MT30
(3.3V High Performance Barcode Scan Engine)

Integration Guide
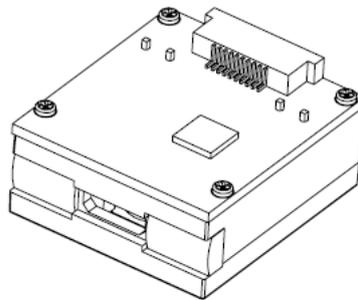
TABLE OF CONTENTS

1. INTRODUCTION

The MT30 Linear Image Barcode Scan Engine is designed for 1D high performance barcode scanning with optimal performance and easy integration. MT30 is ideal for integration into data terminals and other small mobile devices.

The MT30 consists of 2 illumination LEDs, a high-quality linear image sensor and a microprocessor that contains powerful firmware to control all aspects of operations and enable communication with the host system over the standard set of communication interfaces.

Two interfaces, UART & USB, are available. UART interface communicates with the host system over TTL-level RS232 communication; USB interface emulates a USB Keyboard device and communicates with the host system over USB.

1-1. MT30 Block Diagram
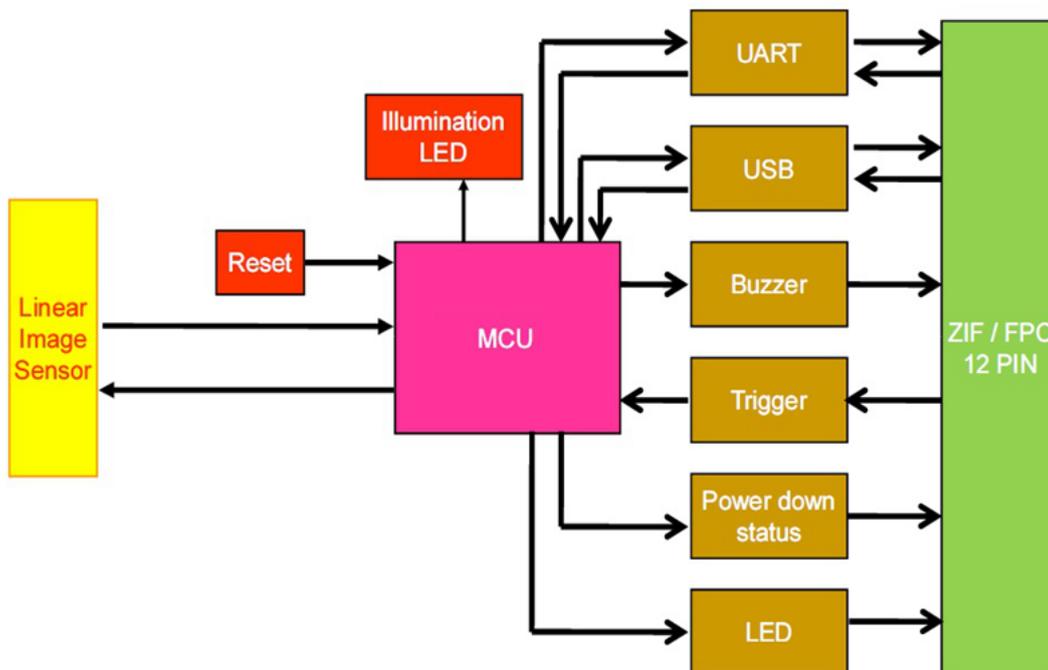
1-2. Electric Interface

1-2-1. Pin Assignment

(Top View of MT30)

Pin1   Pin12

VCC

RXD
Trigger
Power_enable
TXD
RTS

USB_D+
LED
CTS
BZ
USB_D-

1
2
3
4
5
6
7
8
9
10
11
12

Pin#	UART	USB	I/O	Description	Schematic Example
1	VCC	VCC	------------	Supply voltage input. Must always be connected to 3.3 power supply.	+3V3
2	RXD	------------	Input	UART TTL data input.	**RS232 IC** TXD 11 T1I R1O 14 RS232-TXD; RTS 10 T2I R2O 7 RS232-RTS; RXD 12 T1O R1I 13 RS232-RXD; CTS 9 T2O R2I 8 RS232-CTS Sipex® Vendor P/N: SP232ACT
3	Trigger	Trigger	Input	High: Power-up/Standby Low: Scanning Operation *Warning:* 1. *Pull low at power-up will prompt the scan engine into firmware update mode.*	3.3V/5V ... 0V/gnd ... Active Low Once trigger is pressed (pull low), scanning operation continues until a barcode is successfully decoded or the trigger is released (pull high). To proceed to the next scanning operation, release (pull high) first and press (pull low) the trigger again.
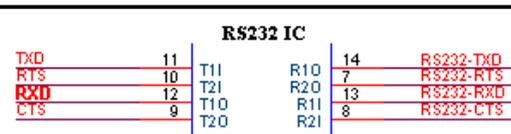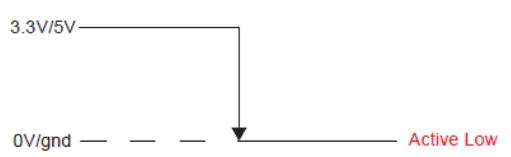
Pin#	UART	USB	I/O	Description	Schematic Example
4	Power Enable	Power Enable	Input	High: Scan Engine Off Low: Scan Engine On *Except:* *1. During data transmission* *2. Writing parameters to non-volatile memory.*	3.3V/5V --- --- --- Active High 0V/gnd When Power Enable pin is pull high, scan engine will be shut down with power consumption of less than 1uA.
5	TXD	------------	Output	UART TTL data output.	RS232 IC TXD 11 T1I R1O 14 RS232-TXD RTS 10 T2I R2O 7 RS232-RTS RXD 12 T1O R1I 13 RS232-RXD CTS 9 T2O R2I 8 RS232-CTS Sipex® Vendor P/N: SP232ACT
6	RTS	------------	Output	When handshaking is enabled, MT30 requests permission from host to transmit data on TXD line.	RS232 IC TXD 11 T1I R1O 14 RS232-TXD RTS 10 T2I R2O 7 RS232-RTS RXD 12 T1O R1I 13 RS232-RXD CTS 9 T2O R2I 8 RS232-CTS Sipex® Vendor P/N: SP232ACT
7	GND	GND	------------	Power and signal ground.	
8	------------	USB D+	Bidirectional	Differential Signal Transmission	USB_Port VIN_5V 1 5 USB_D- 2 USB_D+ 3 GND 4 6 GND
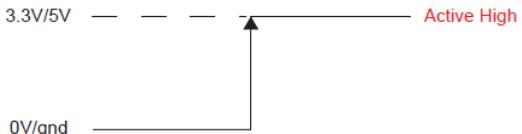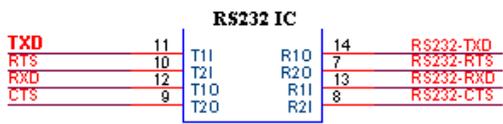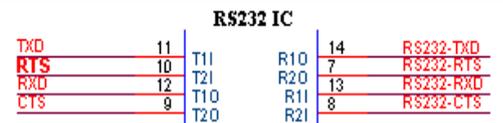
Pin#	UART	USB	I/O	Description	Schematic Example
9	LED	LED	Output	Active high, it indicates the status of Power-Up or a successful barcode decoded (Good Read).	VCC, LED1 GREEN, R11 330R, Q4 2N3904, Decode LED, R13 4K7
10	CTS	------------	Input	When handshaking is enabled, host authorizes MT30 to transmit data on TXD line.	RS232 IC — TXD 11, RTS 10, RXD 12, CTS 9, T1I, T2I, T1O, T2O, R1O 14, R2O 7, R1I 13, R2I 8, RS232-TXD, RS232-RTS, RS232-RXD, RS232-CTS. Sipex® Vendor P/N: SP232ACT
11	Buzzer	Buzzer	Output	Active high: Power-Up or a successful barcode decoded. PWM controlled signal can be used to drive an external buzzer for a successful barcode decoded (Good Read).	VCC, R3 10R, HD1 1N 4148, BZ1 BZ_2.7K, C8 10uF, Buzzer, R6 2K7, Q1 2N3904, R7 6K8, Q2 2N3904, R8 3K3
12	------------	USB D-	Bidirectional	Differential Signal Transmission	USB_Port, VIN_5V 1, USB_D- 2, USB_D+ 3, GND 4, 5, 6, GND
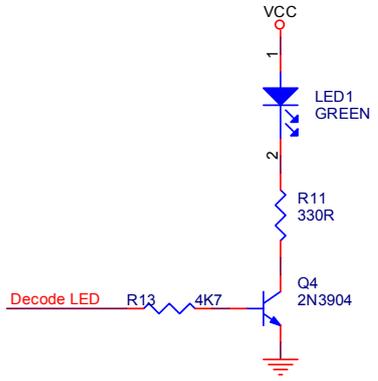
1-2-2. Electric Characteristics

