

# Harvatek Surface Mount Chip LED Data Sheet HT-T169DNC

Official Product	Product: HT-T169DNC	Data Sheet No.		
Tentative Product	****	HT-T169DNC		
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 25, 2013	Version of 1.0	Page 1/17

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#### DISCLAIMER

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# LIFE SUPPORT POLICY

HARVATEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of HARVATEK or HARVATEK INTERNATIONAL. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.

2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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#### **Product Specifications**

	Specification	Material	Quantity
lv	2125-2850mcd		
	@20mA / Ta=25 <sup>0</sup> C, <u>+</u> 10%		
XY	Refer to page 8		
	@20mA / Ta=25 <sup>0</sup> C, <u>+</u> 0.01		
Vf	3.4V max		
	@20mA / Ta=25℃, <u>+</u> 0.05 V		
lr	< 100 µA @ V <sub>R</sub> = 5 V		
Resin	Yellow	Epoxy Resin	
Carrier tape	Per EIA 481-1A specs	Conductive black tape	2000pcs per reel
Reel	Per EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	

Others:

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv,  $\lambda_D$  and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

## ATTENTION: Electrostatic Discharge (ESD) protection



The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and

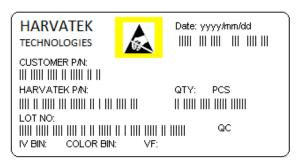
InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

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## **Label Specifications**



#### Harvatek P/N:

# H T - T 1 6 9 D N C - Y Y Y Y

$\downarrow$	$\checkmark$
Emitting Color	Customer Code
DNC	ΥΥΥΥ
CRI>70	Customer Product Code
	(TBD)
	DNC

#### Lot No.:

1 2	3	4	5	6	7	8	9	10
E 1	Α	1	Α	2	2	L	1	2
Code 1 2	Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10
	Mfg. Year	Mfg. Month	Mfg. Date	Consecuti	ve number		Special code	
Internal Tracing Code	2010-A 2011-B 2012-C 2013-D	1:Jan. 2:Feb.  A:Oct. B:Nov. C:Dec.	1:A 2:B 3:C 26:Z 27:7 28:8 29:9 30:3 31:4	01-	-72		000~ZZZ	

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# Luminous Intensity (Iv) Bin:

Bin	Luminous Intensity Range (mcd				
Biii	Minimum	Maximum			
Z62	2125	2250			
Z71	2250	2385			
Z72	2385	2530			
Z81	2530	2685			
Z82	2685	2850			

@20mA / Ta=25<sup>°</sup> C, Tolerance: <u>+</u> 10%

# Forward Voltage (V<sub>F</sub>) Bin:

Color	Bin Code	Spec. Range
	H2	2.9 – 3.0V
	H3	3.0 – 3.1V
White (TW)	H4	3.1 – 3.2V
	J1	3.2 – 3.3V
	J2	3.3 – 3.4V

