal, Menghantar, Memasang, Mengujilari Dan Menyelenggara Peralatan Pengajaran dan
Keterangan Item	:	0609030200017 : Arbitrary Waveform Generator
Nama Spesifikasi	:	FKE (V3) 2025 Dual Channel Waveform Generator
Kuantiti	:	15.000

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 GENERAL SPECIFICATION :		
I General Overview : - Type : Dual Channel Function / Arbitrary Waveform Generator - Max Output Frequency the same or more than 20 MHz - Resolution : 14-bit, 1 mHz frequency resolution - Sample Rate (Arb) : Up to 250 MSa/s - Waveform Memory : 16 kpts per channel	☐	
II Output Channels : - 2 Independent Channels - Each channel supports the same performance and capabilities	☐	

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III Standard Waveforms :
   - Sine
   - Square
   - Ramp / Triangle
   - Pulse
   - Gaussian Noise
   - DC
   - Pseudorandom Binary Sequence (PRBS)

IV Modulation Types :

   • Amplitude modulation (AM)
   • frequency modulation (FM)
   • phase modulation (PM)
   • frequency shift keying (FSK)
   • binary phase shift keying (BPSK)
   • pulse width modulation (PWM)

V Operating modes : Independent, coupled parameter(s), combined (Channels 1 and 2); equal (Channel 1 = Channel 2) or differential (Ch 1 = -Ch 2)

VI Relative phase : 0° to 360°, 0.1° resolution

VII Parameter coupling : None, frequency (ratio or difference) and / or amplitude and DC offset

VIII Channel-to-channel skew (typical) ; both channels configured identically and Crosstalk: 0.8 ns | -75 Db

IX Sync out/trigger out :
   Connector : Front BNC, chassis-referenced; functions as an output
   Minimum output high voltage : Minimum 1.3 V
   Maximum output low voltage : Maximum 0.1V

X Waveform :

   A) General :
   - Connector : Front-panel BNC, shell connected to chassis; all inputs and output BNC connectors are chassis referenced
   - Function will On, Off or Inverted

   B) Sine :
   - Frequency Range include the resolution : 1uHz to 20 MHz
   - Amplitude Flatness : 1 Vpp = Vout = 10 Vpp (50 Ohm load) fOUT = 100 KHz: ±0.1 dB 100 KHz fOUT = 5 MHz: ±0.15 dB 5 MHz fOUT = 20 MHz: ±0.3 dB

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C) Square and Pulse : - Frequency Range include the resolution: 1uHz to 10 MHz - Pulse Width: 16ns minimum with adjustable with 100px resolution	☐	
D) Ramp and Triangle : - Frequency Range include the resolution: 1uHz to 200 kHz - Llinearity: ≤ 0.1% from 5% to 95% of the signal amplitude (Vout ≥ 1 Vpp)	☐	
E) Gaussian Noise : - Variable bandwidth is 1 MHz to 20 MHz - Crest factor: 4.6 - Repetition period: >50 years	☐	
F) Pseudorandom Binary Sequence (PRBS) : - Bit rate: 1 Mbps to 50 Mbps, 1 Mbps resolution - Sequence length: 2 m - 1, m = 7, 9, 11, 15, 20, 23 - Rise and fall times: 8.4 ns to 1 µS, independently variable, 100 ps resolution	☐	
G) Arbitrary Waveforms : - Waveform length: 8 Sa to 8 MSa per channel (maximum up to 1 MSa per waveform) - Sample rate: 1 µSa/s to 250 MSa/s, 1 µSa/s resolution - Voltage resolution: 16 bits	☐	
H) Amplitude : - Range: 1 mVpp to 10 Vpp into 50 ?, 4-digit resolution | 2 mVpp to 20 Vpp into open circuit, 4-digit resolution - Accuracy at 1 kHz sine: ± (2% of setting in Vpp) ± (1 mVpp)	☐	
I) DC Offset : - Range : ± (5 VDC minus peak AC) into 50 ?, 4-digit resolution | ± (10 VDC minus peak AC) into open circuit, 4-digit resolution - Accuracy : ± (1% of offset setting) ± (1% of amplitude in Vpp) ± (5 mV)	☐	
J) Frequency Accuracy : ± (1 ppm of setting + 15 pHz), 1 year, 23 ºC ± 5 ºC | ± (2 ppm of setting + 15 pHz), 1 year, 0 ºC to 55 ºC	☐	
XI Display : - 7-inch WVGA Display or better - Displays waveforms, settings, simultaneous parameter set up, signal viewing and editing and channel status	☐	
XII Connectivity : - USB 2.0 Device (for remote control and firmware updates) or better - LAN (Ethernet) - SCPI Commands supported for remote programming	☐	
XIII Protection : - Over-voltage protection on output - Short-circuit protection	☐	

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XIV Power Supply :
- 100 to 240 VAC ±10%
- 50/60 Hz

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XV Power cord : UK Plug

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3 CATALOGUES / BROCHURES :

I Vendors must provide the catalogues / brochures / technical specification manuals with the tender proposal.

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II Original copies catalogue of user, brochure, operational manual and clear technical specification of the equipment must be provided

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III Please include a drawing illustrating connection between the components. (if relevant)

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IV The equipment must be supplied with latest programming software and compatible to operate via latest Windows operating system. (if relevant)

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V The equipment offered by vendor must be of the latest available model.

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4 TRAINING :

I Tenderers are required to provide training for the use, maintenance and troubleshoot of the equipment to the Technical Staff & Lecturer of Faculty Electrical Engineering, UiTM Shah Alam and all training-related costs are borne by the tenderers.

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II A minimum of one (1) days training for a minimum of five (5) participants covering each module. (Vendors must provide details/syllabus of the training module)

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III Complete training materials and documentation must be provided to all participants

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IV The training MUST be conducted by trainers who are certified by principal. Please attach the trainer's certification that is certified by principal supplier.

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5 WARRANTY AND SUPPORT :

I Installation, maintanance, testing and commissioning of the entire system should be completed within (12) week from the delivery date.

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Butiran Keperluan	**Calit**	**Tawaran Syarikat**
II Vendors must have local service for repair services and provide on call services when required by UiTM	☐	
III Vendors must provide details of warranty. INCLUDING ALL parts, labour, basic phone support for hardware issue, repairs onsite) Please attach the Letter of Warranty (LOW) from the principle, which states that UiTM is entitled to 3 years of warranty upon project completion	☐	
IV 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.	☐	
V All cost on delivery. installation, commissioning and test run shall be borne by the vendor.	☐	
VI The vendors MUST provide a genuine product. The vendors must be supported back-to-back by a principle (manufacturer) to provide maintenance services for equipment supplied. The vendors should attach a Letter of Authorization (LOA) from Distributors/ Principal.	☐	
VII Free support through fax, email, telephone must be provided during the warranty period	☐	

6   OTHER REQUIREMENTS :

	Calit	**Tawaran Syarikat**
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	☐	