

**Inolux Technologies 0.28" Dual Digit Numeric SMD Display
HNSD28 Series**

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
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DISCLAIMER	3
ORDERABLE INFORMATION	4
FEATURES	5
SCHEMATIC DRAWING	6
PRODUCT CHARACTERISTIC	7
ABSOLUTE MAXIMUM RATING	7
ELECTRICAL AND OPTICAL CHARACTERISTIC	8
RECOMMENDED SOLDER FOOTPRINT	9
CHARACTERISTIC CURVES FOR UB	10
CHARACTERISTIC CURVES FOR TG	11
CHARACTERISTIC CURVES FOR UYG	12
CHARACTERISTIC CURVES FOR UY	13
CHARACTERISTIC CURVES FOR UA	14
CHARACTERISTIC CURVES FOR UR	15
CHARACTERISTIC CURVES FOR USR	16
REFLOW SOLDERING	17
SOLDERING IRON	17
REWORK	17
REVISION HISTORY	18

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 2/18

DISCLAIMER

- The information contained herein is presented only as a guide for the applications of our products.

No responsibility is assumed by INOLUX for any infringements of intellectual property or other rights of the third parties which may result from its use.

- Inolux is continually effort to improve the quality of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing INOLUX products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such INOLUX products cause loss of human life, bodily injury or damage to property.
- The INOLUX products listed in this document are intended for usage in general electronics (computer, personal equipment, office equipment, industrial robotics, domestic, etc...) These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury.
- In developing your designs, please ensure that INOLUX products are used within specified operating ranges as set forth in the most recent INOLUX products specifications.
- Also, please keep in mind the precautions listed in this document.

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 3/18

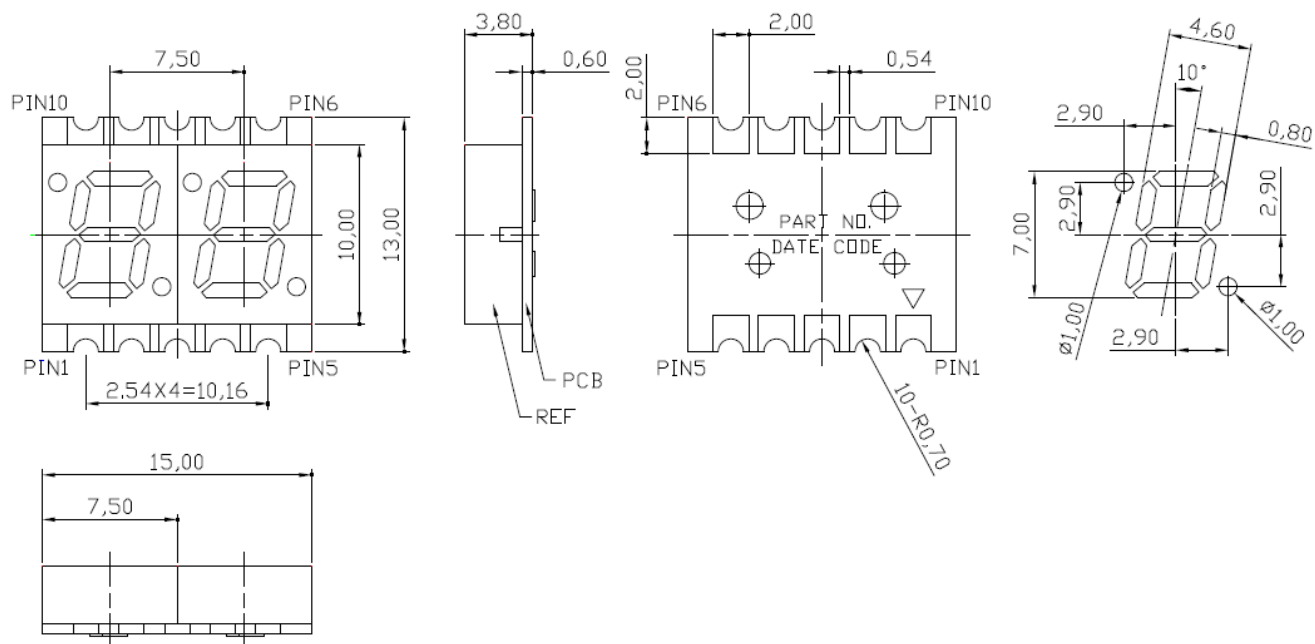
Orderable Information

H	N	S	D	28	X	X	X	-	X	X	X	X
↓		↓		↓	↓			↓	↓			
Series Name		Digit Height	Color Code					Polarity	Customer Code			
HNSD H: Inolux Technologies N: Numeric S: SMD Display D: Dual Digit		28: 0.28" Digit Height	UB: 470nm InGaN Blue TG: 525nm InGaN True Green UYG: 570nm AllnGaP Yellow Green UY: 590nm AllnGaP Yellow UA: 610nm AllnGaP Amber UR: 625nm AllnGaP Hyper Red USR: 640nm AllnGaP Super Red					A: Common Anode C: Common Cathode	XXXX: Customer specific code			