@20mA / Ta=25 $^{\circ}$ C , Tolerance: <u>+</u> 0.05 V

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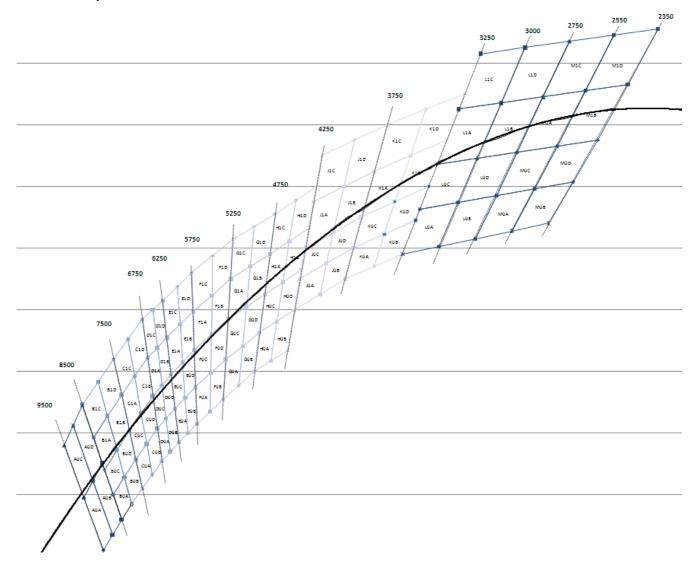
x         y         x	COA	1000-10001	ICIA .	1000-1300K	600	0100-10001	CID	0130-1000K	000	1000-13001	010	1000-1300K	000	Orau-ruuun	ICID .	0100-10000	
0.2035         0.2015         0.228         0.207625         0.2016         0.2285         0.201         0.2111         0.2285         0.2014         0.2015         0.2016         0.2016         0.2016         0.2016         0.2016<	×	у	x	у		7				y y		у		1		У	
0.30725         0.303         0.3285         0.3175         0.318         0.3085         0.3085         0.3085         0.3185         0.3085         0.3185         0.3085         0.3185         0.3175         0.3115         0.3387         0.3285         0.3085         0.3115         0.3115         0.3385         0.3385         0.3085         0.30115         0.3115         0.3385         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3285         0.3015         0.3115         0.3015         0.3125         0.3285         0.3015         0.3115         0.3017         0.3017         0.3017         0.3316         0.3255         0.31175						0.2965	0.3055		0.3035	0.3015			0.307625	0.3065		0.3285	
0.3955         0.2965         0.3965         0.3155         0.311         0.311         0.3115         0.3111         0.3115         0.3116         0.3115         0.3116         0.3115         0.3116         0.3115         0.3116         0.31115         0.3116 </td <td>0.3035</td> <td>0.3015</td> <td>0.298</td> <td>0.3225</td> <td>0.307625</td> <td>0.3065</td> <td>0.303</td> <td>0.3285</td> <td>0.301</td> <td>0.311</td> <td>0.295</td> <td>0.334</td> <td>0.3055</td> <td>0.3165</td> <td>0.3005</td> <td>0.3405</td> <td></td>	0.3035	0.3015	0.298	0.3225	0.307625	0.3065	0.303	0.3285	0.301	0.311	0.295	0.334	0.3055	0.3165	0.3005	0.3405	
0.306         0.292         0.301         0.311         0.30975         0.2965         0.3165         0.306         0.315         0.288         0.3225         0.307625         0.3065         0.303         0.3285         //ite           0.0         8500-8750K         D1A         8500-8750K         D0A         8250-850K         D1C         8500-8750K         D10         8250-850K         D10         3147         0.31175         0.3147         0.31175         0.3147         0.31175         0.3147         0.31175         0.3147         0.31175         0.31175         0.31175         0.31175         0.3117         0.3225         0.317         0.3225         0.317         0.3225         0.3117         0.3216         0.3117         0.3226         0.3117         0.3116         0.3116         0.3116         0.3117         0.3217         0.3216         0.3116	0.307625			0.3285	0.31175	0.3115	0.308	0.3345	0.3055	0.3165	0.3005	0.3405	0.31	0.322	0.306	0.347	
DA         6500-6750K         D1A         6500-6750K         D00         6250-6500K         D10         6250-6500K         D117         0.317         0.318         0.3125         0.325         0.31         0.325         0.31         0.325         0.317         0.335         0.317         0.336         0.3175         0.318         0.3175         0.318         0.3175         0.317         0.33775         0.318         0.3175         0.317         0.33775         0.318         0.3176         0.33775         0.318         0.3176         0.33775         0.318         0.3175         0	0.30975	0.2965	0.3055	0.3165	0.3135	0.301	0.31	0.322	0.307625	0.3065	0.303	0.3285	0.31175	0.3115	0.308	0.3345	
DDA         6500-6750K         D1A         6500-6750K         D1A         6500-6750K         D1A         6500-6750K         D1D         6250-6500K         D1D         6250-650K         D1D         570-60	0.306	0.292	0.301	0.311	0.30975	0.2965	0.3055	0.3165	0.3035	0.3015	0.298	0.3225	0.307625	0.3065	0.303	0.3285	/hita
x         y         x																	inte
0.3135         0.301         0.322         0.367         0.304         0.3135         0.3175         0.3115         0.306         0.3345         0.31475         0.3185         0.3175         0.3185	D0A	6500~6750K	D1A	6500~6750K	DOB	6250~6500K	D1B	6250~6500K	DOC	6500~6750K	D1C	6500~6750K	DOD	6250~6500K	D1D	6250~6500K	DNC
0.31175         0.3145         0.3145         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.31475         0.3145         0.3255         0.31         0.355         0.317         0.3226         0.314         0.335           0.3167         0.3225         0.32         0.307         0.325         0.31475         0.31475         0.3145         0.31475         0.3141         0.3225         0.3245<	×	У	X	У	х	У	X	У	х	У	X	У	х	У	х	У	