Symbol	Ratings	Min	Max	Unit
V_{IH}	Input high level	$0.41*(V_{DD}-2)+1.3$	$V_{DD}+0.3$	V
V_{IL}	Input low level	0	$0.28*(V_{DD}-2)+0.8$	V
V_{OH}	Output high level	$V_{DD}-0.4$	-	V
V_{OL}	Output low level	-	0.4	V
$V_{ESD(HBM)}$	Electrostatic discharge voltage (human body model)	±4kV contact direct discharge, ±8kV indirect discharge. Requires housing that is designed for ESD protection and stray electric fields.		kV

*Note:

1. Power Supply**: V_{DD}**= 3.3 V

2. Exposure to maximum rating conditions for extended periods may affect device reliability.

1-2-3. Flex Cable

The flex cable is used to connect MT30 with the host side. There are 12 pins on both the engine (MT30) side and the host side. Please see Chapter 2-10 for more details of flex cable.

Flex cable (P/N: 67XX-1009X12)	
Pin#	**Pin Assignment To Host**
1	VCC
2	RXD
3	Trigger
4	Power Enable
5	TXD
6	RTS
7	GND
8	USB D+
9	LED
10	CTS
11	Buzzer
12	USB D-
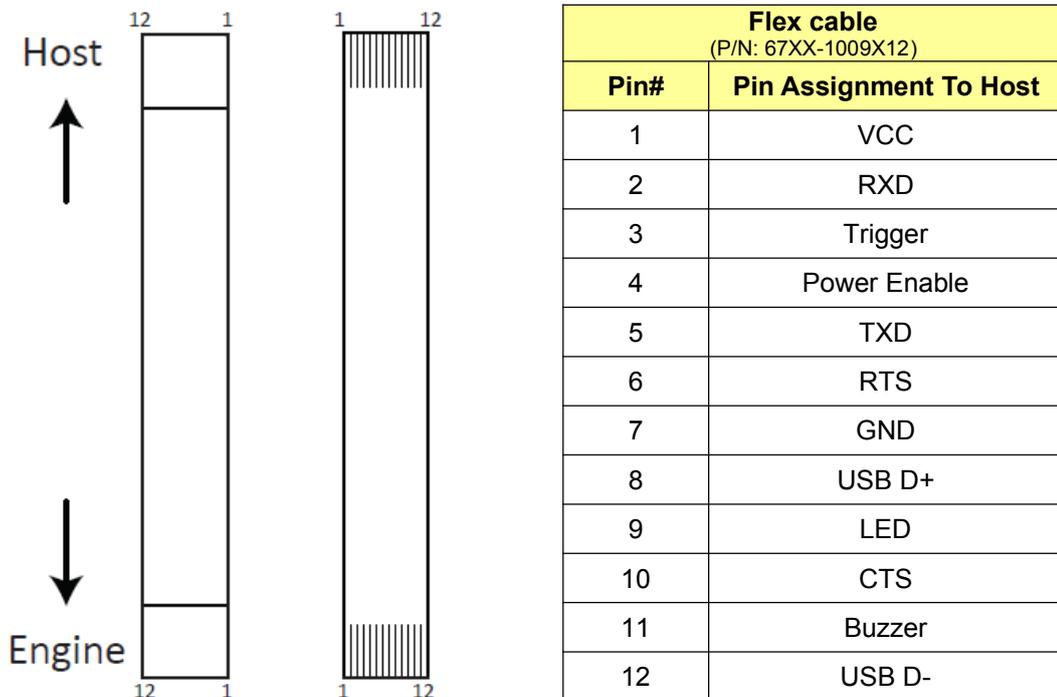
*Note: Conforms to MARSON MT742(L)/MT752(L) pin assignment.

1-3. Operational Timing

This chapter describes the timing associated with the various operating modes of the MT30 including Power Up, Sleep Mode, and Decode Timing.

1-3-1. Power Up

When power is initially applied, the MT30 is activated and begins the process of initialization. Once initialization (duration $\leqq$ 10mS) is completed, the MT30 enters **Standby Mode** and is ready for barcode scanning.

1-3-2. Sleep (Idle) Mode

The MT30 may enter **Sleep (Idle) Mode** after a programmable time period has elapsed without any activity. Please see Chapter 6 for more details about Sleep Mode.

1-3-3. Decode Timing

In **Standby Mode**, the MT30 is activated by the Trigger signal which MUST be kept low for at least 20 ms until the successful scan is achieved, as indicated by the Buzzer/LED signals.

In **Sleep Mode**, the MT30 can be waken up by the Trigger signal which MUST be kept low for at least 2 mS, which will prompt the scan engine into **Standby Mode**.

The total scan and decode time is approximately equal to the time from the Trigger signal going low to the Buzzer/LED signal going high. This time will vary slightly based on several factors including barcode quality, barcode type and the distance between MT30 and the barcode scanned.

Upon a successful scan, the MT30 outputs the Buzzer/LED signal and keeps this signal for the duration of the transmission of the data decoded to the host side. The duration is about 75 ms.

Therefore, the total duration of a typical scanning operation (from Trigger turning low to the end of Buzzer PWM signal) is also approximately 120mS.

1-3-4. Summary of Operation Timings

1. The maximum duration of initialization is 10mS.

2. The maximum duration of scanning operation in Standby Mode is 120mS.

3. The minimum duration of waking up MT30 from Sleep Mode by Trigger signal is about 2 ms.

4. The maximum duration of waking up MT30 from Sleep Mode by Trigger signal and completing decode (when barcode is within optimal focus) is about 120ms

2. SPECIFICATIONS

2-1. Introduction

This chapter provides technical specifications of the MT30 scan engine.

Operating method, scanning range and scan angle are also presented.

