

# Relaxing Lighting Solution

Light for the Relaxing Moments

SAMSUNG



# Bright Light Disrupts Sleep

*“After bright light exposure, sleepiness levels were reduced at 20:30 and 22:00 h.*

*Controlled exposure to light during evening hours increased alertness”*



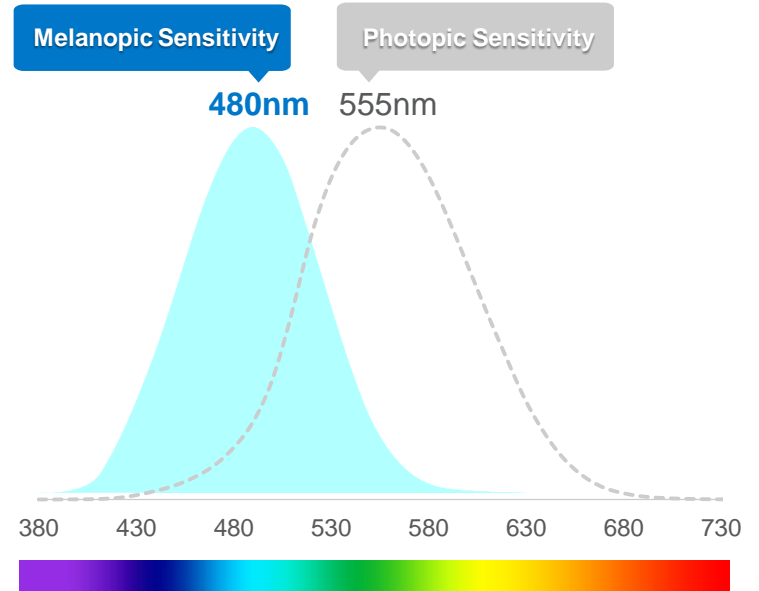
# Need to be Comfortable Even Under Bright Light

There are cases that people want to relax while doing activities that need proper illumination level, like reading.



# Short Wavelength Affects Alertness

*“When exposed to short wavelength, we had significantly lower subjective sleepiness ratings”*



# Key Considerations for Relaxing Lighting

## Stimulus

Relaxing spectrum that effectively accelerates melatonin secretion

## Balance

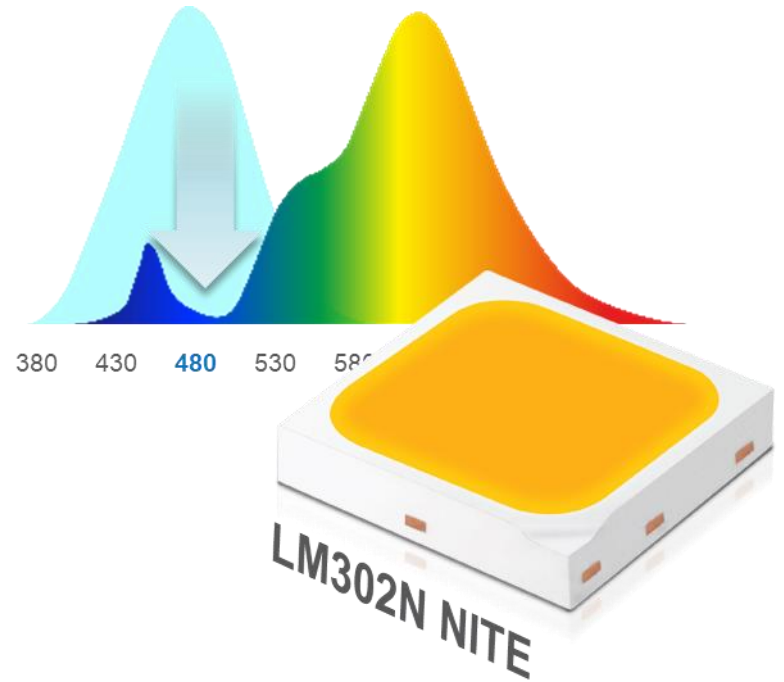
Minimizing loss of light efficacy while realizing relaxing effect