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 4/18

Features

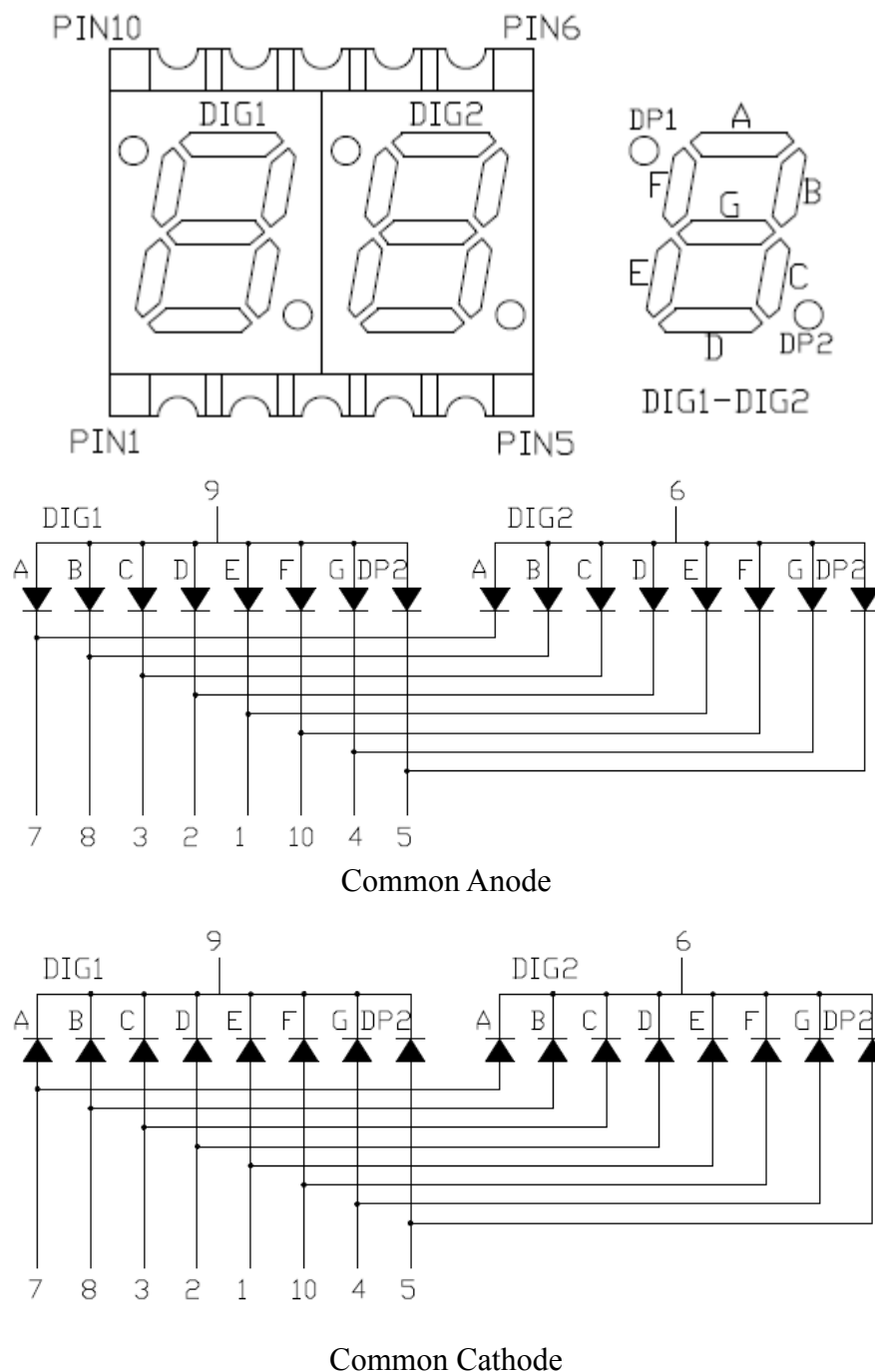
- 0.28" (7.0mm) Digit Height
- SMD Type Display
- Gray Face , White Segment
- RoHS Compliant, Pb Free



Note: Dimension is in millimeters. Tolerance is $\pm 0.25\text{mm}$ unless otherwise noted.

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 5/18

Schematic Drawing



Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 6/18

Product Characteristic

Absolute Maximum Rating

(T_a = 25°C)

Product	Emission Color	P _{AD} (mW)	I _{AF} (mA)	I _{PF} (mA)	V _R (V)	T _{OP} (°C)	T _{ST} (°C)	Derate From 25°C (mA/°C)
HNSD28UBA/ HNSD28UBC	Blue	120	30	100	5	-40 ~ +105	-40 ~ +105	0.3
HNSD28TGA/ HNSD28TGC	True Green	120	30	100	5	-40 ~ +105	-40 ~ +105	0.3
HNSD28UYGA/ HNSD28UYGC	Yellow Green	70	25	90	5	-40 ~ +105	-40 ~ +105	0.28
HNSD28UYA/ HNSD28UYC	Yellow	70	25	90	5	-40 ~ +105	-40 ~ +105	0.28
HNSD28UAA/ HNSD28UAC	Amber	70	25	90	5	-40 ~ +105	-40 ~ +105	0.28
HNSD28URA/ HNSD28URC	Hyper Red	70	25	90	5	-40 ~ +105	-40 ~ +105	0.28
HNSD28USRA/ HNSD28USRC	Super Red	75	30	100	5	-40 ~ +105	-40 ~ +105	0.3