2-2. Technical Specifications

Optic & Performance	
Light Source	625nm visible red LED
Sensor	Linear Image Sensor
Scan Rate	400 Scans/ sec (Smart Detection)
Resolution	3mil/ 0.075mm
Scan Angle	41°
Print Contrast Ratio	30%
Width of Field	200mm (13Mil Code39)
Depth Of Field (Environment: 800 lux)	3 Mil Code39: 60 ~ 90mm (4 digits)
	4 Mil Code39: 60 ~ 120mm (4 digits)
	5 Mil Code39: 50 ~ 160mm (4 digits)
	10 Mil Code39: 35 ~ 340mm (4 digits)
	15 Mil Code39: 50 ~ 520mm (4 digits)
	13 Mil UPC/ EAN: 35 ~ 400mm (13 digits)
Physical Characteristics	
Dimension	(W)20.6 x (L)22.5 x (H)11.2 mm
Weight	3.3g
Color	Black
Material	PC
Connector	12pin (pitch = 0.5mm) ZIF
Cable	12pin (pitch = 0.5mm) flex cable
Electrical	
Operation Voltage	3.3VDC ± 5%
Working Current	< 150 mA
Standby Current	< 70 mA
Idle Current	< 6 mA (see **Chapter 6** for Sleep/Idle Mode)
Power Down Current	< 300 uA (see **Chapter 1-2-1** for Power Enable pin)

Surge Current	< 500 mA
Connectivity	
Interface	UART (TTL-level RS232)
	USB (HID Keyboard)
User Environment	
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 60°C
Humidity	0% ~ 95%RH (Non-condensing)
Drop Durability	1.5M
Ambient Light	60,000 Lux (Sunlight)
Symbologies	UPC-A/ UPC-E
	EAN-8/ EAN-13
	Matrix 2 of 5
	China Postal Code (Toshiba Code)
	Industrial 2 of 5
	Interleaved 2 of 5
	Standard 2 of 5 (IATA Code)
	Codabar
	Code 11
	Code 32
	Standard Code 39
	Full ASCII Code 39
	Code 93
	Code 128
	EAN/ UCC 128 (GS1-128)
	MSI/ UK Plessey Code
	Telepen Code
	GS1 Databar
Regulatory	
ESD	Functional after 4KV contact, 8KV air discharge (it requires housing that is designed for ESD protection and stray from electric fields.)
EMC	FCC – Part15 Subpart B (Class B)
	CE – EN55022, EN55024
Safety Approval	IEC 62471 (Exempt Group)
Environmental	WEEE, RoHS 2.0

2-3. Interface

2-3-1. UART Interface

Below default values of communication parameters apply to both Standard mode and Command mode firmware.

Baud rate: 9600

Data Bits: 8

Parity: None

Stop Bit: 1

Handshaking: None

Flow Control Timeout: None

ACK/NAK: OFF

BCC: OFF

A. Standard Mode

Firmware version: SM3-j-x.xx

(MT30 P/N: 1030-A000000)

Characteristics:

(1) Configurable by scanning configuration barcodes or Ez Utility® (a PC-based software utility, available for download at www.marson.com.tw)

(2) Supports hardware trigger only

Interface Configuration Barcode:

. C002$

UART

Scanning above barcode will set your MT30 to UART interface.

B. Command Mode

Firmware version: SM3-j-x.xx.CMD

(MT30 P/N: 1030-A000001)

Characteristics:

(1) Configurable by commands sent from host or

BEO® (a PC-based software utility, available for download at

www.marson.com.tw)

(2) Supports both hardware and software triggers

Interface Configuration Barcode:

Not supported.
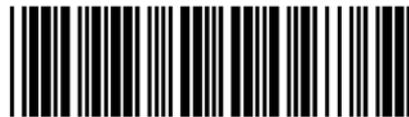
2-3-2. USB Interface

Firmware version: SM3-j-x.xx

(MT30 P/N: 1030-A000000)

Characteristics:

(1) Configurable by scanning configuration barcodes or

Ez Utility® (a PC-based software utility, available for download at

www.marson.com.tw)

(2) Supports hardware trigger only

(3) Emulates a USB Keyboard device

Interface Configuration Barcode:

. C008$

USB HID

Scanning above barcode will set your MT30 to USB interface.

2-4. Operation Method

1. At power-up, the MT30 sends the Power-Up signals over Buzzer and LED pins as an indication that the MT30 enters **Standby Mode** and is ready for operation.

2. Once the MT30 triggered by either hardware or software method, it will emit a narrow, horizontal slab of light which is aligned with the sensor's field of view.

3. The linear image sensor captures the linear image of barcode and produces an analog waveform, which is sampled and analyzed by the decoder firmware running on the MT30.

4. Upon a successful barcode decoded, the MT30 turns off the illumination LEDs, sends the Good Read signals over Buzzer and LED pins and transmits the decoded data to the host.

5. The MT30 may enter **Sleep Mode** (Please see Chapter 6 for more details) after a period of inactivity in order to reduce power consumption.

2-5. Mechanical Dimension

(Unit = mm)
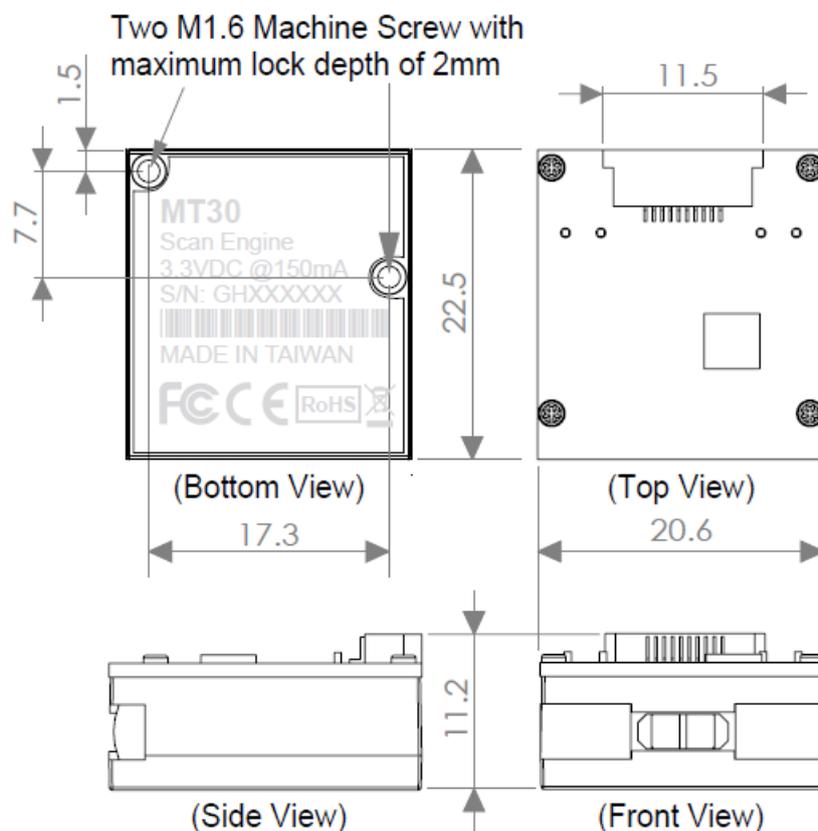
2-6. Scanning Range

Test Condition - MT30

Barcode Length:	Code39 – 4 characters
	EAN/UPC – 13 characters
Bar & Space Ratio:	1 to 2.5
Print Contrast Ratio:	0.9
Ambient Light:	> 800 lux