0.3141         0.3175         0.3185         0.3175         0.3175         0.3175         0.3185         0.3175         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3175         0.3185         0.3141         0.3225         0.3175         0.3185         0.3141         0.3225         0.3175         0.3185         0.3141         0.3225         0.3175         0.3185         0.3141         0.3225         0.3215         0.3225         0.3215         0.3325         0.3125         0.3325         0.3325         0.3125         0.3326         0.3225         0.317         0.3225         0.316         0.3165         0.3216         0.3225         0.3225 <td>0.3135</td> <td>0.301</td> <td>0.31</td> <td>0.322</td> <td>0.3167</td> <td>0.304</td> <td>0.3135</td> <td>0.3255</td> <td>0.31175</td> <td>0.3115</td> <td>0.308</td> <td>0.3345</td> <td>0.3151</td> <td>0.31475</td> <td>0.31175</td> <td>0.33775</td> <td></td>	0.3135	0.301	0.31	0.322	0.3167	0.304	0.3135	0.3255	0.31175	0.3115	0.308	0.3345	0.3151	0.31475	0.31175	0.33775	
0.3167         0.304         0.315         0.3225         0.327         0.3175         0.31175         0.31175         0.31175         0.3135         0.3185         0.3185         0.3185         0.3185         0.3185         0.3185         0.3185         0.3175         0.31175         0.3215         0.3215         0.3215         0.3215         0.3215         0.3215         0.3215         0.3215         0.3215         0.33175         0.33175         0.33175         0.3316         0	0.31175	0.3115	0.308	0.3345	0.3151	0.31475	0.31175	0.33775	0.31	0.322	0.306	0.347	0.3135	0.3255	0.31	0.35	1
0.3135         0.301         0.31         0.322         0.3187         0.304         0.3135         0.3255         0.31175         0.3115         0.308         0.3345         0.31475         0.31775           0.307         0.317         0.329         0.3215         0.3215         0.3215         0.3215         0.331         0.3185         0.3141         0.3225         0.3215         0.3325         0.3215         0.3205         0.3215         0.3325         0.3215         0.3225         0.3255         0.3255         0.3215         0.3225         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255         0.3255 <td>0.3151</td> <td>0.31475</td> <td>0.31175</td> <td>0.33775</td> <td>0.3185</td> <td>0.318</td> <td>0.3155</td> <td>0.341</td> <td>0.3135</td> <td>0.3255</td> <td>0.31</td> <td>0.35</td> <td>0.317</td> <td>0.329</td> <td>0.314</td> <td>0.353</td> <td>1</td>	0.3151	0.31475	0.31175	0.33775	0.3185	0.318	0.3155	0.341	0.3135	0.3255	0.31	0.35	0.317	0.329	0.314	0.353	1
EDA         600K-6250K         E1A         600K-6250K         E1A         600K-6250K         E1C         600K-6250K         E1C         600K-6250K         E1D         5750-6000K           x         y	0.3167	0.304	0.3135	0.3255	0.32	0.307	0.317	0.329	0.3151	0.31475	0.31175	0.33775	0.3185	0.318	0.3155	0.341	]
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	0.3135	0.301	0.31	0.322	0.3167	0.304	0.3135	0.3255	0.31175	0.3115	0.308	0.3345	0.3151	0.31475	0.31175	0.33775	]
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$																	
0.32         0.307         0.317         0.328         0.3215         0.3318         0.3185         0.3141         0.3225         0.3215         0.3205         0.3411         0.3225         0.3215         0.3205         0.34525           0.3165         0.318         0.3155         0.3241         0.3225         0.3215         0.3205         0.34525         0.3205         0.3245         0.3205         0.3225	E0A	6000K~6250K	E1A	6000K~6250K	EOB	5750~6000K	E1B	5750~6000K	EOC	6000K~6250K	E1C	6000K~6250K	EOD	5750~6000K	E1D	5750~6000K	1
0.318         0.318         0.3185         0.314         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225         0.3215         0.3225 <th>×</th> <th>У</th> <th>х</th> <th>У</th> <th>1</th>	×	У	х	У	х	У	х	у	х	У	х	у	х	У	х	У	1
0.3225         0.3215         0.3205         0.3265         0.3255         0.3295         0.3215         0.3331         0.3195         0.3575         0.326         0.337         0.325         0.326           0.3236         0.31         0.3215         0.332         0.327         0.311         0.326         0.327         0.313         0.326         0.3215         0.3225         0.3215         0.3225         0.3225         0.3225         0.3225         0.3225         0.3225         0.3225         0.3265         0.3265         0.3265         0.3265         0.3265         0.3265         0.3265         0.3265         0.3275         0.3265         0.3275         0.3265         0.3275         0.3265         0.3275         0.3265         0.3275         0.34525           x         y	0.32	0.307	0.317	0.329	0.3235	0.31	0.3215	0.333	0.3185	0.318	0.3155	0.341	0.3225	0.3215	0.3205	0.34525	1