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 7/18

Electrical and Optical Characteristic

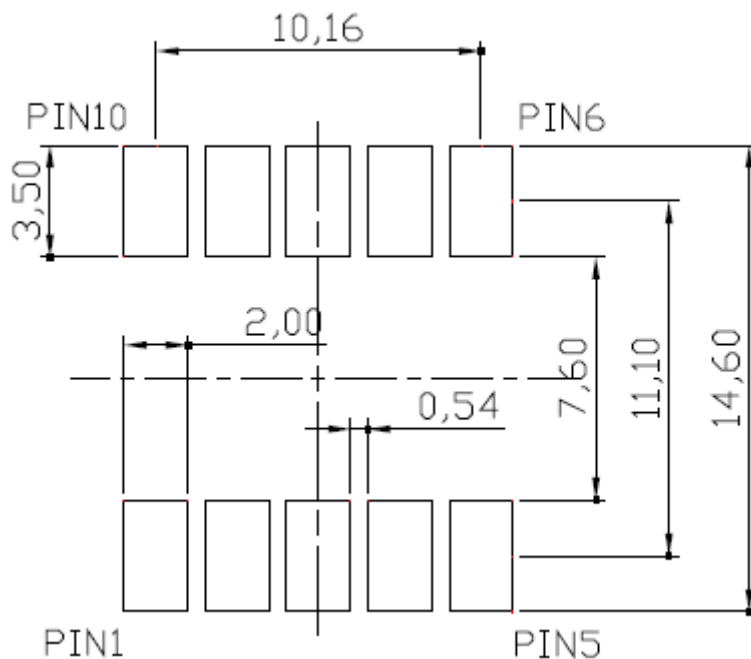
 (T_a= 25°C)

Product	Emission Color	I _F (mA)	V _F (V)		λ (nm)		I _V (mcd)	I _R (μA)
			Typ.	Max.	λ _d	Δλ	Typ.	Max
HNSD28UBA/ HNSD28UBC	Blue	20	3.2	4.0	470	30	20	10 (V _R =8V)
HNSD28TGA/ HNSD28TGC	True Green	20	3.2	4.0	525	30	50	10 (V _R =8V)
HNSD28UYGA/ HNSD28UYGC	Yellow Green	20	2.1	2.6	570	20	7	10 (V _R =5V)
HNSD28UYA/ HNSD28UYC	Yellow	20	2.0	2.6	590	20	10	10 (V _R =5V)
HNSD28UAA/ HNSD28UAC	Amber	20	2.0	2.6	610	20	10	10 (V _R =5V)
HNSD28URA/ HNSD28URC	Hyper Red	20	2.0	2.6	625	20	10	10 (V _R =5V)
HNSD28USRA/ HNSD28USRC	Super Red	20	2.0	2.6	640	20	2	10 (V _R =5V)

Luminous Intensity tolerance = +/- 15%

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 8/18

Recommended Solder Footprint



Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 9/18

Characteristic Curves for UB

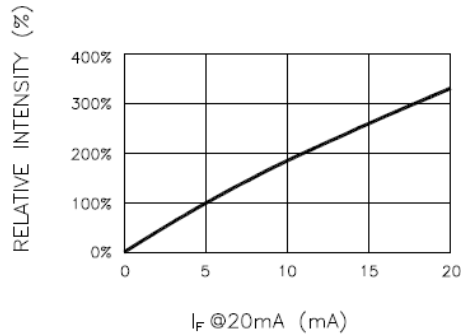


Fig.1 RELATIVE INTENSITY VS. FORWARD CURRENT

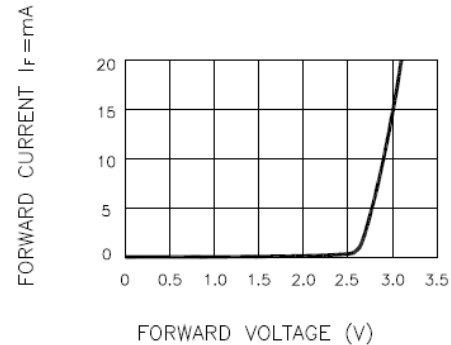


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

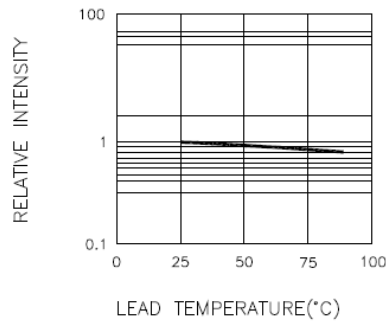


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE
(PULSED 20 mA; 300us PULSE, 10ms PERIOD)