Depth of Field

3mil CODE39 (60~90mm)
4mil CODE39 (60~120mm)
5mil CODE39 (50~160mm)
10mil CODE39 (35~340mm)
13mil UPC/EAN (35~400mm)
15mil CODE39 (50~520mm)
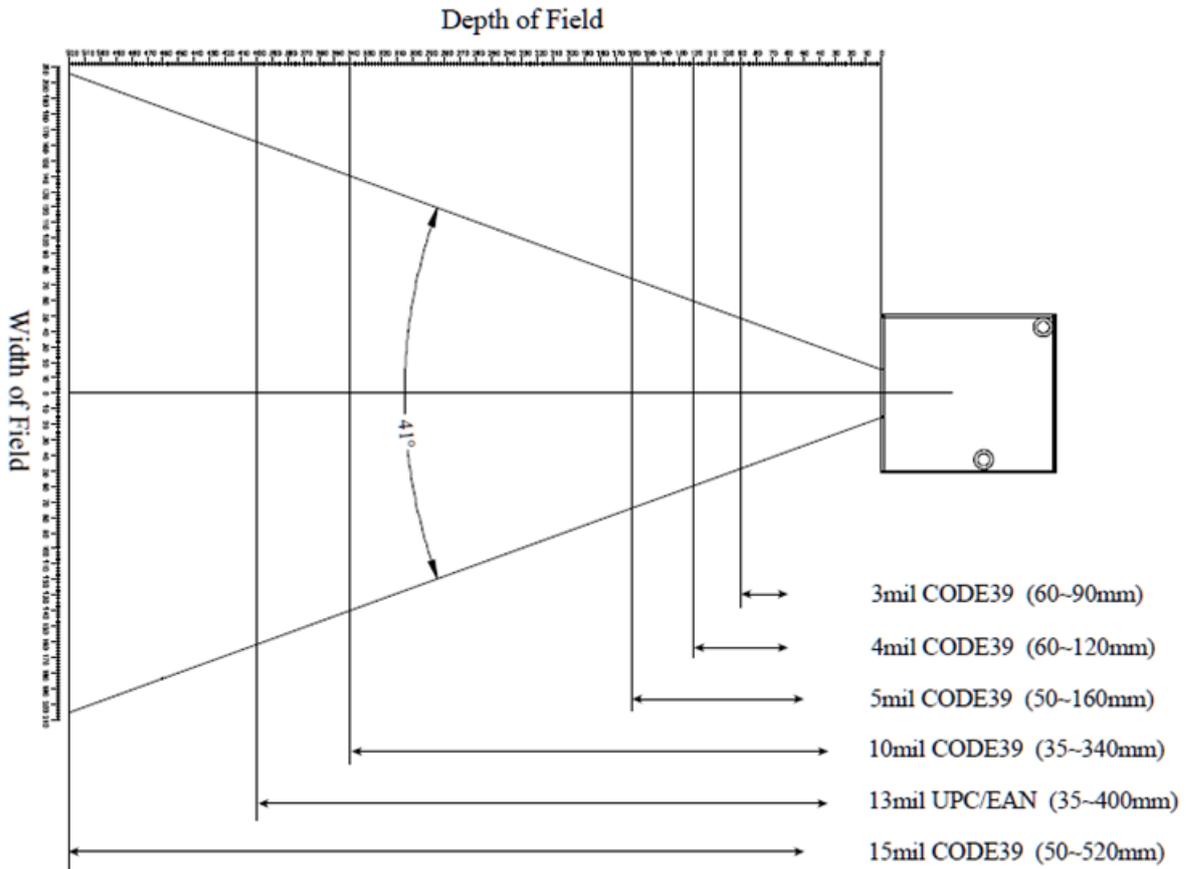
Minimum & Maximum Scan Distance of MT30

Symbology	Resolution	Distance	No. of Encoded Characters
Standard Code 39 (w/o checksum)	3 Mil	60 ~ 90 mm	4 char.
	4 Mil	60 ~ 120 mm	
	5 Mil	50 ~ 160 mm	
	10 Mil	35 ~ 340 mm	
	15 Mil	50 ~ 520 mm	
EAN 13	13 Mil	35 ~ 400 mm	13 char.

Maximum Scan Width of MT30

Symbology	Resolution	Barcode Length	No. of Encoded Characters
Standard Code 39 (w/o checksum)	13 Mil	200 mm	37 char.

2-7. Pitch Angle, Roll Angle and Skew Angle

Be aware of the tolerance for the pitch, roll and skew angle of bar code you are trying to scan.
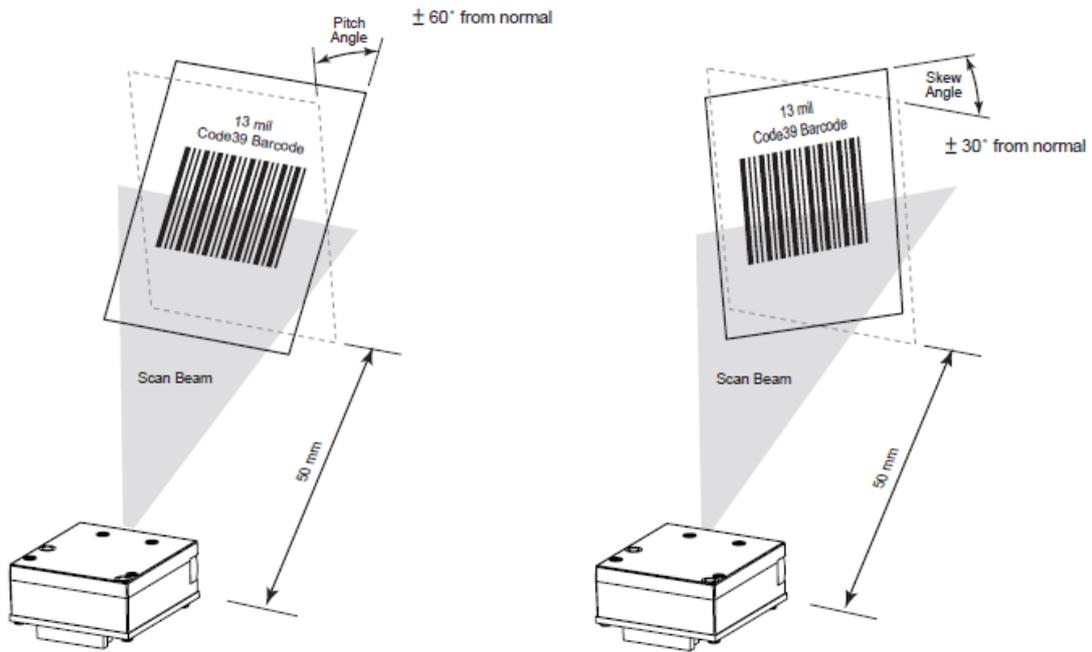
Pitch Angle: ± 60°

Skew Angle: ± 30°
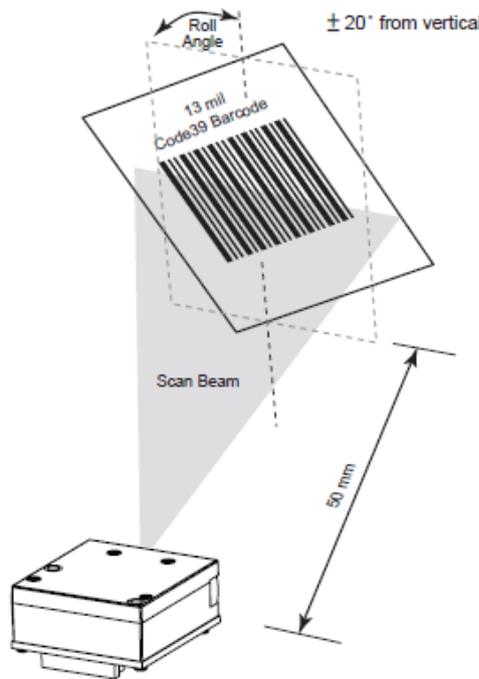
Roll Angle: ± 20

2-8. Specular Dead Zone

Do not place the MT30 directly over the barcode. The light reflecting directly back into the MT30 from the barcode is known as specular reflection, which can make decoding difficult. The specular dead zone of MT30 is up to 5° depending on target distance and substrate glossiness.

