

**EN/ IEC 60825-1 Test Report**

for

**Laser Module**

**Model :**

**75-702-92 = TIM-201-5D**

**By**

**ELFA Distrelec AB**

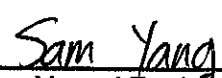



**TEST REPORT  
EN / IEC 60825-1**

**Part 1: Equipment classification and requirements**

Report Reference No.....	UT101027M1
Date of issue .....	April 10 , 2012
Total number of pages .....	12
Applicant's name.....	ELFA Distribo AB
Address .....	ELEKTRONIKHOJDEN 22 , 17580 N JARFALLA SWEDEN
Test item description .....	Laser Module
Trade Mark.....	ELFA
Manufacturer .....	Transverse Industries Co., Ltd. No. 305 ,Hua Cheng Rd., Hsin Chuang Dist , New Taipei City 242, Taiwan ,R.O.C.
Model/Type reference .....	75-702-92 = TIM-201-5D
Ratings .....	3 V dc ( laser module power )
<b>Test specification:</b>	
Standard.....	EN60825-1 : 2007, IEC 60825-1 : 2007 (2nd Edition)
Test procedure .....	CB / CCA
Non-standard test method.....	N/A
Testing Laboratory .....	Universal Testing Inc.
Address .....	2F, No.13,Lane 28, Sec. 1, Huanshan Rd., NeiHu, Taipei 114, Taiwan

**CONCLUSION:** See appended table for the maximum emissions measured and the classifications

Prepared by:	Reviewed by:
	
Sam Yang / Engineer April 10, 2012	Steven Chang / Manager April 10, 2012



**General Remark**

Details and test results are given in subsequent pages of this report.

This report refers only to the unit(s) submitted for test. This report shall not be reproduced except in full, without written approval of the issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.  
"(see appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator.



EN / IEC 60925-1

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Copy of marking plate

( will be provided according to each laser product classification)

Summary of testing:

Complies with Class 3R Laser Product limit in normal and abnormal conditions.  
The report was issued for considering the hazards from the laser radiation only.

Test item particulars:

Classification of installation and use .....

Supply Connection..... DC

Possible test case verdicts:

- test case does not apply to the test object ..... N/A
- test object does meet the requirement..... P (Pass)
- test object does not meet the requirement..... F (Fail)

Testing .....

Date of receipt of test item..... March 26, 2012

Date (s) of performance of tests..... April 10, 2012

General product information:

The equipment is a laser module with a laser aperture at the tip .  
The operating voltage is 3 Vdc .  
Laser is visible red color with typical wavelength of 650 nm.  
All types use the same laser diode and circuit, only the enclosures are different.

The laser emission complies with the limit for Class 3R Laser product at normal and abnormal condition.



EN/IEC 60825-1

Clause	Requirement + Test	Result - Remark	Verdict
4	<b>ENGINEERING SPECIFICATIONS</b>		P
4.1	General remarks		P
	Modification	Not a modified laser product	N/A
4.2	Protective housing	The equipment is with an enclosure that needs a tool to open. Laser emission is for intended use	P
4.2.1	General		N/A
4.2.2	Service	No service necessary	N/A
4.2.3	Removable laser system		N/A
4.3	Access panels and safety interlocks		N/A
4.3.1	Access panels of protective housing	No access panel	N/A
	Product Class .....	Class 3R	N/A
	Accessible emission during removal of access panel .....		N/A
	The removal of the panel gives access to laser radiation levels designated by "X" in the table		N/A
	Accessible emissions after removal .....		N/A
4.3.2	Deliberate override mechanism		N/A
4.4	Remote interlock connector	Not a Class 3B or Class 4 laser product	N/A
4.5	Manual reset		N/A
4.6	Key control	Not a Class 3B or Class 4 laser product	N/A
4.7	Laser radiation emission warning		N/A
4.7.1	Class 3R ( $\lambda < 400 \text{ nm}$ ; $\lambda > 700 \text{ nm}$ ), 3B and 4		N/A
4.7.2	Audible or visible warning	Not a Class 3B or Class 4 laser product	N/A
4.7.3	Operational control and laser aperture		N/A
4.7.4	Laser emission distributed through more than one output		N/A
4.8	Beam stop or attenuation	Not a Class 3B or Class 4 laser product	N/A
4.9	Controls	Not a Class 3B or Class 4 laser product	N/A
4.10	Viewing optics	Not used	N/A