0.3235         0.31         0.3215         0.333         0.327         0.313         0.328         0.337         0.3225         0.3215         0.3205         0.34525         0.3265         0.3255         0.3265         0.3275         0.3265         0.3265         0.3275         0.3275         0.332         0.332         0.3325         0.342         0.3327         0.332         0.3275         0.3265         0.33275         0.3325         0.3225         0.3225         0.3225         0.3225         0.3225         0.3225         0.3327         0.333         0.337         0.3225         0.3325         0.3327         0.332         0.337         0.3225         0.3325         0.3327         0.333         0.337         0.3225         0.3327         0.333         0.337         0.3325         0.342         0.3327         0.3325         0.3327         0	0.3185	0.318	0.3155	0.341	0.3225	0.3215	0.3205	0.34525	0.317	0.329	0.314	0.353	0.3215	0.333	0.3195	0.3575	1
0.32         0.317         0.329         0.3235         0.31         0.3215         0.333         0.3185         0.318         0.3155         0.341         0.3225         0.3215         0.3205         0.3425           F0A         5500-5750K         F1A         5500-5750K         F0B         5250-5500K         F1B         5250-5500K         F0C         5500-5750K         F1C         5500-5750K         F0D         5250-5500K         F1D         5250-5500K           x         y	0.3225	0.3215	0.3205	0.34525	0.3265	0.325	0.3255	0.3495	0.3215	0.333	0.3195	0.3575	0.326	0.337	0.325	0.362	1
F0A         5500-5750K         F1A         5500-5750K         F1A         5500-5750K         F1B         5250-5500K         F1C         5500-5750K         FDD         5250-550K         S00         520-550K         S00         F1C         5500-5750K         FDD         5250-550K         S00         F1C         5500-5750K         FDD         5250-550K         S00         F1C         5500-5750K         S00         5250         500         5250         5003255         5003255         50032	0.3235	0.31	0.3215	0.333	0.327	0.313	0.326	0.337	0.3225	0.3215	0.3205	0.34525	0.3265	0.325	0.3255	0.3495	1
x         y         x	0.32	0.307	0.317	0.329	0.3235	0.31	0.3215	0.333	0.3185	0.318	0.3155	0.341	0.3225	0.3215	0.3205	0.34525	1
x         y         x																	
0.327         0.313         0.326         0.337         0.332         0.317         0.3325         0.342         0.325         0.3255         0.3495         0.33275         0.32475           0.3265         0.3255         0.3495         0.33225         0.3295         0.3295         0.33275         0.3475           0.3266         0.3255         0.3495         0.33275         0.3475         0.3265         0.332         0.33275         0.3475           0.3325         0.3495         0.33275         0.344         0.36         0.332         0.347         0.332         0.347         0.332         0.347         0.332         0.347         0.332         0.347         0.332         0.347         0.341         0.373           0.332         0.317         0.332         0.317         0.3325         0.342         0.332         0.347         0.341         0.373           0.332         0.317         0.332         0.317         0.3325         0.342         0.3255         0.3295         0.3295         0.334         0.34         0.36           0.332         0.317         0.332         0.317         0.3325         0.3425         0.3255         0.3495         0.33275         0.3475	F0A	5500~5750K	F1A	5500~5750K	F0B	5250~5500K	F1B	5250~5500K	FOC	5500~5750K	F1C	5500~5750K	FOD	5250~5500K	F1D	5250~5500K	1
0.3265         0.3255         0.3255         0.33225         0.33225         0.33225         0.3327         0.332         0.337         0.332         0.337         0.332         0.337         0.332         0.3327         0.3325         0.3265         0.3265         0.3265         0.3265         0.3265         0.3275         0.3325         0.33275         0.33275         0.33275         0.33275         0.3367         0.336         0.337         0.326         0.3265         0.3265         0.3265         0.3265 <td>x</td> <td>У</td> <td>х</td> <td>У</td> <td>ï</td>	x	У	x	у	x	у	x	у	x	У	x	У	x	У	х	У	ï
0.33225         0.3295         0.33275         0.35475         0.338         0.334         0.34         0.36         0.3325         0.332         0.337         0.332	0.327	0.313	0.326	0.337	0.332	0.317	0.3325	0.342	0.3265	0.325	0.3255	0.3495	0.33225	0.3295	0.33275	0.35475	1
0.332         0.317         0.3325         0.342         0.337         0.321         0.339         0.347         0.3325         0.3295         0.33275         0.35475         0.338         0.334         0.34         0.36           0.327         0.313         0.326         0.337         0.332         0.317         0.3325         0.3295         0.3275         0.35475         0.338         0.334         0.34         0.36           G0A         5000K-5250K         G1A         5000K-5250K         G0B         4750-5000K         G1B         4750-5000K         G0C         5000K-5250K         G1C         5000K-5250K         G1D         4750-5000K         G1D	0.3265	0.325	0.3255	0.3495	0.33225	0.3295	0.33275	0.35475	0.326	0.337	0.325	0.362	0.3325	0.342	0.333	0.3675	1
