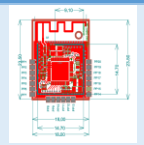
Hue Engine 9290024695

Specification item	Value	Unit	Condition
Description 			Hue Engine is second generation of a general purpose Zigbee& BLE certified building block for Hue connected lighting applications e.g. Hue White, Hue White Ambiance and Hue White and Color ambiance for lamps and luminaires.
Logistical data			
12NC	929002469501		
Minimum Order Quantity	500	PCE	
Electrical input data			
Vcc voltage	3.0~3.6	Volt	Ripple<50 mV
Current (normal)	18	mA	
Electrical output data			
Average power consumption	60mW	Watt	
Standby power	<100mW		
Wiring & Connections 			I/O definition
Ground	1	GND	
ADC2, e.g. for voltage sensing General purpose in/out 2	2	ADC2	
ADC1, e.g. for current sensing	3	ADC1	
to be used as ADC (e.g. NTC read-out), I2C, SPI or PWM	4	Mixed_out_1	
to be used as ADC, I2C, SPI or PWM PWM_CHN1	5	Mixed_out_2	
General purpose in/out 1: E.g. for button control	6	GPIO1	
General purpose in/out 2: E.g. for button controlPWM CHN3	7	GPIO2	
i.e. for current source	8	Enable	
PWM output	9	PWM_CH0	
PWM output	10	PWM_CH1	
PWM output	11	PWM_CH2	
PWM output	12	PWM_CH3	
PWM output	13	PWM_CH4	
Ground	14	GND	
3V power in	15	VDD	
Used for SW programming, UART bus communication	16	TXD	
Used for SW programming, UART bus communication	17	RXD	
Used for SW debugging	18	Nreset	
Used for SW debugging	19	SWCLK	
Used for SW debugging	20	SWDIO	
Features & Functions			
Hue White Color Ambience	yes		
Hue White Ambiance	yes		
Hue White	yes		
Dimming	yes		
Device diversity	yes		by late state configuration
Automatic color consistency	yes		
OTA upgrade	yes		Over the air upgradable when connected to the Hue Bridge
Wireless specifications			
Wireless RF mode frequency band	2400 - 2483.5 MHz	MHz	
Wireless communications protocol	IEEE 802.15.4 Bluetooth LE	ZigBee protocol Bluetooth LE protocol	
Operating channel	Zigbee 11 - 26 Bluetooth 0-39	channels	
Range	12	meter	indoor
Frequency tolerances (Typical)	+/-40	ppm	Continuous single tone
Output power (Typical)	9	dBM	Measured at antenna feedpoint
EVM (Typical)	18	%rms	
Receiver Sensitivity (Typical)	-102	dBM	conducted sensitivity
TRP	6	dBM	when mounted on a motherboard of 30x40mm (i.e. Hue Connect)
LED board requirements			
Hue White Color Ambience	Unified Gamut Tunable white CCT range: 2000-6500K		covered by L1.5 specifications

			covered by L1.5 specifications
Hue White Ambiance	Tunable white CCT range: 2000-6500K		
			covered by L1.5 specifications
Hue White	2700K / 3000K / 4000K		
			covered by L1.5 specifications
Insulations			
Dimensions & Weight			
Length	23.5	mm	±10% tolerance
Width	18	mm	±10% tolerance
Height	3.5	mm	±10% tolerance
Fixing hole diameter	NA	mm	
Fixing hole distance	NA	mm	
Weight		gram	
Operational temperatures and humidity			
Ambient temperature	-20 - 75° C	Celcius	
Tcase-max		Celcius	to be measured on Hue Engine shield
Maximum housing temperature			
Relative humidity			Non-condensing
Enviroment	Damp		
Storage temperature and humidity			
Ambient temperature			For 6 months
Relative humidity			Non-condensing
Lifetime			
lifetime		hours	Measured temperature at Tc-point is Tcase- max. Maximum failures = 10%
Surge capability			
ESD rating	+/-2	KV	Contact
	+/-4	KV	Air
Certificates and standards			
Approval marks	CE, FCC, RED, ROHS & REACH, Zigbee, BLE		
Compliances and approvals			