**EN / IEC 60825-1**

Clause	Requirement + Test	Result- Remark	Verdict
	a) Human access to laser radiation in excess of Class 1M prevented when the shutter is opened or attenuation varied		N/A
	b) Opening of the shutter or variation of the attenuation prevented when exposure to laser radiation in excess of Class 1M is possible		N/A
4.11	Scanning safeguard		N/A
4.12	Walk-in access		N/A
	a) Means provided so that any person inside the housing can prevent activation of a Class 3B or 4 laser hazard		N/A
	b) A warning device provides adequate warning of emission to any person within the housing		N/A
	c) Where "walk-in" access during operation is intended or reasonably foreseeable, emission of laser radiation that is equivalent to Class 3B or Class 4 while someone is present inside the enclosure of Class 1, Class 2 or Class 3R product shall be prevented by engineering means		N/A
4.13	Environmental conditions		P
	- climatic conditions	No degradation in the declared operating environment	P
	- vibration and shock	considered	P
4.14	Protection against other hazards		N/A
4.14.1	Non-optical hazards (product safety standard)	Evaluated separately	N/A
	- electrical hazards;		N/A
	- excessive temperature;		N/A
	- spread of fire from the equipment;		N/A
	- sound and ultrasonic;		N/A
	- harmful substances;		N/A
	- explosion;		N/A
4.14.2	Collateral radiation		N/A
<b>5</b>	<b>LABELLING</b>		<b>N/A</b>
5.1	General	To be put on end products	N/A
	<b>LASER PRODUCT CLASS</b>	<b>Class 3R</b>	
	Labelling location (Product / User Instruction / Package)		N/A



EN / IEC 60825-1

Clause	Requirement - Test	Result - Remark	Verdict
	Warning label - Hazard symbol (Figure 1)		N/A
	Explanatory label (Figure 2)		N/A
5.2-5.6	Text on explanatory label		N/A
5.7	Aperture label		N/A
5.8	Radiation output and standards information		N/A
	Max output of laser radiation		N/A
	Pulse duration		N/A
	Emitted wavelength(s)		N/A
	The name and publication date of the standard...		N/A
5.9	Labels for access panels		N/A
5.9.1 a) - f)	Warning wording used	No access panel	N/A
5.9.2	Labels for safety interlocked panels		N/A
	Warning wording used	No interlock panel	N/A
5.10	Warning for invisible laser radiation		N/A
5.11	Warning for visible laser radiation		N/A

6	<b>OTHER INFORMATIONAL REQUIREMENTS</b>		N/A
6.1	Information for the user	Component only	N/A
	a) adequate instructions for proper assembly, maintenance and safe use and description of the classification limitations, if appropriate		N/A
	b) warning for Class 1M and 2M		N/A
	c) laser beam parameters for radiation above the AEL of Class 1		N/A
	• Wavelength		N/A
	• Beam divergence		N/A
	• Pulse duration		N/A
	• Maximum power or energy output		N/A
	d) embedded laser products and other incorporated laser products		N/A
	e) MPE and NOHD for Class 3B and Class 4 laser products For collimated beam Class 1M and 2M lasers the extended NOHD (ENOHD)		N/A
	f) information for the selection of eye protection		N/A



EN/IEC 60925-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.3	Laser processing machines	Not a processing machine	N/A
	Comply with IEC/ISO 11553-1		N/A
7.4	Electric toys	Not a toy	N/A
	Comply with IEC 62115		N/A
7.5	Consumer electronic products	Evaluated separately	N/A
	Complying with IEC 60950 or IEC 60955		N/A

8	CLASSIFICATION		P
8.2	Classification responsibilities		P
8.3	Classification rules	Rules followed. See below.	P
8.3a	Radiation of a single wavelength	650 nm	P
8.3b	Radiation of multiple wavelengths		N/A
	1) Laser product emission two or more wavelengths in spectral regions shown as additive in Table 5 ...		N/A
	2) Laser product emission two or more wavelengths in spectral regions not shown as additive in Table 5		N/A
8.3c	Radiation from extended sources	Not from an extended source	N/A
	Value of angular subtense $\alpha$ (mrad)	1.5 mrad	P
8.3d	Non-uniform retinal image radiance profile, non-circular and multiple sources		N/A
8.3e	Time basis		P
	1) 0.25s		N/A
	2) 100s	considered	P
	3) 30000s		N/A
8.3f	Repetitively pulsed or modulated lasers	Continuous wave	N/A
	1) Exposure from any single pulse not exceeding the AEL for a single pulse		N/A
	2) Average power for a pulse train		N/A
	3a) Constant pulse energy and pulse duration		N/A
	3b) Varying pulse widths or varying pulse durations		N/A

