



BRIGHTTEK
BRIGHTTEK (EUROPE) LIMITED

Brighten up The World With LED!



ISO/TS 16949:2009

BSI EM ISO 14001:2004

QC 90000 IECQ HSP98

PRODUCT DATASHEET



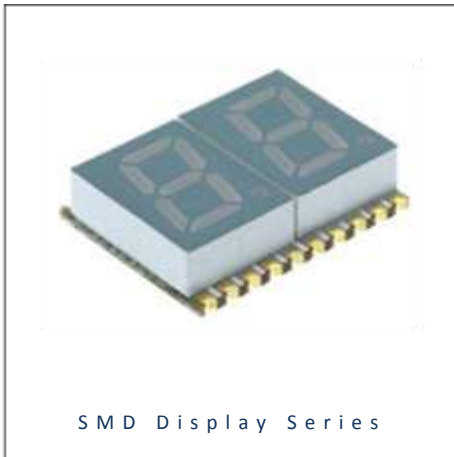
- ▶ SMD Display
- ▶ 0.2" (5mm) 8.8.
- ▶ Red 625nm

NOR16D60GS

NOR16D61GS



Release Date: 10 February 2015 Version: A1.0



APPLICATIONS:

- 7-Segment Display
- Signal Display
- Information Board
- Counter

SMD Display Series

RoHS Compliant



FEATURES:

- **Package:** SMD Numeral Double Digit Display
- **Forward Current:** 20mA per diode
- **Pulse Current:** 90mA per diode
- **Forward Voltage (typ.):** 2.0V per diode
- **Luminous Intensity (typ.):** 23mcd @20mA per diode
- **Colour:** Red
- **Wavelength:** 625nm
- **Materials:**
 - Die: GaAlAs
 - Resin: Epoxy (White Diffused)
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **Grouping parameters:**
 - Forward voltage
 - Luminous intensity
 - Dominant wavelength
- **Soldering methods:** Reflow
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 1000pcs/reel

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current *	I_F	25	mA
Peak Forward Current Duty 1/10 @1KHz	I_{FP}	90	mA
Reverse Current @5V	I_R	10	μ A
Power Dissipation	P_D	70	mW
Debating Liner per Segment (from 25°C)	---	0.28	mA/°C
Operating Temperature	T_{OPR}	-40~+105	°C
Storage Temperature	T_{STG}	-40~+105	°C