Specular Dead Zone: ± 5°
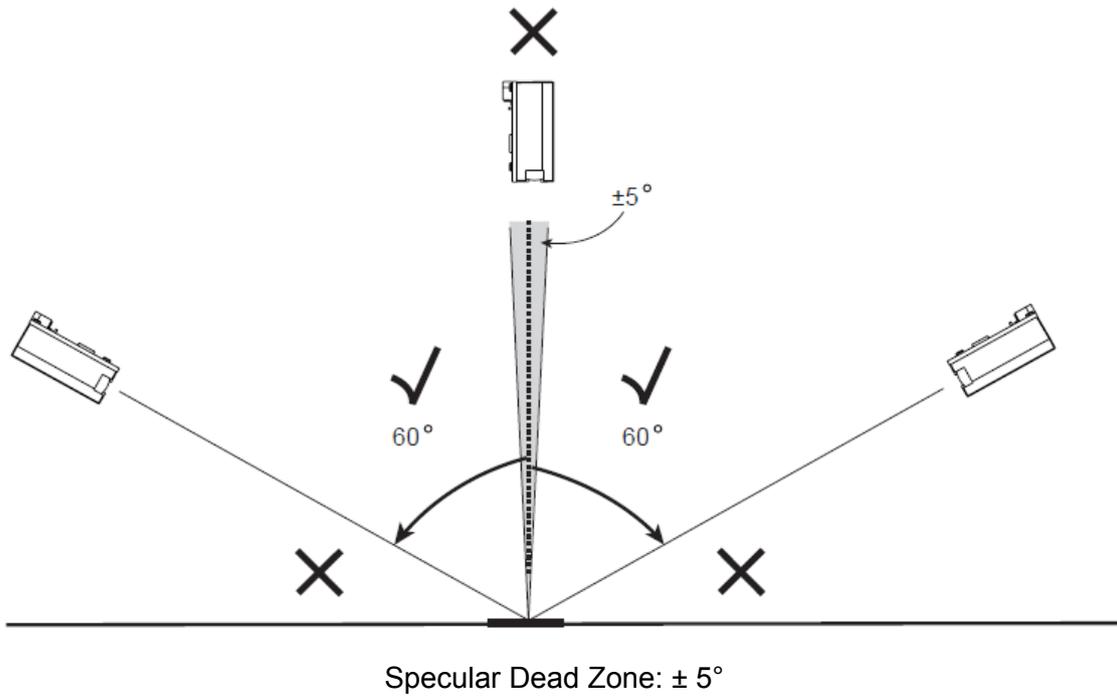
2-9. Curvature Degree

The curvature degree of a scanned barcode is specified as below:
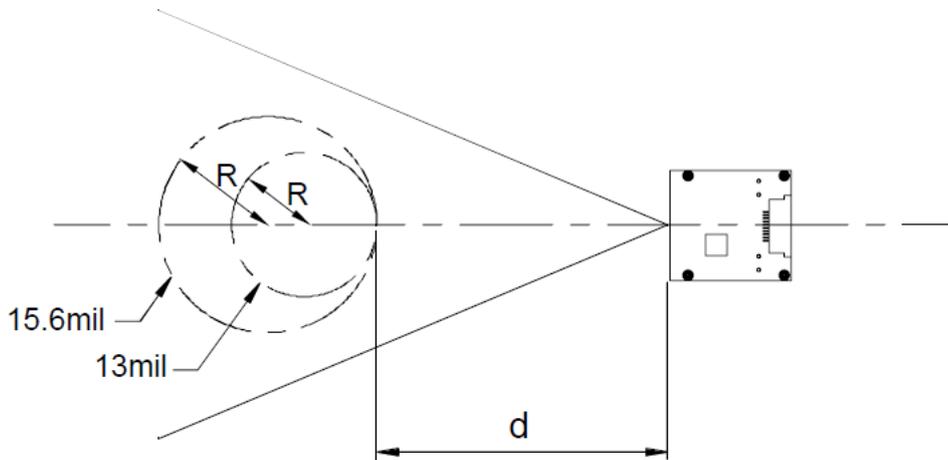
Barcode	EAN13 (L=37mm)	
Resolution	13 mil (0.33 mm)	15.6 mil (0.39 mm)
R	R $\geq$ 20 mm	R $\geq$ 25 mm
d	90 mm	120 mm
PCS	0.9 (printed on photographic paper)	

2-10. Flex Cable Specification

Below is the drawing of flat cable(P/N: 67XX-1009X12) that comes with MT30.
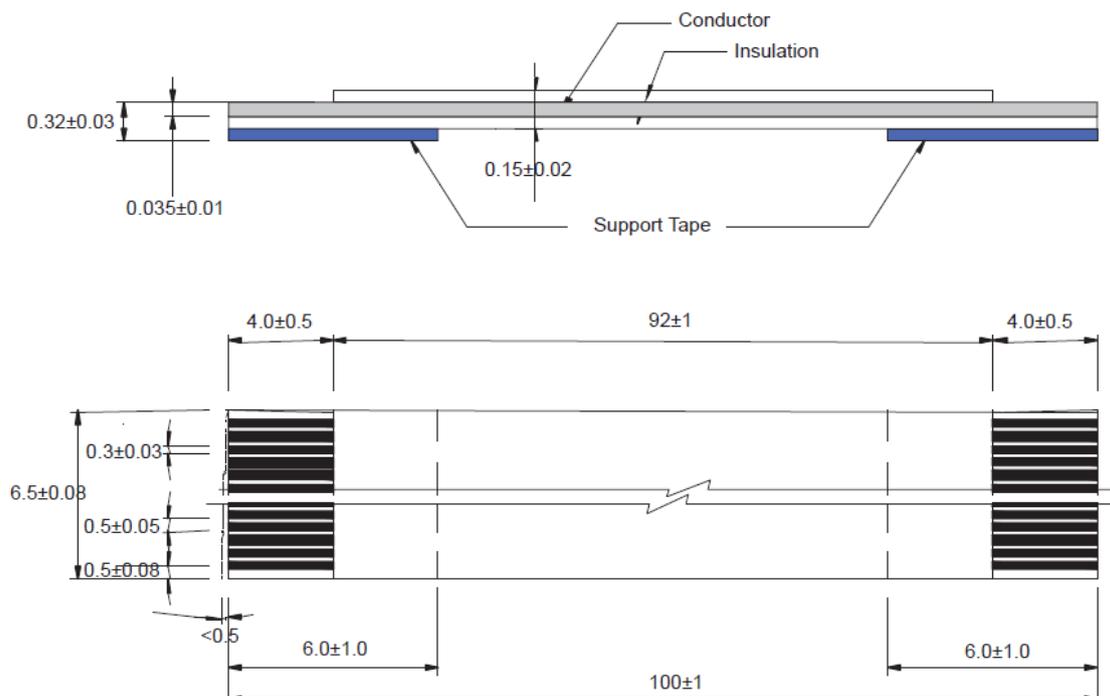
2-11. Screw Specification

Below is the drawing of M1.6x4 screws(P/N: 4210-1604X01) that come with MT30.