9	DETERMINATION OF ACCESSIBLE EMISSION LEVELS		
9.1	Tests		P
	Single fault eliminated		P



ENV ISO 9001

Clause	Requirement + Test	Result - Remark	Verdict
	Housing material withstanding degradation		P
	Fault detection	The resistor RS is short-circuited	P
9.2	Measurement conditions		P
	Measured laser radiation	See table "measured laser radiation, calculations and comparison with AEL limits"	P
9.3	Measurement geometry		P
9.3.1	General, evaluation scheme		
	a) Simplified (default) method	$C_6 = 1$	P
	b) Increased AEL by parameter $C_6$		N/A
9.3.2	Default (simplified) evaluation		P
	Condition applied	Condition 2 ( worst case )	P
	Aperture stop diameter (mm)	7 mm	P
	Measurement distance (mm)	70 mm	P
9.3.3	Extended sources	Not an extended source	P
	$C_6$	1, see above	P
9.3.3a	Aperture diameters		P
	Condition applied	2	P
	Aperture stop diameter (mm)	7 mm	P
	Angular subtense of the apparent source $\alpha$	$< \alpha_{min}$	P
9.3.3b	Angle of acceptance		P
	Condition applied		P
	1) Photochemical retinal limits		N/A
	Angel of acceptance		N/A
	2) All other retinal limits		P
	Angel of acceptance	100 mrad	P





EN/ISO 9002:1

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

**Measured laser radiation, calculations and comparison with AEL limits:**

Measured at normal condition : 3.166 mW max.

Measured at single fault condition :

- 1) Resistor RS short circuited – No output . Laser Diode was damaged.

Calculation of the Class 3R Laser point emission limit :

AEL :  $5.0 \times 10^{-3} \text{ W} = 5 \text{ mW}$  (  $t \geq 0.25 \text{ s}$  )

The product is judged as Class 3R Laser Product.

National Differences for (country name)			N/A

Other:



EN / IEC 60825-1

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Appended table	EQUIPMENT MANUFACTURE INFORMATION ( DATA SHEET ) ABOUT THE CONTAINING LASER COMPONENT/S		P
	Manufacturer .....	Unien Optronics Corp.	—
	Type designation .....	SLD-650-P5-300-02	—
	Structure .....	φ 5.6mm Diameter Red Laser Diode	—
	Wavelength .....	640 - 665 nm	—
	Output power (min. and max.) .....	5 mW max.	—
	Radiation is		—
	Continuous .....	continuous	—
	Pulsed .....		—
	Pulse time .....		—
	Pulse repetition frequency .....		—
	Others .....	Operating temperature - 10 - 40 °C	—

PIC UP UNIT			N/A
	Manufacturer .....		—
	Type designation .....		—
	Others .....		—

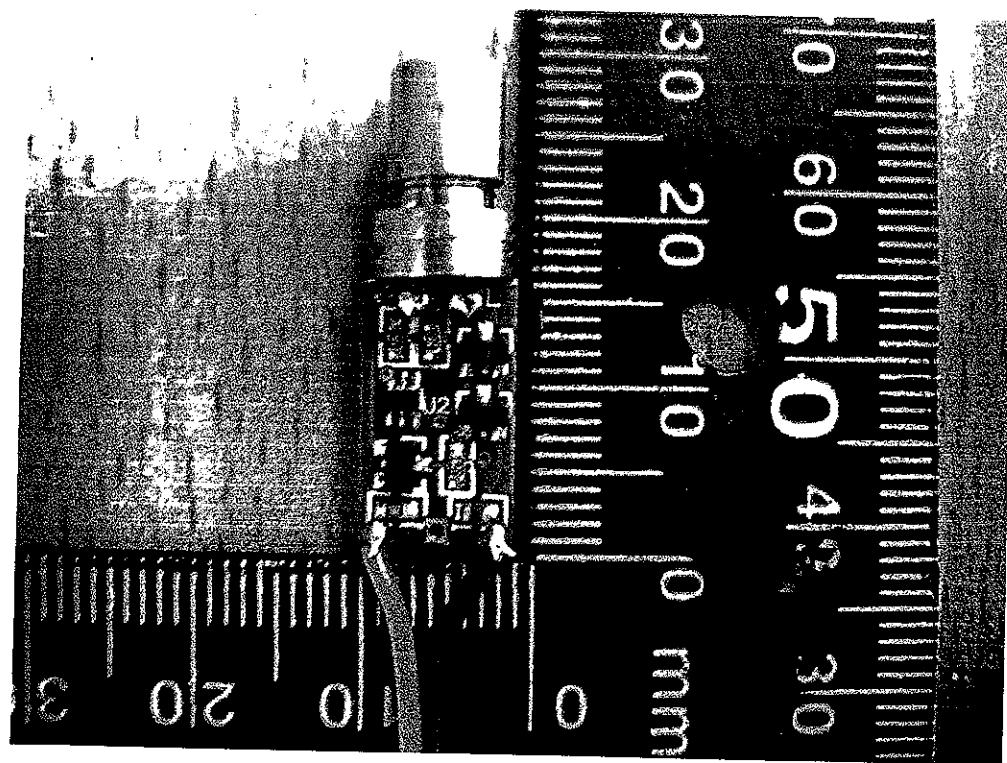
TRANSMITTER/TRANSCIEVER UNIT			N/A
	Manufacturer .....		—
	Type designation .....		—
	Others .....		—