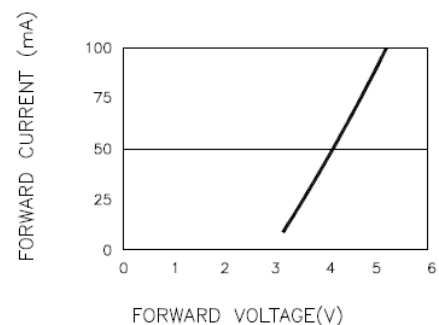


Fig.4 PEAK FORWARD VOLTAGE VS. FORWARD
(100us TEST PULSE, 1% DUTY CYCLE)

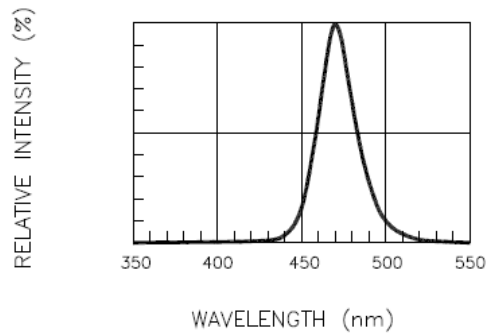


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

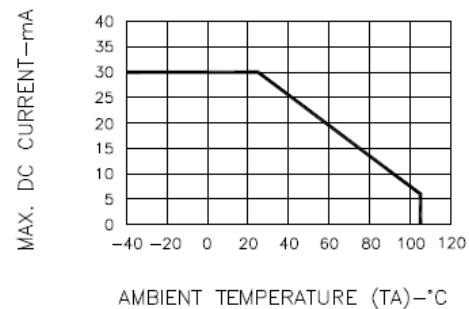
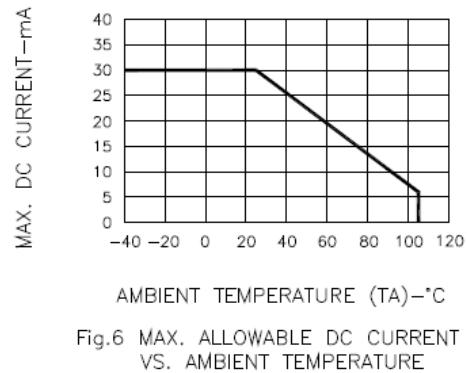
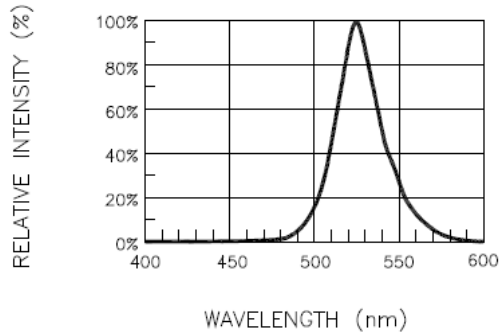
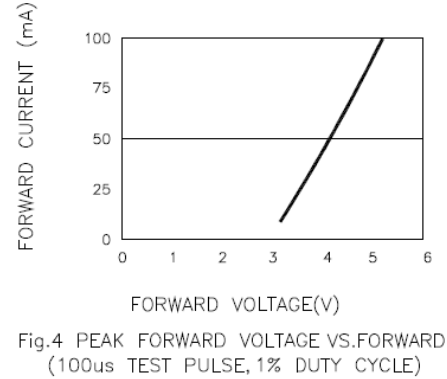
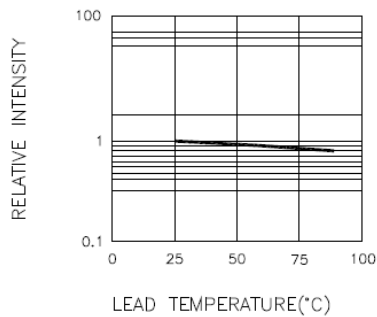
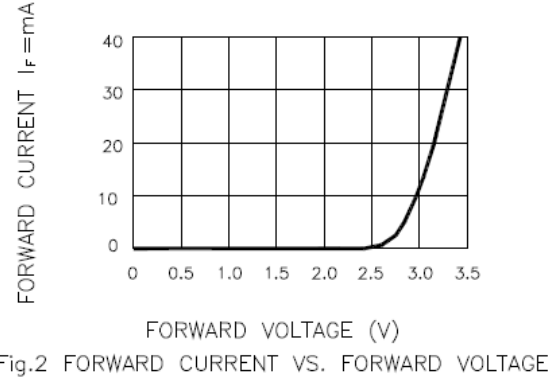
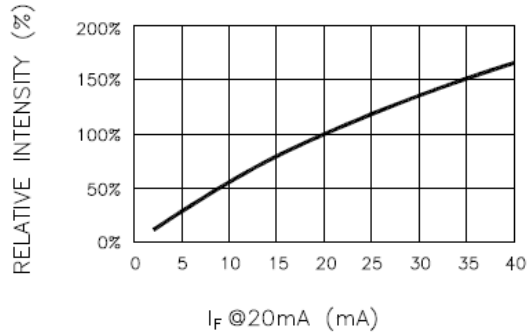


Fig.6 MAX. ALLOWABLE DC CURRENT
VS. AMBIENT TEMPERATURE

Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	May 14, 2013	Version of 1.0	Page 10/18