0.327         0.313         0.326         0.337         0.332         0.317         0.3325         0.342         0.325         0.325         0.3495         0.33225         0.3295         0.33275         0.33275         0.35475           G0A         5000K-5250K         G1A         5000K-5250K         G0B         4750-5000K         G1B         4750-5000K         G0C         5000K-5250K         G1C         5000K-5250K         G0D         4750-5000K         G1D         4750-500K         G1D	0.33225	0.3295	0.33275	0.35475	0.338	0.334	0.34	0.36	0.3325	0.342	0.333	0.3675	0.339	0.347	0.341	0.373	]
GOA         5000K-5250K         GIA         5000K-5250K         GIB         4750-5000K         GIB         4750-5000K         GIC         5000K-5250K         GID         4750-5000K         GID         4750-5000K           x         y <td>0.332</td> <td>0.317</td> <td>0.3325</td> <td>0.342</td> <td>0.337</td> <td>0.321</td> <td>0.339</td> <td>0.347</td> <td>0.33225</td> <td>0.3295</td> <td>0.33275</td> <td>0.35475</td> <td>0.338</td> <td>0.334</td> <td>0.34</td> <td>0.36</td> <td>]</td>	0.332	0.317	0.3325	0.342	0.337	0.321	0.339	0.347	0.33225	0.3295	0.33275	0.35475	0.338	0.334	0.34	0.36	]
x         y         x	0.327	0.313	0.326	0.337	0.332	0.317	0.3325	0.342	0.3265	0.325	0.3255	0.3495	0.33225	0.3295	0.33275	0.35475	]
x         y         x																	
0.337         0.321         0.339         0.347         0.343         0.3255         0.348         0.351         0.338         0.334         0.34         0.368         0.3445         0.33825         0.3475         0.364           0.338         0.334         0.34         0.36         0.3445         0.33825         0.3475         0.364         0.338         0.347         0.341         0.373         0.346         0.351         0.3475         0.364           0.338         0.3342         0.347         0.341         0.373         0.346         0.351         0.3475         0.364           0.3445         0.33625         0.3475         0.364         0.351         0.3425         0.367         0.361         0.377           0.3445         0.33625         0.3475         0.364         0.351         0.3425         0.377         0.353         0.355         0.368           0.3445         0.33625         0.3475         0.364         0.351         0.3425         0.368         0.346         0.377         0.353         0.355         0.368           0.3445         0.33625         0.3475         0.368         0.3445         0.33825         0.3475         0.368         0.355         0.368	G0A	5000K~5250K	G1A	5000K~5250K	G0B	4750~5000K	G1B	4750~5000K	GOC	5000K~5250K	G1C	5000K~5250K	GOD	4750~5000K	G1D	4750~5000K	]
0.338         0.344         0.345         0.3325         0.347         0.341         0.373         0.346         0.351         0.349         0.377           0.3445         0.33825         0.3475         0.364         0.355         0.368         0.346         0.351         0.345         0.337         0.346         0.355         0.387           0.3445         0.33825         0.3475         0.364         0.351         0.3425         0.375         0.368         0.349         0.377         0.353         0.355         0.381           0.345         0.3255         0.346         0.351         0.3425         0.355         0.368         0.346         0.377         0.353         0.355         0.381           0.345         0.3255         0.346         0.351         0.3425         0.355         0.368         0.346         0.3255         0.346         0.351         0.3425         0.347         0.364         0.351         0.3425         0.345         0.346         0.351         0.3425         0.3455         0.368	x	У	х	У	х	У	х	У	х	У	х	У	х	У	х	у	]
0.3445         0.33825         0.3475         0.364         0.351         0.3425         0.355         0.368         0.346         0.351         0.349         0.377         0.353         0.355         0.381           0.343         0.3255         0.346         0.351         0.349         0.355         0.364         0.351         0.355         0.381	0.337	0.321	0.339	0.347	0.343	0.3255	0.346	0.351	0.338	0.334	0.34	0.36	0.3445	0.33825	0.3475	0.364	]
0.343 0.3255 0.346 0.351 0.349 0.33 0.353 0.355 0.3445 0.33825 0.3475 0.364 0.351 0.3425 0.3425 0.368	0.338	0.334	0.34	0.36	0.3445	0.33825	0.3475	0.364	0.339	0.347	0.341	0.373	0.346	0.351	0.349	0.377	]
	0.3445	0.33825	0.3475	0.364	0.351	0.3425	0.355	0.368	0.346	0.351	0.349	0.377	0.353	0.355	0.357	0.381	]
0.337 0.321 0.339 0.347 0.343 0.3255 0.346 0.351 0.338 0.334 0.34 0.36 0.3445 0.33825 0.3475 0.364	0.343	0.3255	0.346	0.351	0.349	0.33	0.353	0.355	0.3445	0.33825	0.3475	0.364	0.351	0.3425	0.355	0.368	]
	0.337	0.321	0.339	0.347	0.343	0.3255	0.346	0.351	0.338	0.334	0.34	0.36	0.3445	0.33825	0.3475	0.364	1