1. All parameters are per diode.

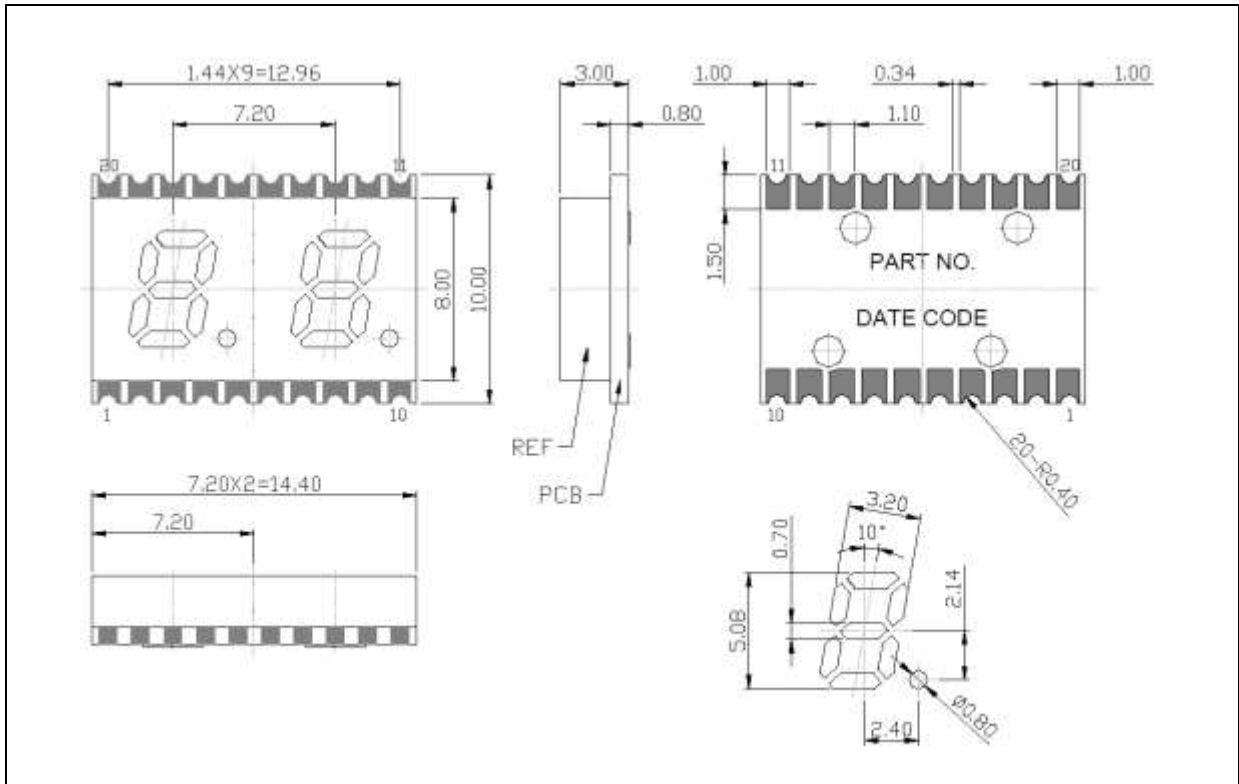
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.6	2.0	2.6	V	$I_F=20$ mA
Luminous Intensity	I_V	6	23	40	mcd	$I_F=20$ mA
Dominant Wavelength	λ_D	619	625	629	nm	$I_F=20$ mA
Spectral Line Half Bandwidth	$\Delta \lambda$	---	20	---	nm	$I_F=20$ mA

1. Luminous intensity (I_V) \pm 15%, Forward Voltage (V_F) \pm 0.1V, Viewing angle($2\theta_{1/2}$) \pm 5%
2. IS standard testing

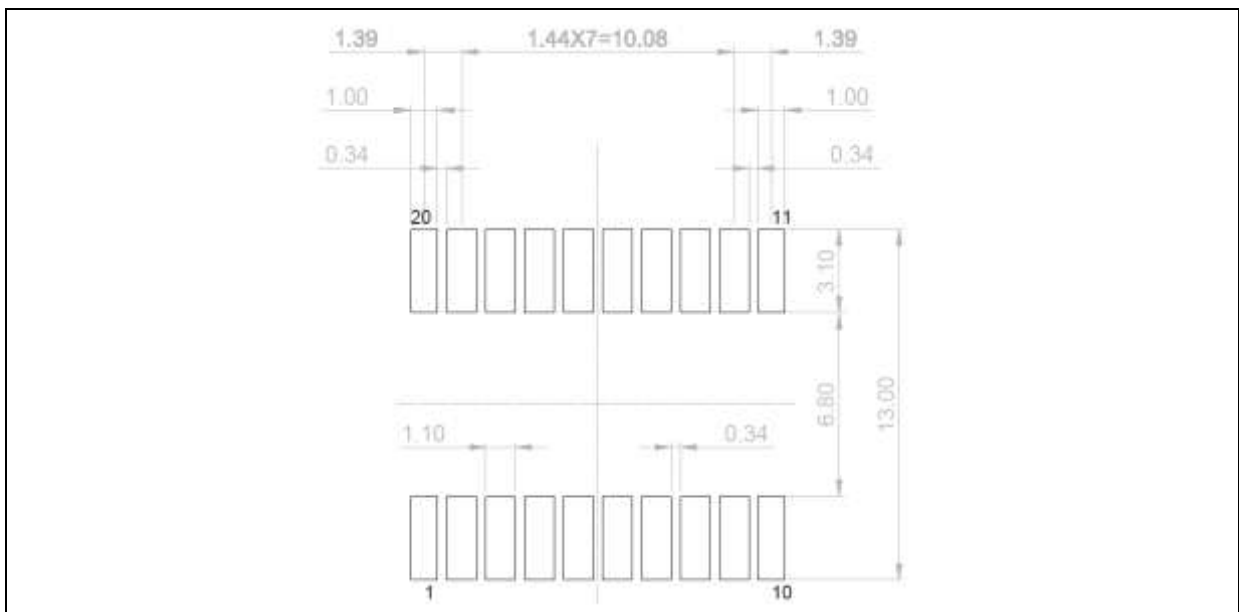
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ± 0.2 mm, unless otherwise noted.