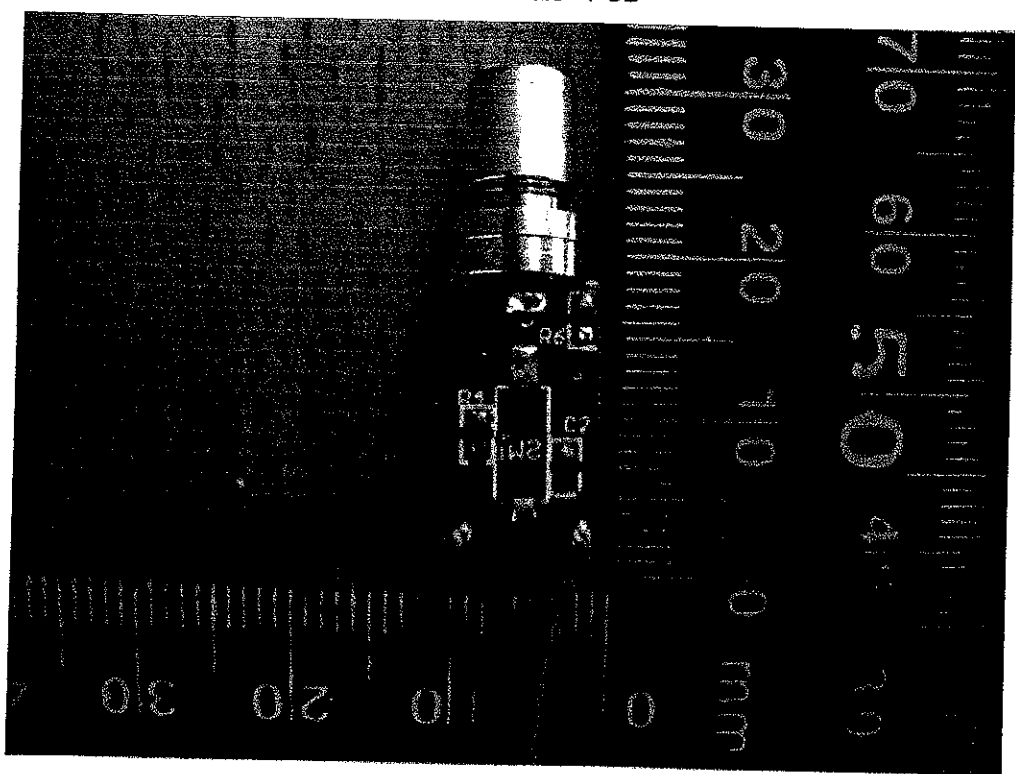
EN / IEC 60825-1

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

Attachment Photos



Laser Module PCB

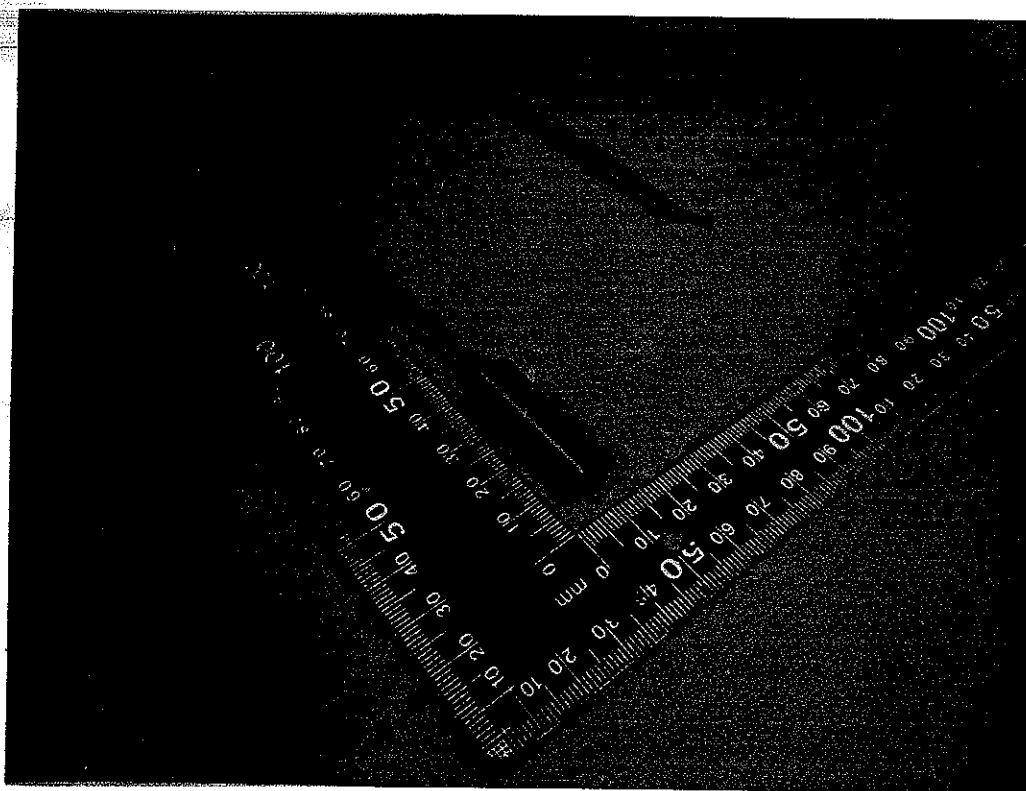