## Choice

Providing various CCT options from warm to cool white

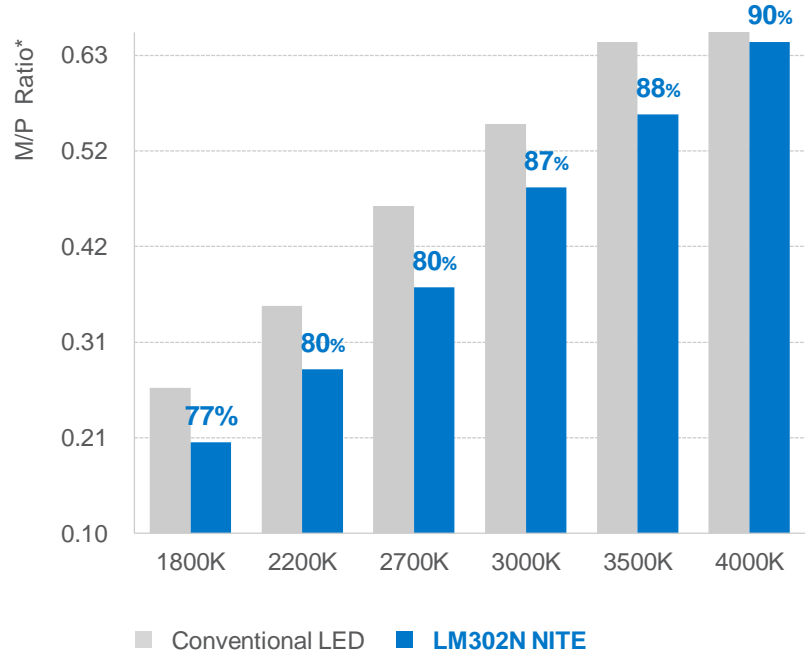
# Fine-Tuned Spectrum for More Relaxing Moments

Maximizing melatonin secretion with a decreased intensity of 480nm wavelength by directly controlling cyan, enables users to be more relaxed and sleep better



# LM302N NITE with Low M/P Ratio

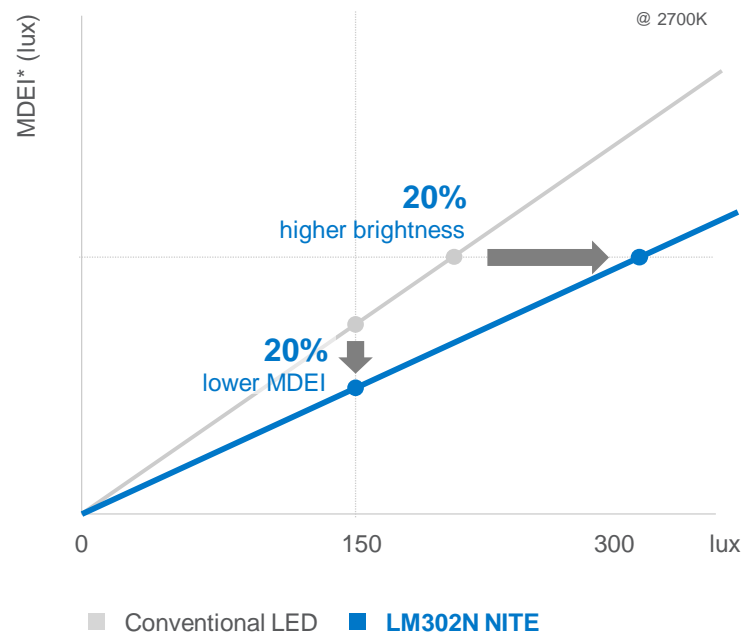
Samsung LM302N NITE  
with low M/P ratio enhances  
melatonin secretion levels compared  
to conventional LED lighting



\* M/P Ratio: Melanopic/Photopic Ratio

# LM302N NITE with Low MDEI

The lower M/P ratio, the lower MDEI and more relaxing effects even under the higher brightness



\* MDEI: Melanopic Daylight Equivalent Illuminance

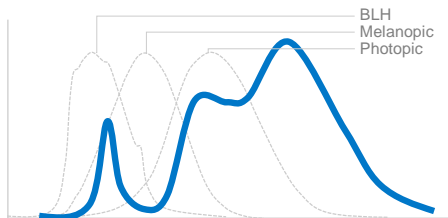


# LM302N NITE

Controlling direct-cyan realizes well balanced relaxing lighting solution

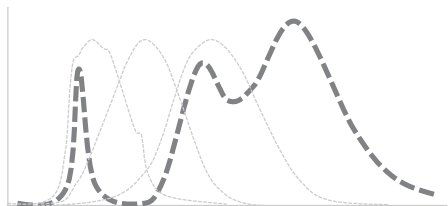
## LM302N NITE

Blue Chip + Narrow Green Phosphor  
(Cyan gap)