Characteristic Curves for TG



Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 11/18

Characteristic Curves for UYG

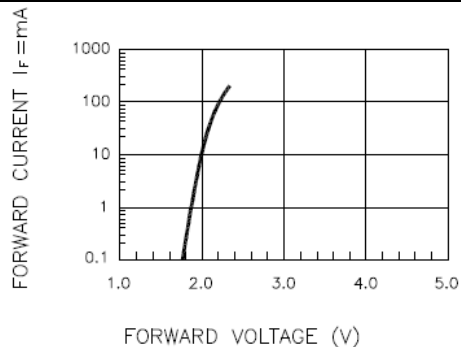


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

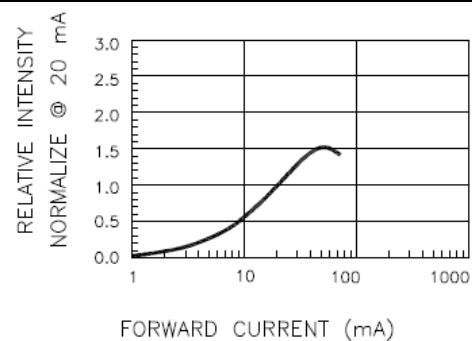


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

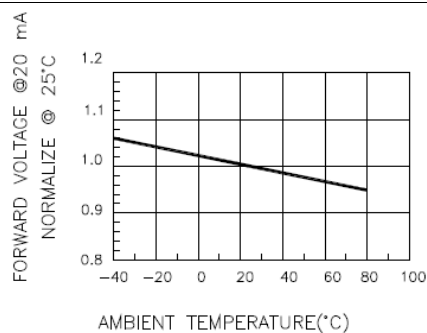


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

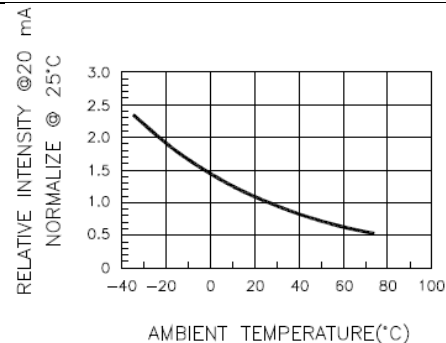


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

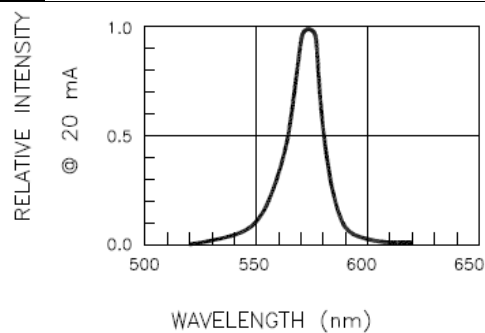


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

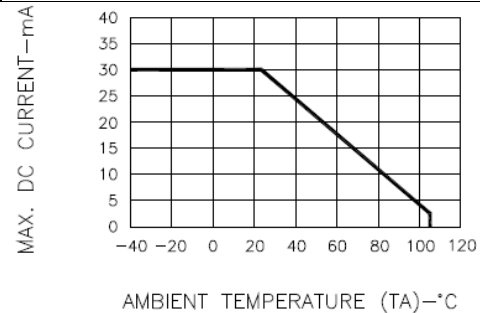


Fig.6 MAX. ALLOWABLE DC CURRENT
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Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 12/18