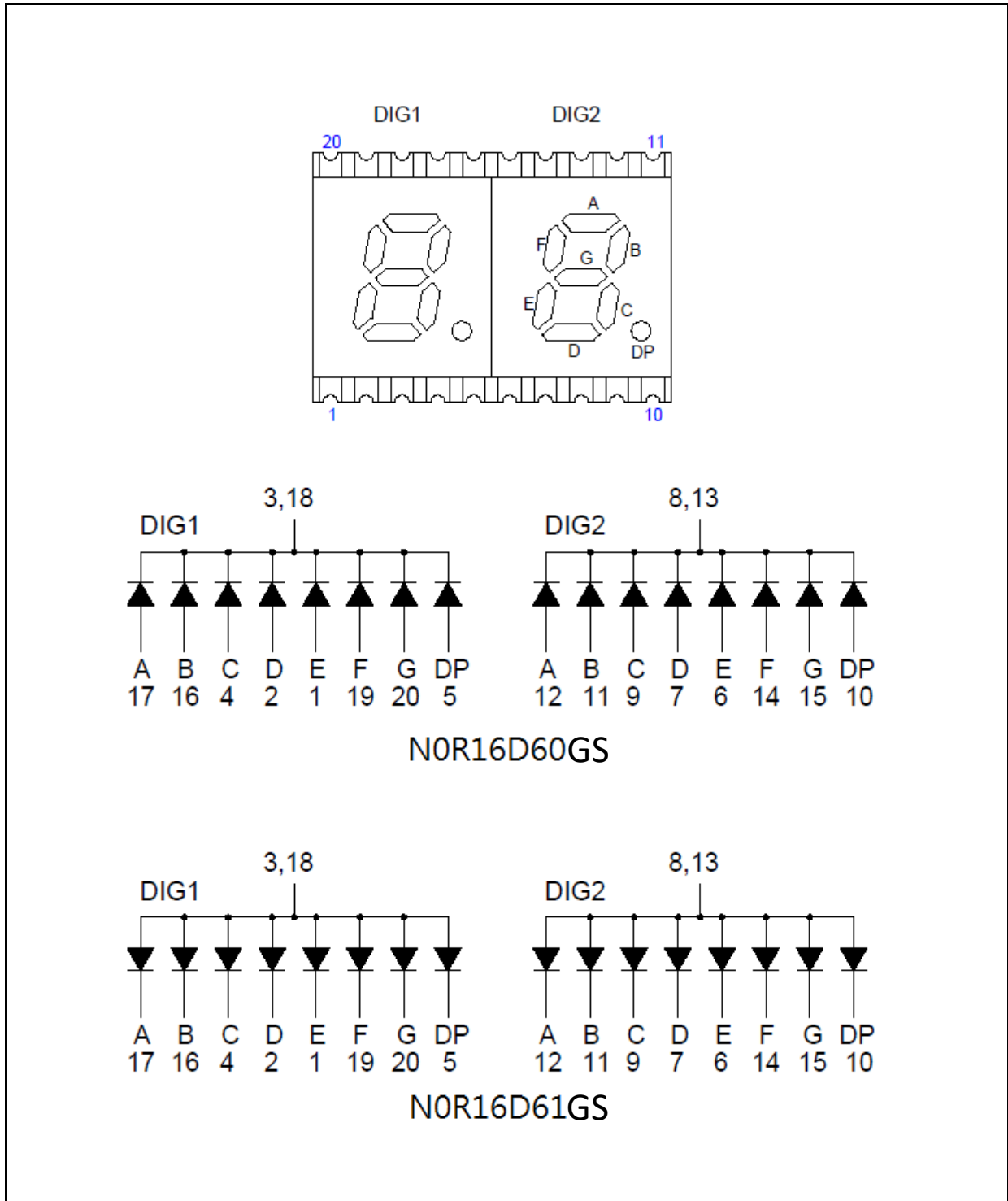
Recommended Solder Pad Design:



1. All dimensions are in millimetre (mm).
2. Tolerance ± 0.2 mm, unless otherwise noted.

Circuit Diagram:

Internal Circuit:



Electrical Connection:

NOR16D60GS:

Pin no.	Function	Pin no.	Function
1	Anode DIG 1 E	11	Anode DIG 1 B
2	Anode DIG 1 D	12	Anode DIG 2 A
3	Common Cathode DIG 1	13	Common Cathode DIG 2
4	Anode DIG 1 C	14	Anode DIG 2 F
5	Anode DIG 1 DP	15	Anode Dig 2 G
6	Anode DIG 2 E	16	Anode DIG 1 B
7	Anode DIG 2 D	17	Anode DIG 1 A
8	Common Cathode DIG 2	18	Common Cathode DIG 1
9	Anode DIG 2 C	19	Anode DIG 1 F
10	Anode DIG 2 DP	20	Anode DIG 1 G

NOR16D61GS:

Pin no.	Function	Pin no.	Function
1	Cathode DIG 1 E	11	Cathode DIG 1 B
2	Cathode DIG 1 D	12	Cathode DIG 2 A
3	Common Anode DIG 1	13	Common Anode DIG 2
4	Cathode DIG 1 C	14	Cathode DIG 2 F
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9	Cathode DIG 2 C	19	Cathode DIG 1 F
10	Cathode DIG 2 DP	20	Cathode DIG 1 G

BINNING GROUPS:

 Forward Voltage Classifications ($I_F = 20\text{mA}$):