HOA	4500~4750K	H1A	4500~4750K	HOB	4250~4500K	H1B	4250~4500K	HOC	4500~4750K	H1C	4500~4750K	HOD	4250~4500K	H1D	4250~4500K
x	v	X	v	X	v	X	v	X	v	X	v	X	v	X	v
0.349	0.33	0.353	0.355	0.3555	0.3335	0.36	0.359	0.351	0.3425	0.355	0.368	0.35775	0.34625	0.3625	0.37225
0.351	0.3425	0.355	0.368	0.35775	0.34625	0.3625	0.37225	0.353	0.355	0.357	0.381	0.36	0.359	0.365	0.3855
0.35775	0.34625	0.3625	0.37225	0.3645	0.35	0.37	0.3765	0.36	0.359	0.365	0.3855	0.367	0.363	0.373	0.39
0.3555	0.3335	0.36	0.359	0.362	0.337	0.367	0.363	0.35775	0.34625	0.3625	0.37225	0.3645	0.35	0.37	0.3765
0.349	0.33	0.353	0.355	0.3555	0.3335	0.36	0.359	0.351	0.3425	0.355	0.368	0.35775	0.34625	0.3625	0.37225
JOA	4000~4250K	J1A	4000~4250K	JOB	3750~4000K	J1B	3750~4000K	JOC	4000~4250K	J1C	4000~4250K	JOD	3750~4000K	J1D	3750~4000K
x	У	×	У	×	У	x	У	x	У	x	У	x	У	x	У
0.3645	0.35	0.3685	0.37	0.37425	0.355	0.37925	0.375	0.3665	0.36	0.37175	0.385	0.37675	0.365	0.383375	0.39
0.3665	0.36	0.37175	0.385	0.37675	0.365	0.383375	0.39	0.3685	0.37	0.375	0.4	0.37925	0.375	0.3875	0.405
0.37675	0.365	0.383375	0.39	0.387	0.37	0.395	0.395	0.37925	0.375	0.3875	0.405	0.39	0.38	0.4	0.41
0.37425	0.355	0.37925	0.375	0.384	0.36	0.39	0.38	0.37675	0.365	0.383375	0.39	0.387	0.37	0.395	0.395
0.3645	0.35	0.3685	0.37	0.37425	0.355	0.37925	0.375	0.3665	0.36	0.37175	0.385	0.37675	0.365	0.383375	0.39
K0A	3500~3750K	K1A	3500~3750K	K0B	3250~3500K	K1B	3250~3500K	KOC	3500~3750K	K1C	3500~3750K	K0D	3250~3500K	K1D	3250~3500K
х	У	x	У	x	У	х	У	х	У	X	У	х	У	х	У
0.384	0.36	0.39	0.38	0.395	0.364	0.403	0.385	0.387	0.37	0.395	0.395	0.399	0.3745	0.409	0.4
0.387	0.37	0.395	0.395	0.399	0.3745	0.409	0.4	0.39	0.38	0.4	0.41	0.403	0.385	0.415	0.415
0.399	0.3745	0.409	0.4	0.411	0.379	0.4228	0.4047	0.403	0.385	0.415	0.415	0.416	0.39	0.43	0.42
0.395	0.364	0.403	0.385	0.406	0.368	0.416	0.39	0.399	0.3745	0.409	0.4	0.411	0.379	0.423	0.405
0.384	0.36	0.39	0.38	0.395	0.364	0.403	0.385	0.387	0.37	0.395	0.395	0.399	0.3745	0.409	0.4
LOA	3000~3250K	LOB	2750~3000K	LOC	3000~3250K	LOD	2750~3000K	L1A	3000~3250K	L1B	2750~3250K	L1C	3000~3250K	L1D	2750~3000K
х	У	x	У	x	у	х	у	х	У	х	У	х	У	х	У
0.40600	0.368	0.42000	0.37050	0.41250	0.38250	0.42725	0.38475	0.419	0.397	0.4345	0.399	0.42750	0.41500	0.44375	0.417
0.41250	0.38250	0.42725	0.38475	0.41900	0.39700	0.4345	0.399	0.42750	0.41500	0.44375	0.41700	0.43600	0.43300	0.45300	0.43500
0.42725	0.38475	0.44200	0.38700	0.43450	0.39900	0.45	0.401	0.44375	0.41700	0.46000	0.41900	0.45300	0.43500	0.47000	0.43700
0.42000	0.37050	0.43400	0.37300	0.42725	0.38475	0.442	0.387	0.43450	0.39900	0.45000	0.40100	0.44375	0.41700	0.46000	0.41900
0.40600	0.368	0.42000	0.37050	0.41250	0.38250	0.42725	0.38475	0.419	0.397	0.4345	0.399	0.42750	0.41500	0.44375	0.417
MOA	2550~2750K	MOB	2350~2550K	MOC	2550~2750K	MOD	2350~2550K	M1A	2550~2750K	M1B	2350~2550K	M1C	2550~2750K	M1D	2350~2550K
x	у	×	У	x	у	x	У	x	У	x	У	x	У	x	У
0.434	0.373	0.448	0.3755	0.442	0.387	0.45675	0.38925	0.45	0.401	0.46550	0.40300	0.46000	0.41900	0.47625	0.421
0.44200	0.38700	0.45675	0.38925	0.45000	0.40100	0.46550	0.40300	0.46000	0.41900	0.47625	0.42100	0.47000	0.43700	0.48700	0.43900
0.45675	0.38925	0.47150	0.39150	0.46550	0.40300	0.48100	0.40500	0.47625	0.42100	0.49250	0.42300	0.48700	0.43900	0.50400	0.44100
0.44800	0.37550	0.46200	0.37800	0.45675	0.38925	0.47150	0.39150	0.46550	0.40300	0.48100	0.40500	0.47625	0.42100	0.49250	0.42300
0.434	0.373	0.448	0.3755	0.442	0.387	0.45675	0.38925	0.45	0.401	0.46550	0.40300	0.46000	0.41900	0.47625	0.421