Characteristic Curves for UY

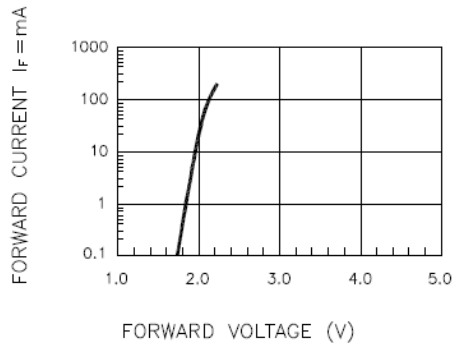


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

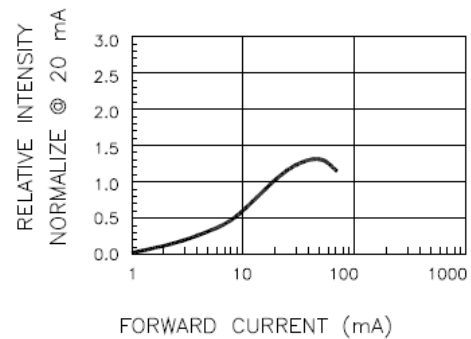


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

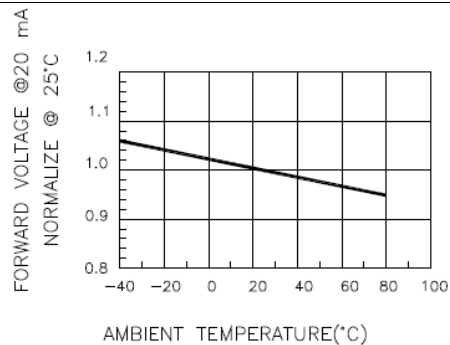


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

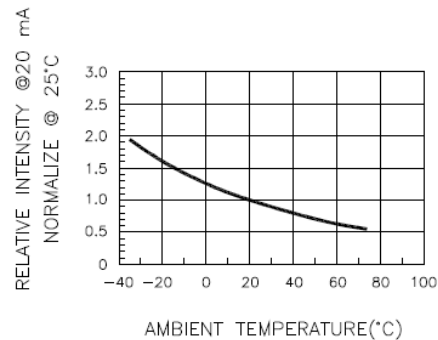


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

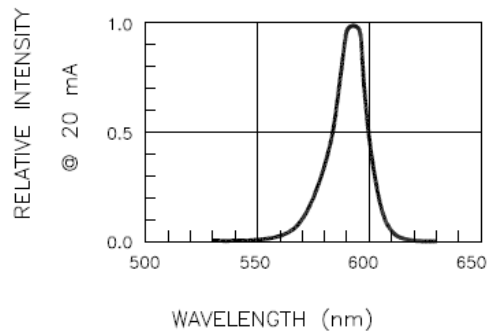


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

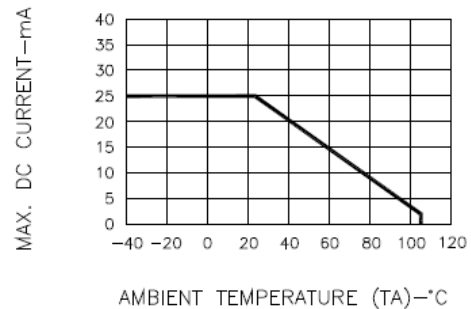


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	May 14, 2013	Version of 1.0	Page 13/18

Characteristic Curves for UA

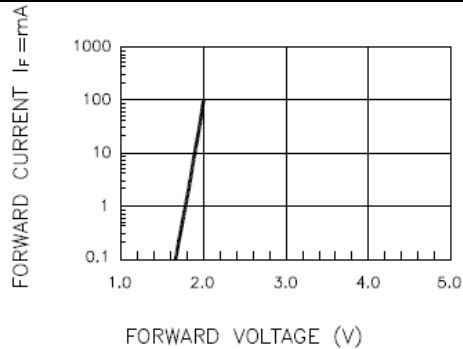


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

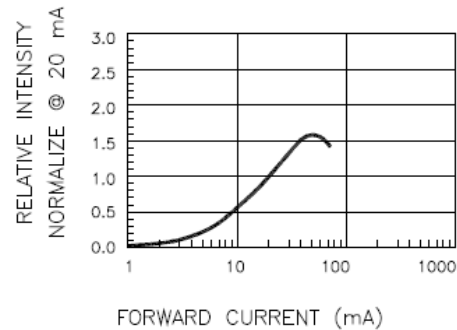


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

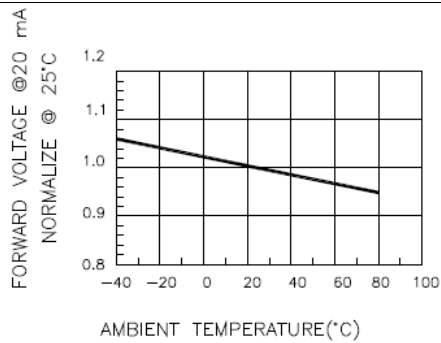


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

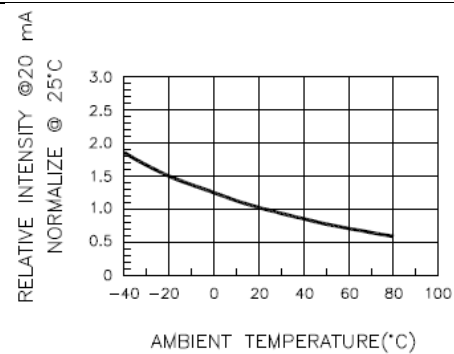


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

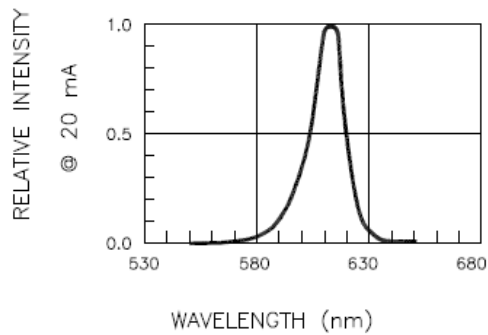


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

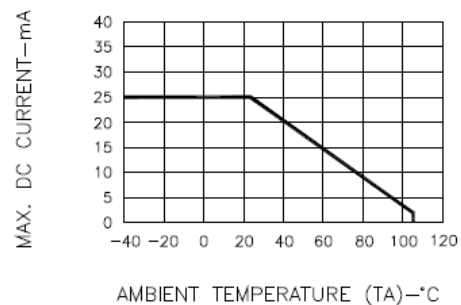


Fig.6 MAX. ALLOWABLE DC CURRENT
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Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 14/18