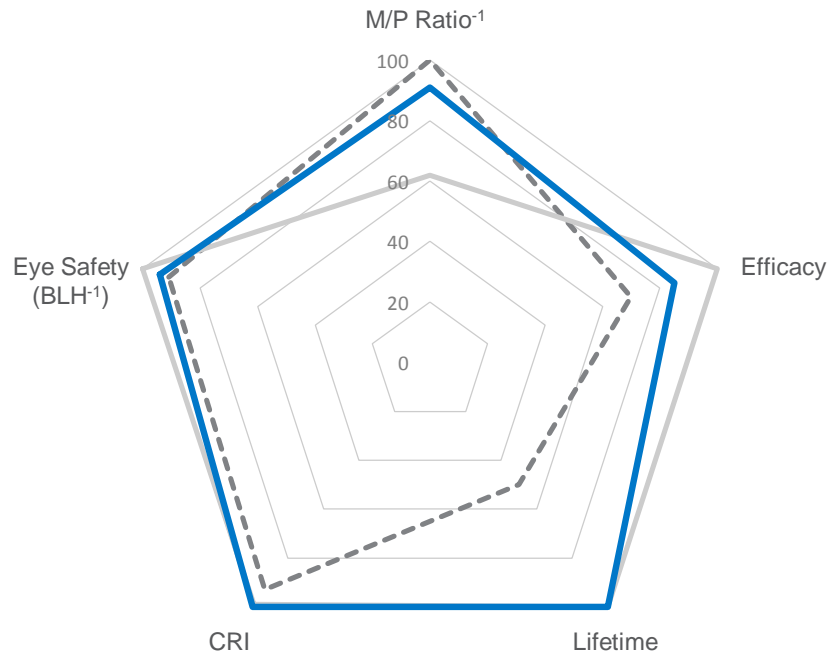
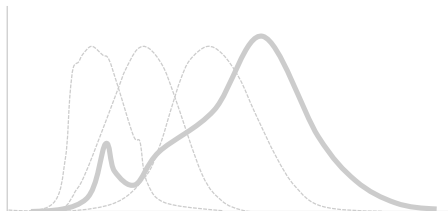
## Company C

nUV Chip + Narrow Green Phosphor  
(Cyan gap)



## Conventional LED

Conventional Warm White



# The Right Light for the Right Place

Various CCT options from 1800K to 4000K helps to create the perfect atmosphere while providing a relaxing effect

MDEI



CCT

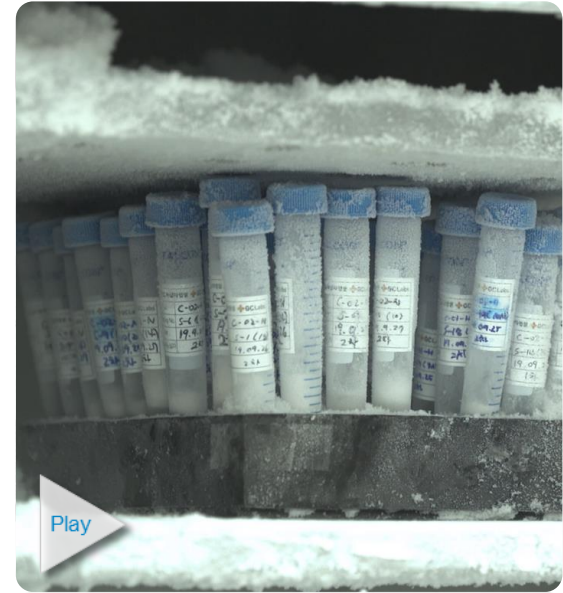
# Clinical Test

Approved by IRB\*

## Melatonin level measured under LM302N NITE

- Subjects: 30 people aged from 20s to 50s
- Test Period: April 2019 – February 2020
- Conditions: 3 days and 2 nights under each lighting\*  
Nighttime (2200K, 190 lux)