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Tentative Product	HT-T169DNC			
Specifications are subjec drawings herein are copy	t to change without notice. Data and righted.	June 25, 2013	Version of 1.0	Page 7/17



# **Color Temperature Coordinates**



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Tentative Product	entative Product ***********					
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#### **Product Characteristics**

#### Absolute Maximum Ratings

Product	Emission Color	P <sub>d</sub> (mW)	I <sub>F</sub> (mA)	I <sub>FP</sub> * (mA)	Ir (μΑ) @ V <sub>R</sub> = 5 V	Top (°C)	Ts⊤ (°C)
HT-T169DNC	White	111	30	100	<1µA	-30°C~+80°C	-40°C~+85°C

\* Condition for  $I_{FP}$  is pulse of 1/10 duty and 0.1msec width

\*\*Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product,

such operation can cause migration resulting in LED damage.

#### Electro-Optical Characteristics

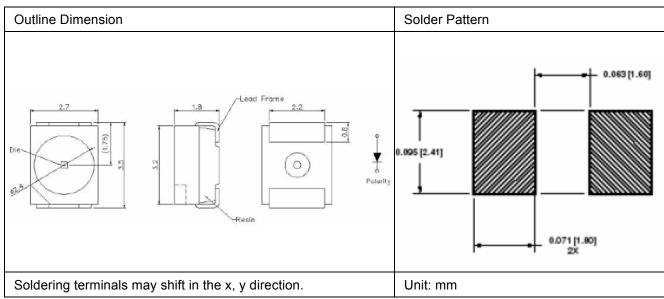
						(T <sub>a</sub> 25 ∘C)
Product	Emission	L (m A)	V <sub>F</sub> (V)		ССТ	I* <sub>∨</sub> (mcd)
	Color	l⊧(mA)	typ	max	Correlated Color Temperature(K)	typ
HT-T169DNC	IT-T169DNC White 20		2.9 3.4		2750 – 7500K typ.	2400

\* Per NIST standards

## Package Outline Dimension

#### **Recommended Soldering Pattern for Reflow Soldering**

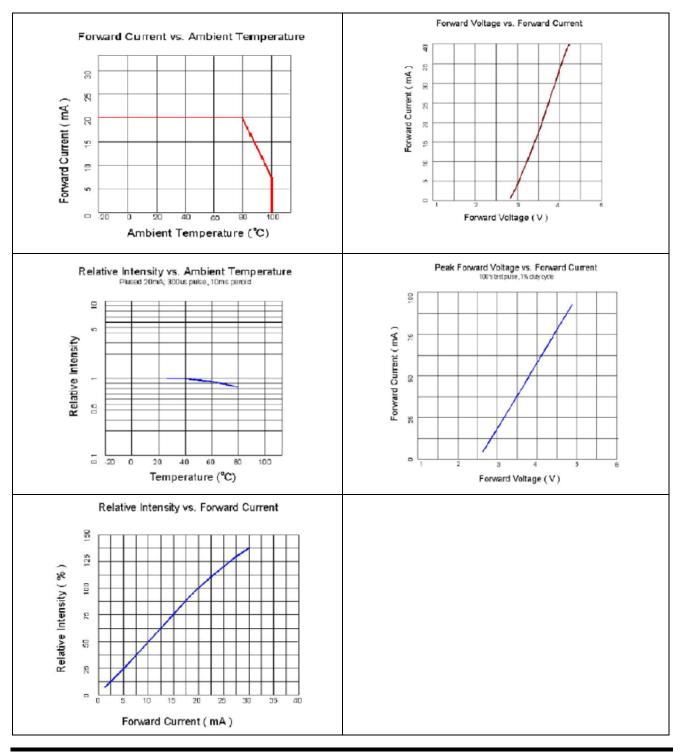
Unit: mm Tolerance: +/-0.1



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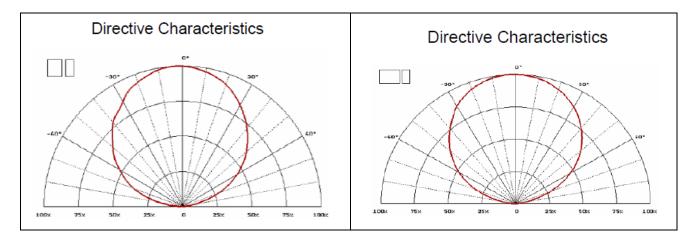


#### Characteristic Curves for TW



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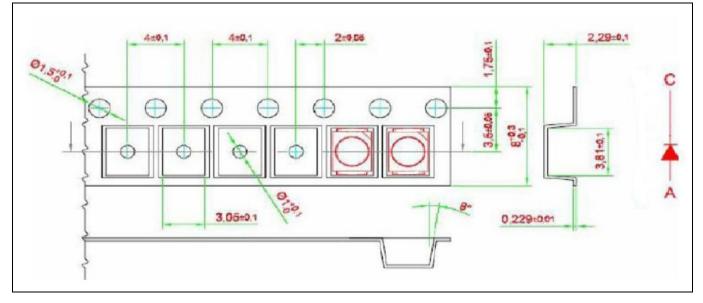


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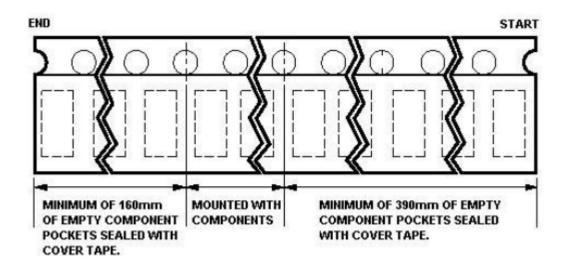
# Packaging

## **Tape Dimension**



Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-T169	3.73±0.10	2.95±0.10	2.12±0.10	2K