Characteristic Curves for UR

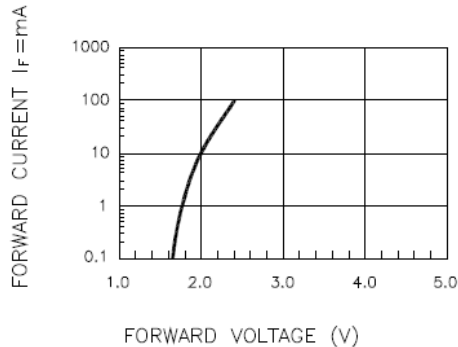


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

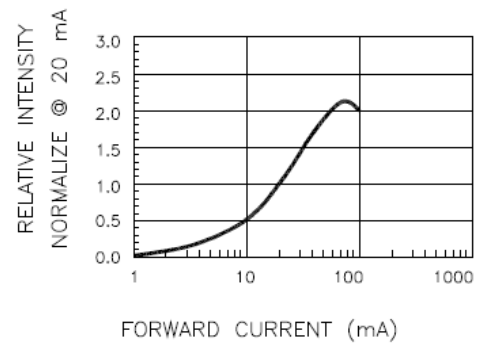


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

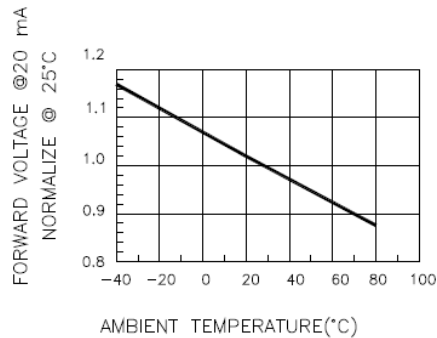


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

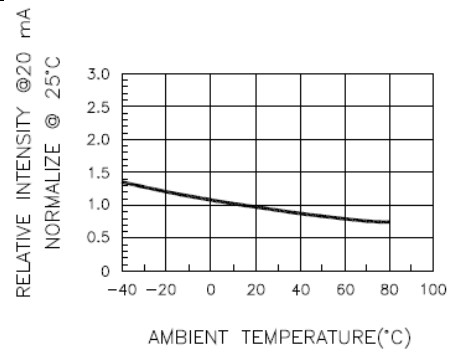


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

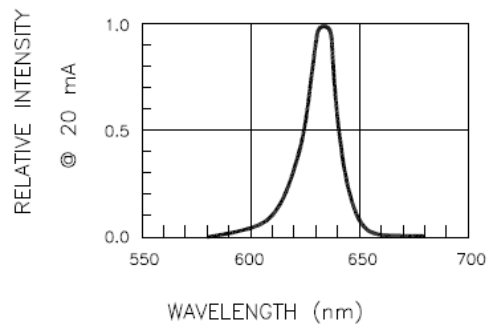


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

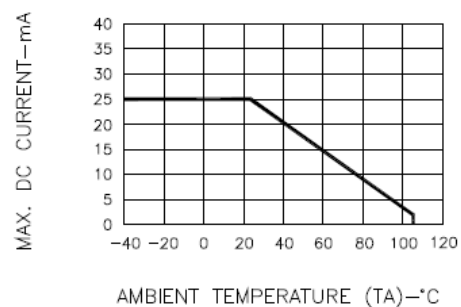


Fig.6 MAX. ALLOWABLE DC CURRENT
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Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 15/18