2-12. Connector Specification

Below is the drawing of 12-pin 0.5-pitch FPC Connector(P/N: 4109-0050X00) of MT30.

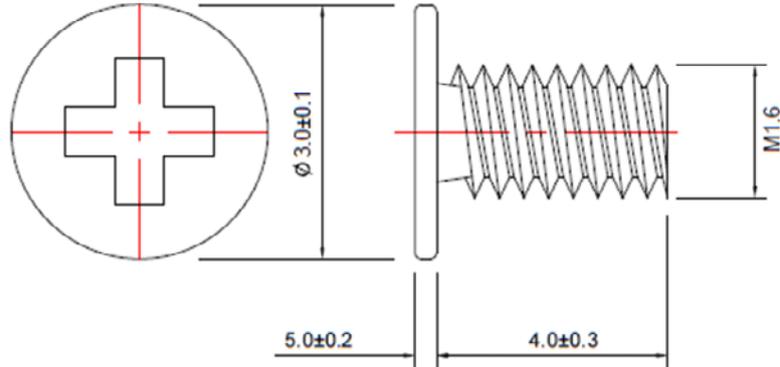| FPC THICKNESS	D	C	B	A	EMBOSSED TAPE 製品番号 ORDER No.	MATERIAL No. オーダー番号	極数 CK+
0.28±0.03	13.65	17.0	12.5	18.2	54548-2671	54548-2629	26
	12.65	16.0	11.5	17.2	54548-2471	54548-2429	24
	12.15	15.5	11.0	16.7	54548-2371	54548-2329	23
	11.65	15.0	10.5	16.2	54548-2271	54548-2229	22
	11.15	14.5	10.0	15.7	54548-2171	54548-2129	21
	10.65	14.0	9.5	15.2	54548-2071	54548-2029	20
	10.15	13.5	9.0	14.7	54548-1971	54548-1929	19
	9.65	13.0	8.5	14.2	54548-1871	54548-1829	18
	9.15	12.5	8.0	13.7	54548-1771	54548-1729	17
	8.65	12.0	7.5	13.2	54548-1671	54548-1629	16
	8.15	11.5	7.0	12.7	54548-1571	54548-1529	15
	7.65	11.0	6.5	12.2	54548-1471	54548-1429	14
0.3±0.03	7.15	10.5	6.0	11.7	54548-1371	54548-1329	13
	6.65	10.0	5.5	11.2	54548-1271	54548-1229	12
	6.15	9.5	5.0	10.7	54548-1171	54548-1129	11
	5.65	9.0	4.5	10.2	54548-1071	54548-1029	10
	5.15	8.5	4.0	9.7	54548-0971	54548-0929	9
	4.65	8.0	3.5	9.2	54548-0871	54548-0829	8
	4.15	7.5	3.0	8.7	54548-0771	54548-0729	7
	3.65	7.0	2.5	8.2	54548-0671	54548-0629	6
	3.15	6.5	2.0	7.7	54548-0571	54548-0529	5
	2.65	6.0	1.5	7.2	54548-0471	54548-0429	4

MODEL No. 54548-**29

GENERAL TOLERANCES (UNLESS SPECIFIED)

10 UNDER	±0.2	
10 OVER 30 UNDER	±0.25	
30 OVER	±0.3	
ANGULAR ±3°		

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

DIMENSION STYLE: MM ONLY
SCALE: 10:1
DESIGN UNITS: METRIC
THIRD ANGLE PROJECTION

DRAWN BY: HSHIMABUKURO DATE '04/02/10
CHECKED BY: KTOJO DATE '04/02/10
APPROVED BY: MSASAO DATE '04/02/10

TITLE: 0.5 FPC CONN ZIF HSG ASSY FOR SMT RA BTM CONT -LEAD FREE-

molex MOLEX INCORPORATED

MATERIAL NO.: SEE TABLE
DOCUMENT NO.: SD-54548-039
SHEET NO.: 1 OF 2

SIZE A3 THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

EN-02JA(021)

3. INSTALLATION

The MT30 scan engine is designed specifically for integration into customer's housing for OEM applications. However, the MT30's performance will be adversely affected or permanently damaged when mounted into an unsuitable enclosure.

Warning: The limited warranty is void if the following recommendations are not adhered to when mounting the MT30.

## 3-1. Electrostatic Discharge Cautions

All MT30s are shipped in ESD protective packaging due to the sensitive nature of the exposed electrical components.

1. ALWAYS use grounding wrist straps and a grounded work area when unpacking and handling the MT30.
2. Mount the MT30 in a housing that is designed for ESD protection and stray electric fields.

3-2. Mechanical Dimension

When securing the MT30 by utilizing the machine screws:

1. Leave sufficient space to accommodate the maximum size of the MT30.
2. Do not exceed 1kg-cm (0.86 lb-in) of torque when securing the MT30 to the host.
3. Use safe ESD practices when handling and mounting the MT30.
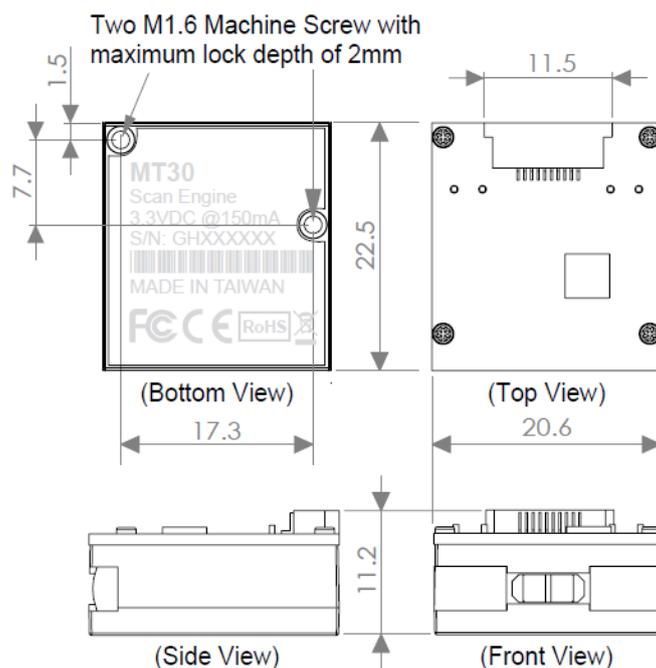
3-3. Window Materials

Following are descriptions of three popular window materials:

1. Poly-methyl Methacrylic (PMMA)
2. Allyl Diglycol Carbonate (ADC)
3. Chemically tempered float glass

Cell Cast Acrylic (ASTM: PMMA)

Cell cast Acrylic, or Poly-methyl Methacrylic is fabricated by casting acrylic between two precision sheet of glass. This material has very good optical quality, but is relatively soft and susceptible to attack by chemicals, mechanical stress and UV light. It is strongly recommended to have acrylic hard-coated with Polysiloxane to provide abrasion resistance and protection from environmental factors. Acrylic can be laser-cut into odd shapes and ultrasonically welded.

### Cell Cast ADC, Allyl Diglycol Carbonate (ASTM: ADC)

Also known as CR-39^{TM}, ADC, a thermal setting plastic widely used for plastic eyeglasses, has excellent chemical and environmental resistance. It also has an inherently moderate surface hardness and therefore does not require hard-coating. This material cannot be ultrasonically welded.

Chemically Tempered Float Glass

Glass is a hard material which provides excellent scratch and abrasion resistance. However, un-annealed glass is brittle. Increased flexibility strength with minimal optical distortion requires chemical tempering. Glass cannot be ultrasonically welded and is difficult to cut into odd shapes.