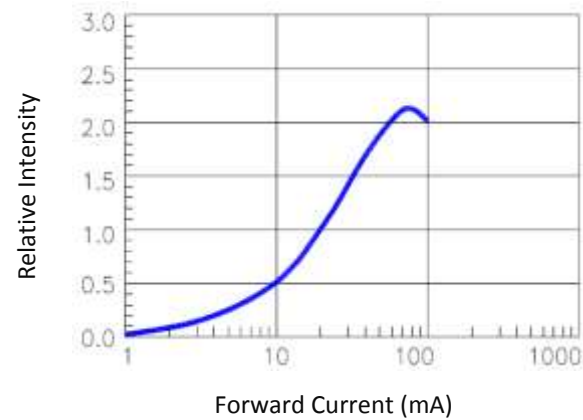
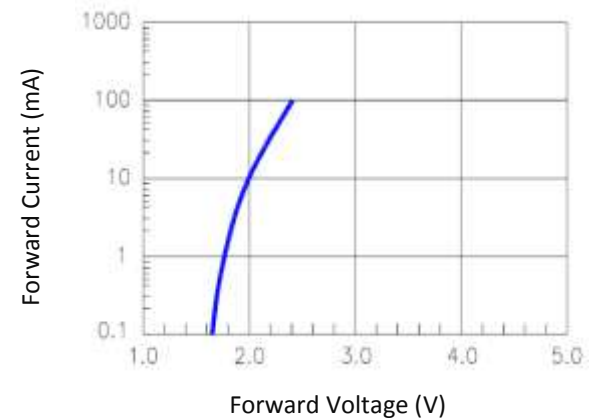
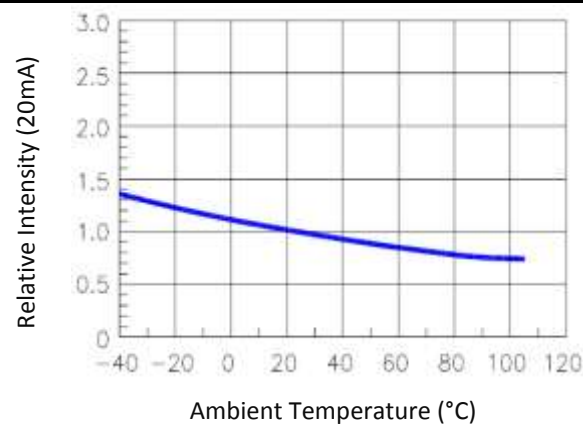
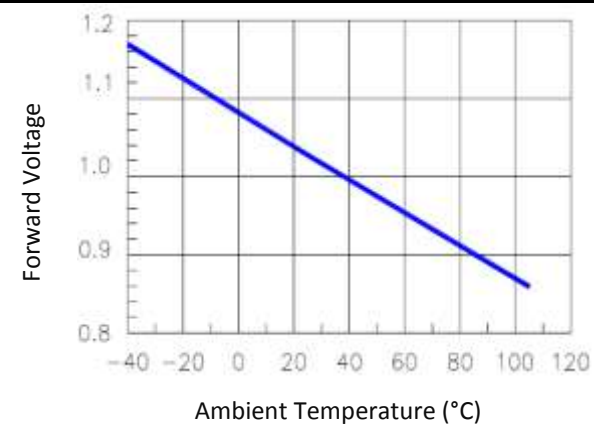
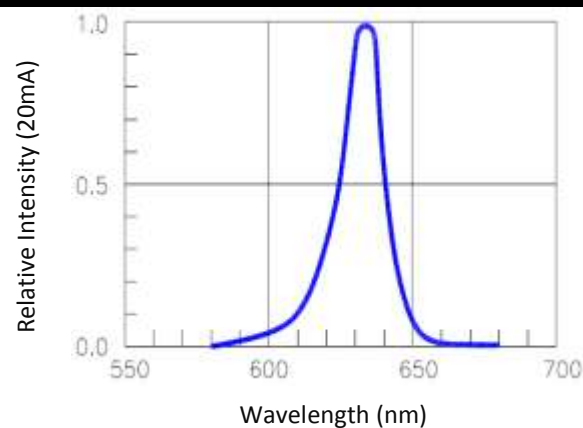
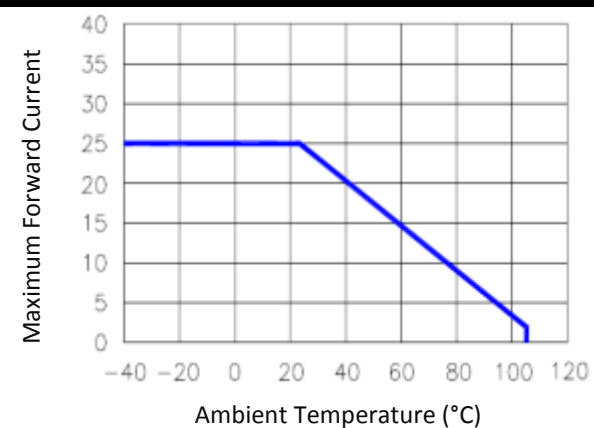
Code	Min.	Max.	Unit
D	1.6	2.6	V

 Luminous Intensity Classifications ($I_F = 20\text{mA}$):