Characteristic Curves for USR

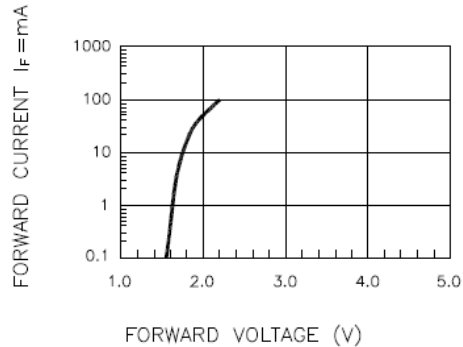


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

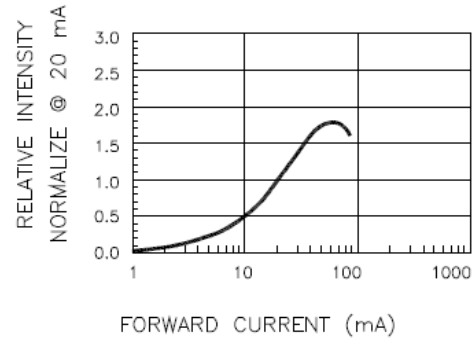


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

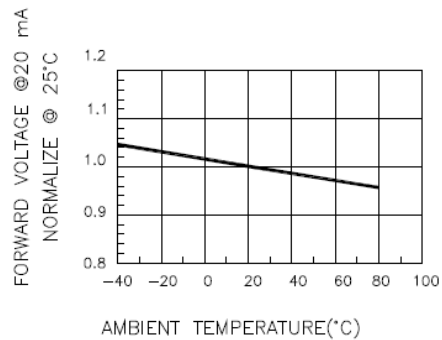


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

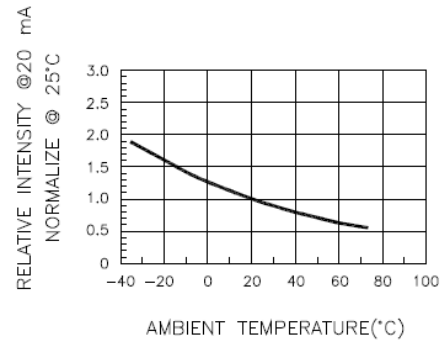


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

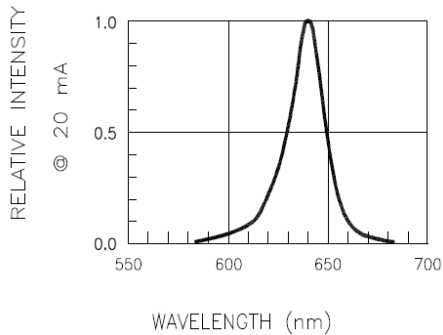


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

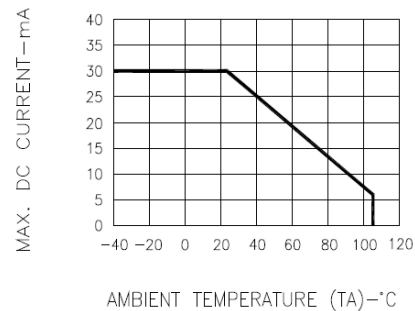
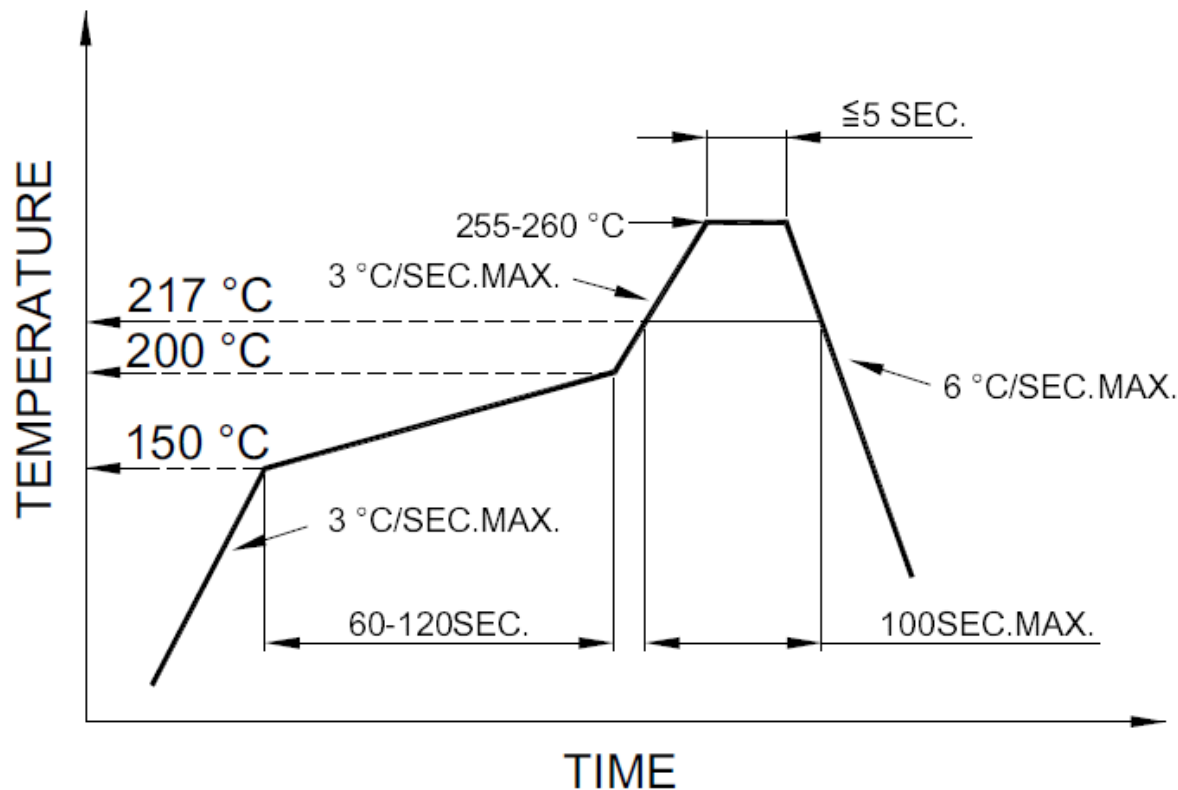


Fig.6 MAX. ALLOWABLE DC CURRENT
VS. AMBIENT TEMPERATURE

Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 16/18

Reflow Soldering



Pb Free Reflow Soldering Profile

Soldering Iron

Basic Spec is $\leq 4 \text{ sec.}$ when 260°C (+10°C $\rightarrow$ -1 second). Power dissipation of Iron should be less than 15W. Surface temperature should be under 230°C

Rework

Rework should be completed within 3 second under 350°C

Official Product	HNSD28 Series	Customer Part No.		Data Sheet No.
	*****	*****		HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0	Page 17/18

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release for HNSD28		1.0	05-13-2013

Official Product	HNSD28 Series	Customer Part No.	Data Sheet No.
	*****	*****	HNSD28 Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		May 14, 2013	Version of 1.0
			Page 18/18