Property	Description
Spectral Transmission	85% minimum from 635 to 690 nanometers
Thickness	< 1 mm
Coating	Both sides to be anti-reflection coated to provide 1% maximum reflectivity from 635 to 690 nanometers at nominal window tilt angle. An anti-reflection coating can reduce the light that is reflected back to the host case. Coatings will comply with the hardness adherence requirements of MIL-M-13508.

3-4. Window Specifications
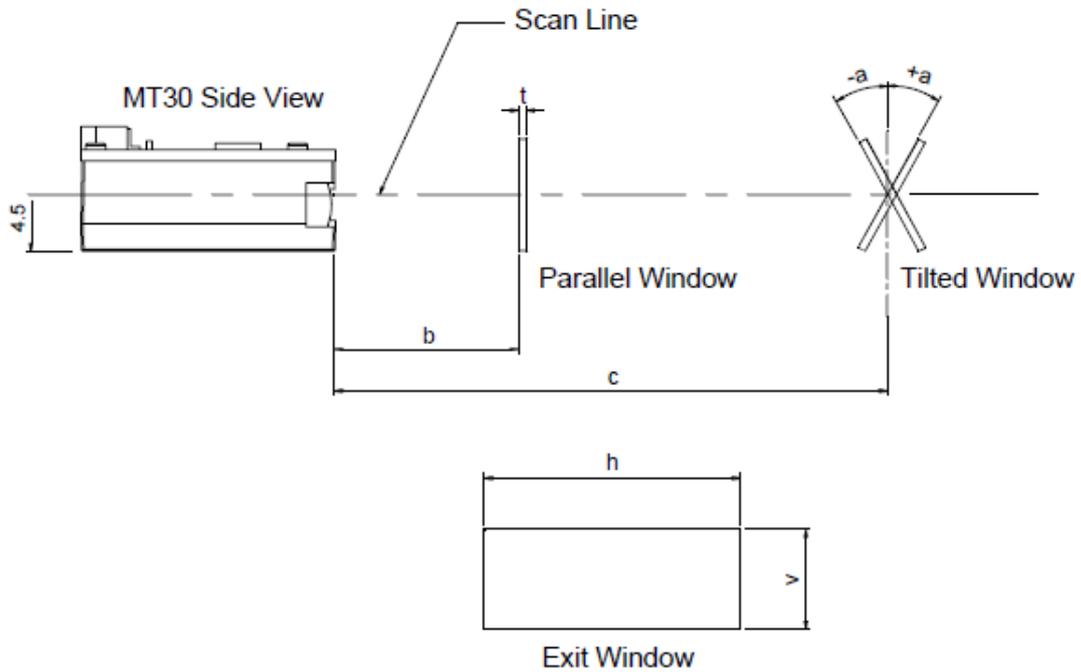
Window Specifications for MT30 Integration					
Distance	Tilt Angle (a)		Minimum Window Size		
			Horizontal (h)	Vertical (v)	Thickness (t)
0 mm (b)	0	0	21 mm	8 mm	< 1 mm
10 mm (c)	+20°~	-20°~	40 mm	11 mm	
20 mm (c)	+12°~	-12°~	45 mm	13 mm	
30 mm (c)	+8°~	-8°~	50 mm	15 mm	

The window size must increase as it is moved away from MT30 and should be sized to accommodate the field of view and illumination envelopes shown below:
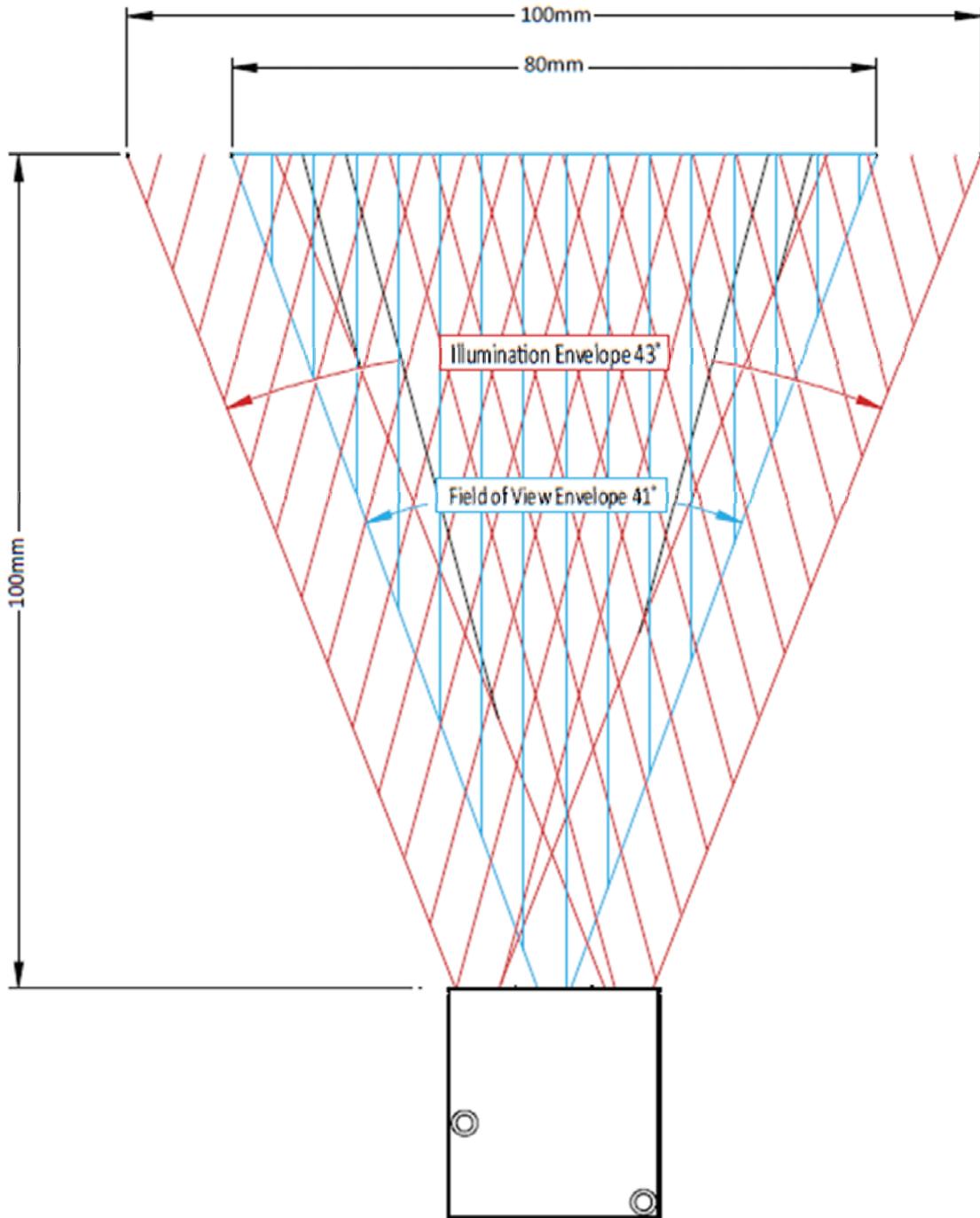
MT30

3-5. Window Care

In the aspect of window, the performance of MT30 will be reduced due to any kind of scratch. Thus, reducing the damage of window, there are few things have to be noticed.

1. Avoid touching the window as much as possible.

2. When cleaning the window surface, please use non-abrasive cleaning cloth, and then gently wipe the host window with the cloth that is already sprayed with glass cleaner.