FCC	FCC Labelling Requirements When integrating HUE Engine into a product it must be ensured that the FCC labelling requirements are met. This includes a clearly visible label on the outside of the finished product specifying the FCC identifier (FCC ID: 2AGBW9290024695X). This exterior label can use wording such as “Contains Transmitter Module FCC ID: 2AGBW9290024695X” although any similar wording that expresses the same meaning may be used. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment. The advance interface module complies with FCC radiation exposure limits set forth for an uncontrolled environment. The module and associated antenna must be installed to provide a separation distance of at least 20cm from all persons and must not transmit simultaneously with any other antenna or transmitter. and it needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application). FCC Approvals FCC statement: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
	FCC notice: This device is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification and the final host product still requires Part 15 Subpart B compliance testing with the modular. This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna Increase the separation between the device and receiver Connect the device into an outlet on a circuit different from that to which the receiver is connected Consult the dealer or an experienced radio/television technician for help . Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

IC	IC (ISED Canada) Approvals This device complies with ISED Canadalicense-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Under ISED Canadaregulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication This module complies with ISED CanadaRF radiation exposure limits set forth for general population. To maintain compliance, this module must not be co-located or operating in conjunction with any other antenna or transmitter. The module and associated antenna must be installed to provide a separation distance of at least 20 cm from all persons and must not transmit simultaneously with any other antenna or transmitter. Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each. Class B Notice for Canada This Class B digital apparatus complies with Canadian ICES-003. The labelling requirements for ISED Canadaare similar to those of the FCC. Again a clearly visibly label must be placed on the outside of the finished product stating something like “Contains Transmitter Module, IC: 20812-24695X”, although any similar wording that expresses the same meaning may be used.
	Le présent appareil est conforme aux CNR d’ lndustrie Canada applicables aux appareils radio exempts de licence. L’ exploitation est autorisée aux deux conditions suivantes: (1) I’ appareil ne doit pas produire de brouillage, et (2)I’ utilisateur de I’ appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’ en compromettre le fonctionnement. En vertu de la réglementation d’ Industrie Canada, cet émetteur radio risquera uniquement à l’ aide d’ une antenne de type et de gain maximum (ou moins) pour l’ émetteur a approuvé par Industrie Canada. Pour réduire les interférences radio potentielles à d’ autres utilisateurs, le type d’ antenne et son gain doivent être choisies que la puissance isotrope rayonnée équivalente (p.i.r.e.) n’ est pas plus que celle autorisée pour une communication r éussie Cet émetteur ne doit pas tre Co-placé ou ne fonctionnant en même temps qu’aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps. Ce module est conforme à la FCC et Industrie Canada RF limites d’ exposition aux rayonnements définies pour l’ ensemble de la population. Pour maintenir la conformité, ce module ne doit pas être co-implanté ou fonctionner en conjonction avec toute autre antenne ou émetteur À la suite de l’ avis ci-dessus, le fabricant doit fournir une liste de tous les types d’ antenne approuvés pour une utilisation avec l’ émetteur, indiquant au maximum gain d’ antenne (en dBi) et impédance requise pour chacun.

	Les exigences d’ étiquetage pour Industrie Canada sont semblables à celles de la FCC. Encore une fois un clairement visiblement étiquette doit être placée à l’ extérieur du produit fini indiquant quelque chose comme ″Module émetteur de Contains, IC ID: 20812-24695X″, bien que tout même libellé qui exprime que le même sens peuvent être utilisé. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada
CE	European Certification (ETSI) The module have been certified to the following standards: • Radio: EN 300 328 • EMC: EN 301 489-1, EN 301 489-17 • EMF: EN 62479 • Safety: EN 61347-1, EN 61347-2-11 If the module is incorporated into an OEM product, the OEM product manufacturer must ensure compliance of the final product to the European Harmonized EMC, and low voltage/safety standards