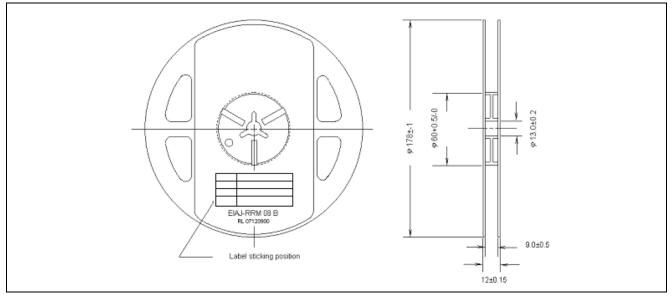
Unit: mm



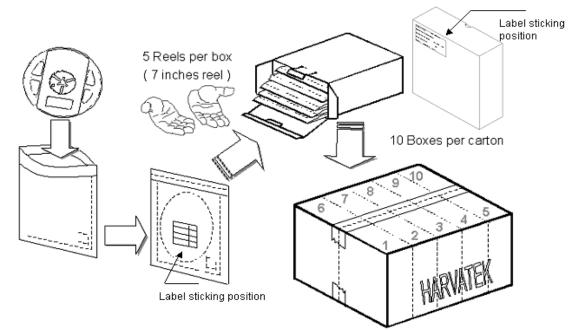
Official Product	Product: HT-T169DNC	Data Sheet No.		
Tentative Product	HT-T169DNC			
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# **Reel Dimension**



# Packing



5 boxes per carton is available depending on shipment quantity.

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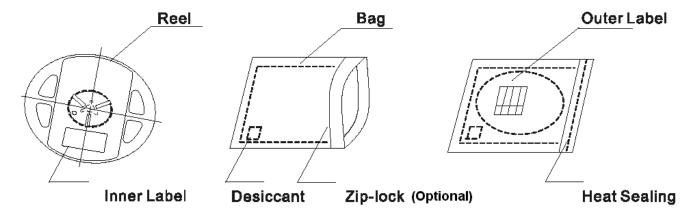


## **Dry Pack**

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



## PRECAUTIONS

- 1. Avoid exposure to moisture at all times during transportation or storage.
- 2. Anti-Static precaution must be taken when handling GaN, InGaN, and AllnGaP products.
- 3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage.
- 4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
- 5. Avoid direct contact with the surface through which the LED emits light.
- 6. If possible, assemble the unit in a clean room or dust-free environment.

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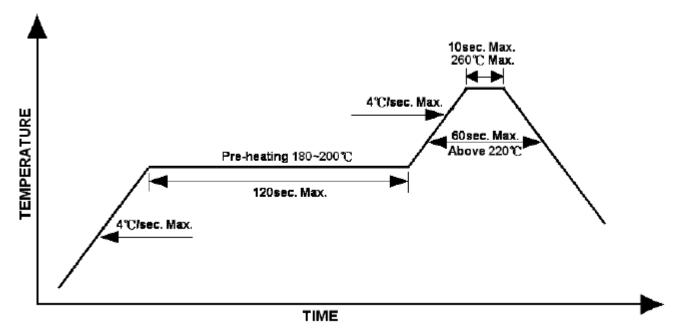


#### **Reflow Soldering**

Recommend soldering paste specifications:

- 1. Operating temp.: Above 220°C, 60 sec.
- 2. Peak temp.:260°C Max., 10sec Max.
- 3. Reflow soldering should not be done more than two times.
- 4. Never attempt next process until the component is cooled down to room temperature after reflow.
- 5. The recommended reflow soldering profile (measured on the surface of the LED terminal) is as following:

#### Lead-free Solder Profile



#### Reworking

- Rework should be completed within 5 seconds under 260 °C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

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## Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 <sup>o</sup>C max, <3min

# **Cautions of Pick and Place**

- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electro-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

## **Reliability Test**

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solder ability	1Q/ 1/ 22/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5 <u>+</u> 0.5cm/s Tinning: A: 215°C/ 3 <u>+</u> 1s or B: 260°C/ 10 <u>+</u> 1s
Resistance to soldering heat		CNS-5067	Dipping soldering terminal only Soldering bath temperature A: 260+/-5°C; 10+/-1s B: 350+/-10°C; 3+/-0.5s
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	<ol> <li>Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs</li> <li>T<sub>amb</sub>25°C; I<sub>F</sub>=20mA; duration 1000hrs</li> </ol>
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	T <sub>amb</sub> : 85°C Humidity: 85% R.H., I <sub>F</sub> =5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20/0	HT specs.	T <sub>amb</sub> : 55°C I <sub>F</sub> =20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		T <sub>amb</sub> 25°C, I <sub>r</sub> =20mA,, I <sub>p</sub> =100mA, Duty cycle=0.125 (tp=125µ s,T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 76/ 0	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min 300 cycles 2 chamber/ Air-to-air type
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60 <u>+</u> 3°C 90+5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100 <u>+</u> 10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40 <u>+</u> 5°C for 500hrs

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# **Revision History**

Changes since last revision	Page	Version No.	Revision Date
Initial release		1.0	06-25-2013

Official Product	Product: HT-T169DNC			Data Sheet No.
Tentative Product	******			HT-T169DNC
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