4. REGULATIONS

The MT30 scan engine conforms to the following regulations:

1. Electromagnetic Compliance – CE EN55022, EN55024
2. Electromagnetic Interference – FCC Part15 Subpart B (Class B)
3. Photobiological Safety – IEC 62471 (Exempt Group)
4. Environmental Regulations – RoHS 2.0, WEEE

5. DEVELOPMENT KIT

MARSON MB100 Demo Kit (P/N: 11A0-9801A20) enables the development of products and systems using the MT30 on the MS Windows OS platform. Besides the Multi I/O board (P/N: 2006-1007X00), the MB100 Demo Kit provides the software and hardware tools required for testing the MT30 applications before integrating it into the host device. Please contact your sales representative for ordering information.

MB100 Multi I/O Board (P/N: 2006-1007X00)

Connects to MT30 ⤑

MB100 Demo Kit Accessories   O: Supported   X : Not Supported

Cable \ Interface	RS232	USB HID	USB VCP
External Y-cable (P/N: 7090-1583A00)	o	o	o
Internal Y-cable (P/N: 5300-1315X00)	o	o	o
Micro USB Cable (P/N: 7005-9892A50)	x	o	o

Due to the advantage of its small size, MB100 Multi I/O board is also suitable for being installed inside the host system, as an interface board connecting MT30 to the host device.

6.5mm

61.5mm

16.5mm   23mm

43.8mm

screw hole x 4 (∅1.8mm)
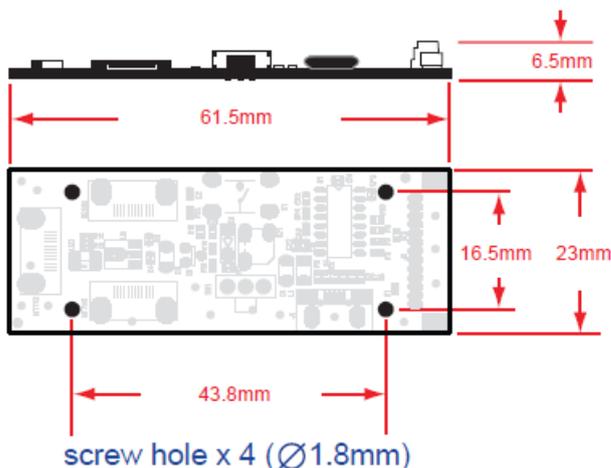
6. SLEEP (IDLE) MODE

The **Sleep (Idle) Mode** is disabled by default. To enable **Sleep (Idle) Mode**, simply follow below instruction to configure the "Pre-Idle Time", or the period of inactivity before MT30 enters Sleep (Idle) Mode, as appropriate.
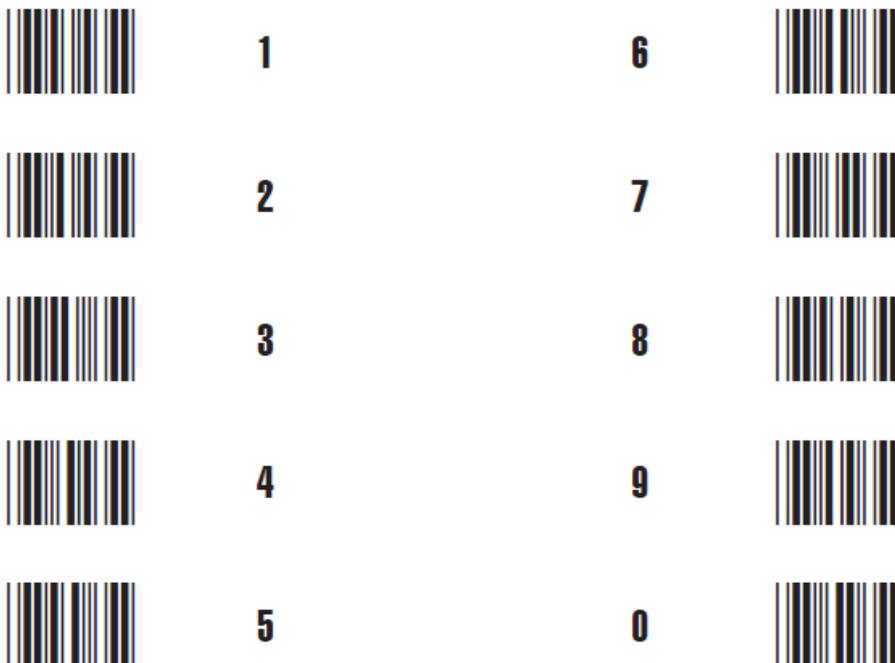
A. Standard Mode
Firmware version: SM3-j-x.xx
(MT30 P/N: 1030-A000000)

Steps:

1. Scan SET MINUTE [.B030$] or SET SECOND [.B029$]
2. Scan two digit from the numeric barcode table below.
3. Scan SET MINUTE [.B030$] or SET SECOND [.B029$]

Notes:

Pre-Idle Time - Min: 10 sec, Max: 60 min & 60 sec

. B030$

SET MINUTE (Range: 00 ~ 60)

. B029$

SET SECOND (Range: 00 ~ 60)

	1	6	
	2	7	
	3	8	
	4	9	
	5	0	

B. Command Mode

Firmware version: SM3-k-x.xx.CMD

(MT30 P/N: 1030-A000001)

Property	Option	Remark
Sleep (Idle) Mode {MC11WT**1**}	**0** Off **1** On	Default : **Off** When enabled, scanner will automatically enter **Sleep Mode** after a period of inactivity(Sleep Mode timeout).
Pre-Idle Time {MC11WT,**1**,**0**}	A number from **0~60** (Minute) A number from **0~60** (Second)	Default : **1 minute** **Sleep Mode** timeout(10 sec ~ 60 min & 60 sec), the period of inactivity before the scanner enters **Sleep Mode.**

Steps:

1. Send {MC11WT1} & {MC11WT,1,0} to the MT30 if you want to enable **Sleep (Idle) Mode** and set Pre-Idle Time as 1 minute.
2. The MT30 will return {MC11,OK} and {MC11,1,1,0} respectively as confirmation.
3. If you want above settings to be saved permanently in Flash ROM, send {MCMDWT1} to the MT30. Otherwise MT10 will be reset to default after wake up from sleep..

Notes:

Curly braces "{ }" must be included at both ends of each command.

7. PARAMETER SETUP

You can set up your MT30 using one of the following methods:

1. **Standard Mode (F/W ver.: SM3-j-x.xx):**

   Scan configuration barcodes from the Universal User's Manual, or use Ez Utility®, both of which are available for download at www.marson.com.tw

2. **Command Mode (F/W ver.: SM3-j-x.xx.CMD):**

   Send software commands from the host, or use BEO®, which is available for download at www.marson.com.tw. Full list of software commands can be found in the Help File of BEO program, on the chapter *Test Window/ Command Operation.*

8. VERSION HISTORY

Rev.	Date	Description	Issued	Checked
1.0	2016.10.04	Initial Release	Shaw	Kenji & Hus
1.1	2016.10.31	Revised Sleep Mode command in Chapter 6	Shaw	Kenji & Hus
1.2	2016.12.23	Updated D.O.F	Shaw	Kenji & Hus
1.3	2017.06.21	Deleted Red Cell-Cast Acrylic Descriptioin	Shaw	Hus
1.4	2018.03.15	Updated Chapter 1 and 1-1 on MCU. Updated Chapter 6 on Command Mode settings.	Shaw	Kenji

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