Laser Module PCB

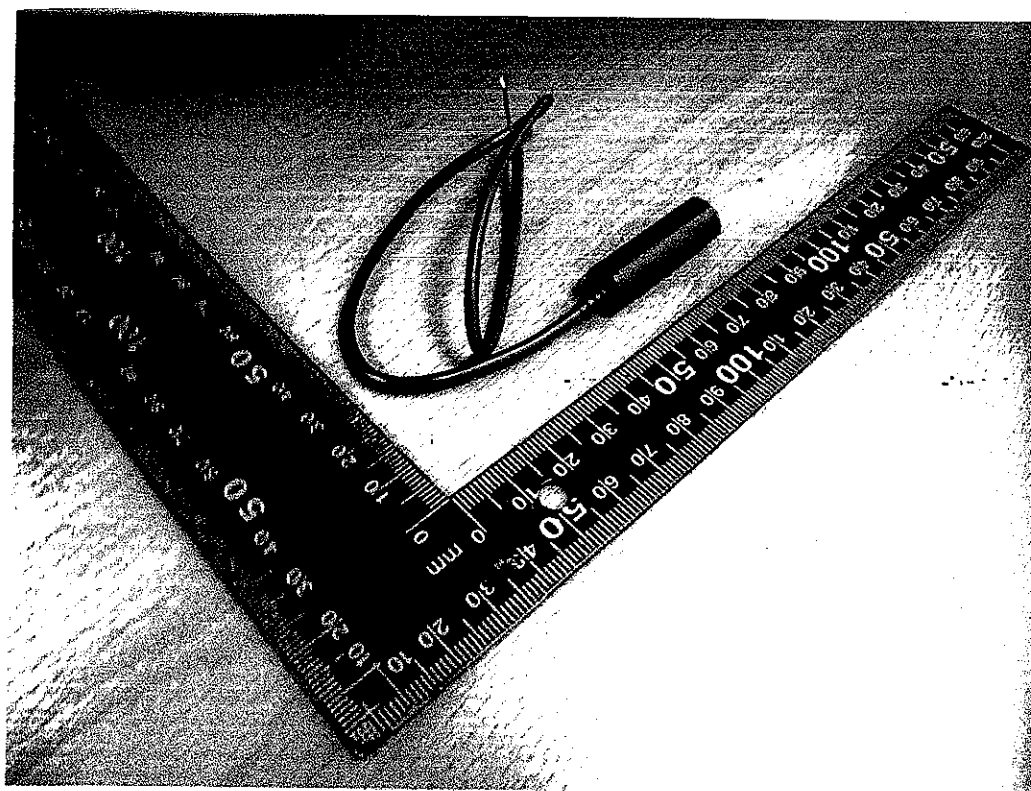


EN / IEC 60825-1

Clause	Requirement + Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------



Laser Module



Laser Module