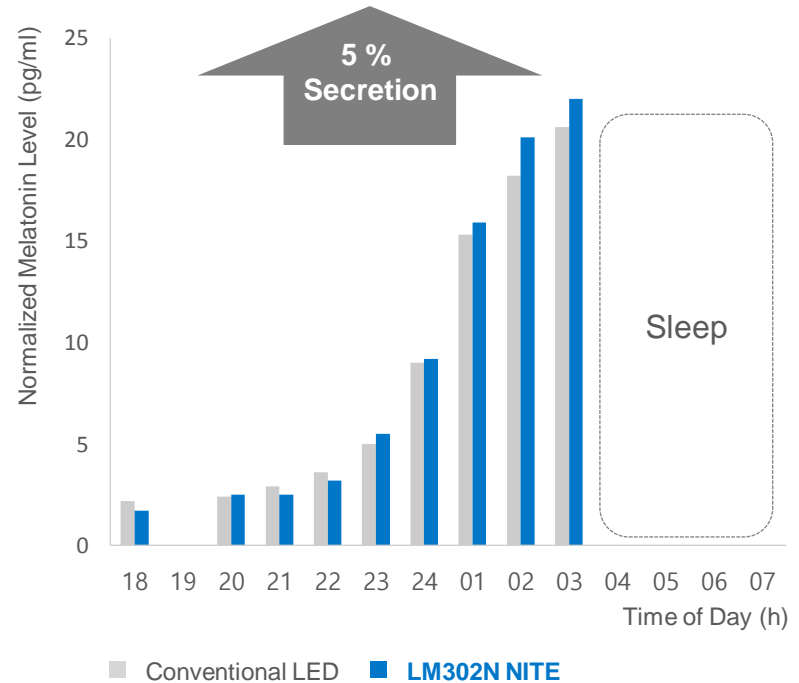
※ Performed under human-centric lighting and conventional lighting in random order



\* IRB: Institutional Review Board

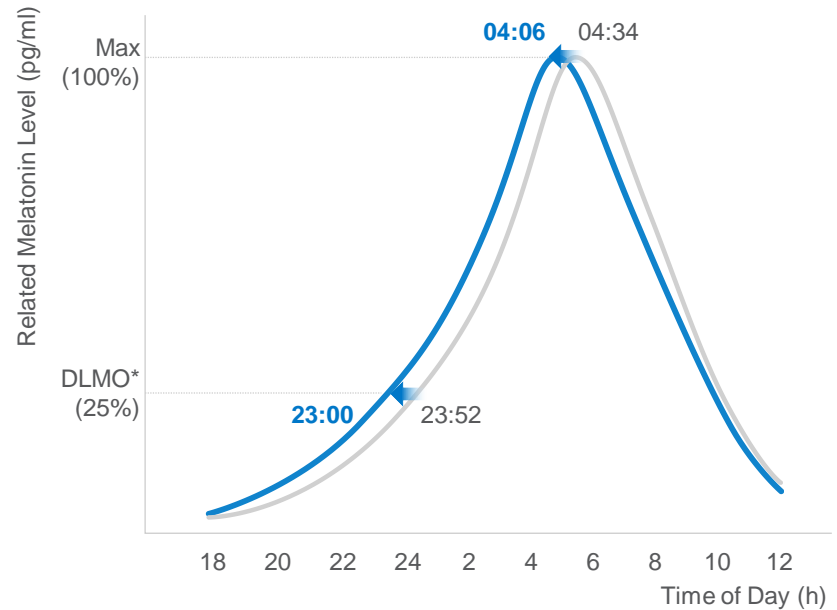
# Clinical Test: Melatonin Level

By lowering intensity of 480nm wavelength, LM302N NITE brings **5% higher melatonin secretion** compared to conventional LED lighting



# Clinical Test: Sleep Level

Higher melatonin secretion leads to 52-min faster time to deep sleep



■ Conventional LED ■ LM302N NITE

\* DLMO: Dim Light Melatonin Onset (25% of melatonin max)

※ Melatonin Real Data Fitting

# The Right Light for the Relaxing Moments

## LM302N NITE

CCT (K)	Flux Bin	Flux Range (lm)	M/P Ratio
1800	S0	80 – 95	0.20
2200	S0	90 – 105	0.28
2700	S0	95 – 110	0.37
3000	S0	105 – 120	0.48
3500	S0	110 – 125	0.56
4000	S0	110 - 125	0.64



**Thank you**