Code	Min.	Max.	Unit
L	6	20	mcd
M	20	30	
N	30	40	

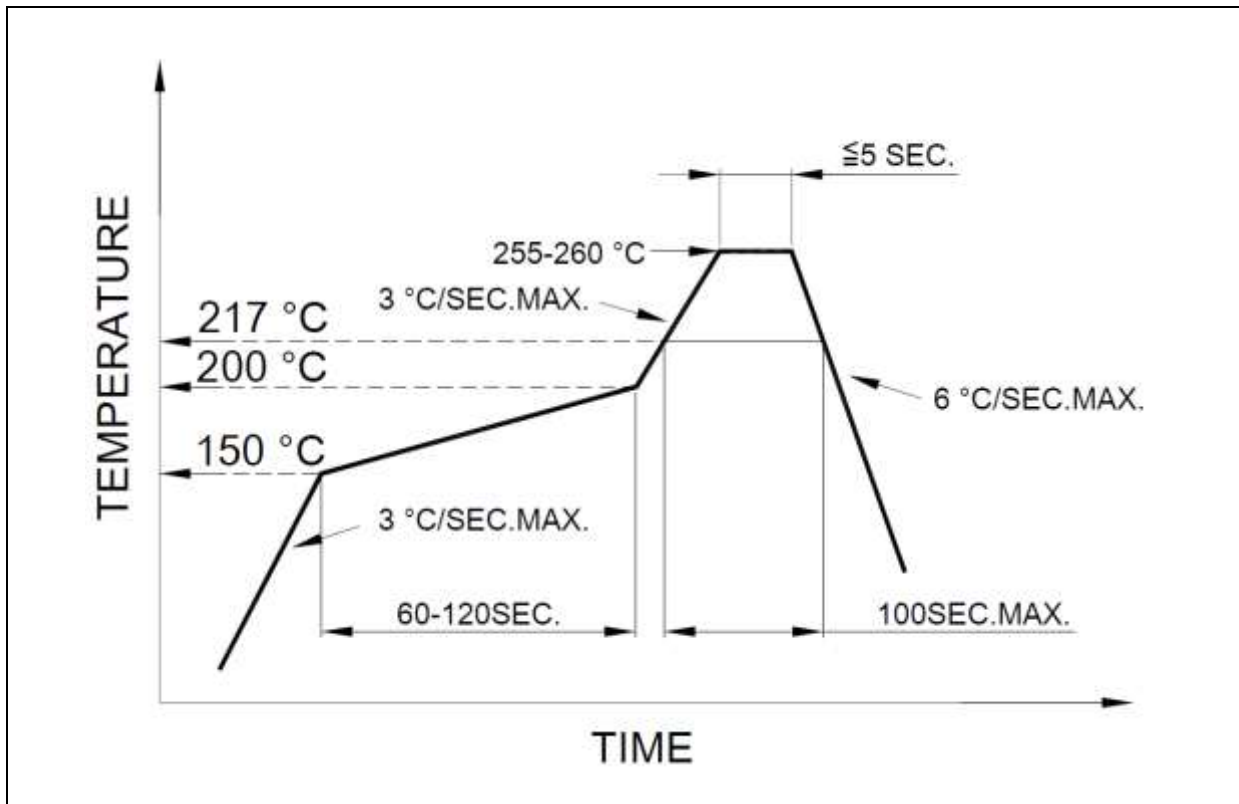
 Dominant Wavelength Classifications ($I_F = 20\text{mA}$):

Code	Min.	Max.	Unit
1	619	622	nm
2	622	626	
3	626	629	

ELECTRO-OPTICAL CHARACTERISTICS:
Relative Intensity v.s. Forward Current

Forward Current v.s. Forward Voltage

Relative Intensity v.s. Temperature

Forward Voltage v.s. Temperature

Relative Spectral Distribution

Max. Forward Current v.s. Temperature


RECOMMENDED SOLDERING PROFILE:

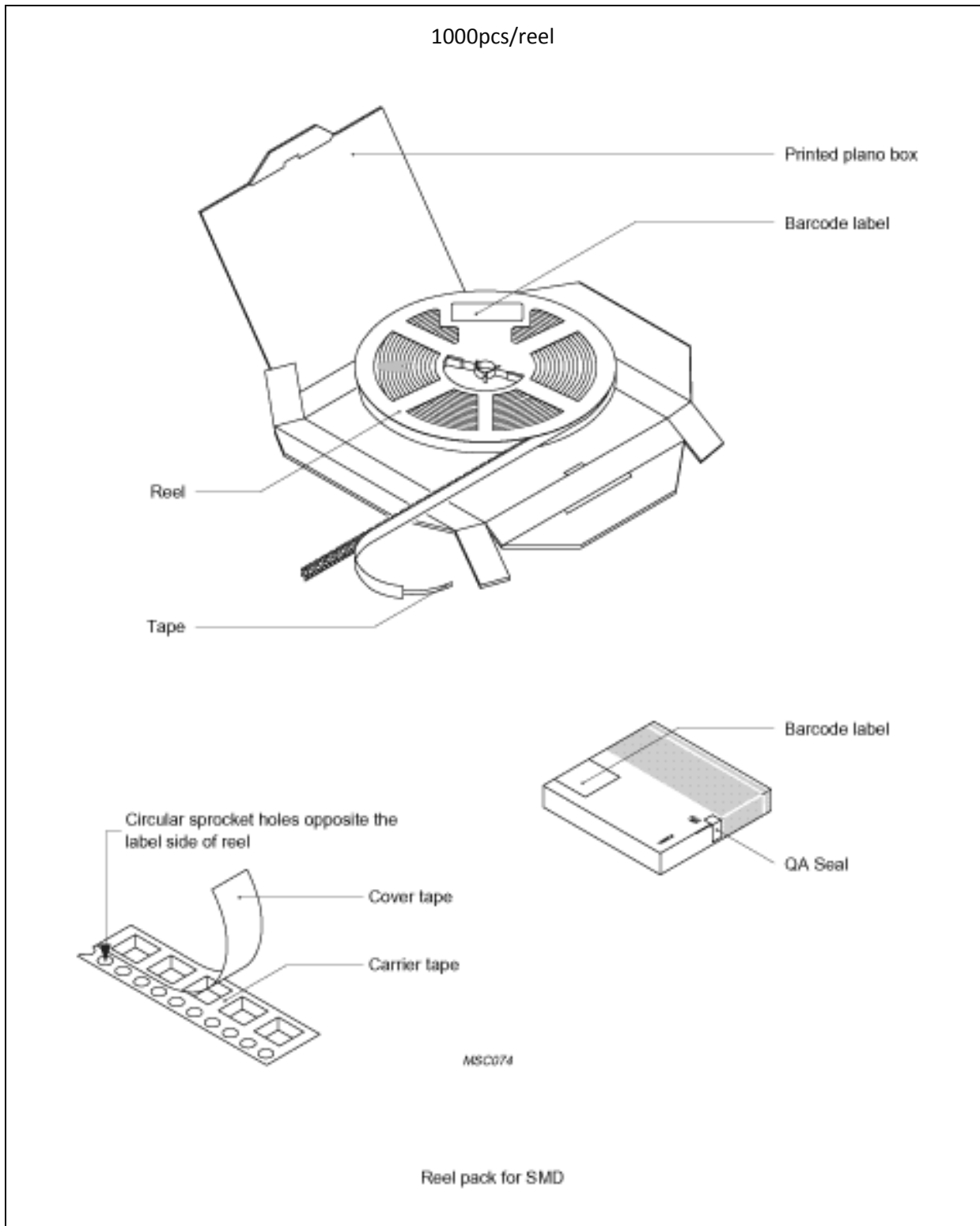
Reflow Solder:



Note:

1. Recommend reflow temperature 245°C.
2. Maximum reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

PACKING SPECIFICATION:



PRECAUTIONS OF USE:

Storage:

It is recommended to store the products in the following conditions:

- Humidity: 60% R.H. Max.
- Temperature: 5°C~30°C (41°F ~86°F).

Shelf life in sealed bag: 12 month at 5°C~30°C and <60% R.H.

Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp-proof box with desiccating agent and apply baking at 60°C±5°C for 15hrs before use.

Baking:

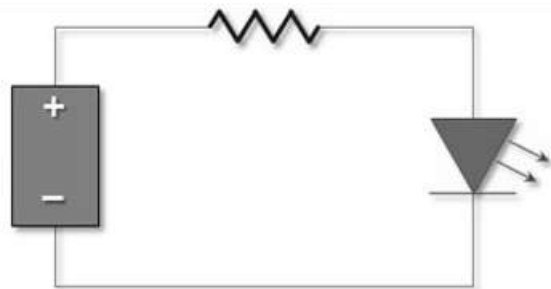
It is recommended to bake the LED before soldering if the pack has been unsealed for longer than 24hrs.

The suggested baking conditions are as followings:

- 70±3°C x 24hrs and <5%RH, taped / reel package.
- 100±3°C x 2hrs, bulk (loose) package.
- 130±3°C x 30min, bulk (loose) package.

It's normal to see slight color fading of carrier (light yellow) after baking in process.

Testing Circuit:



Must apply resistor(s) for protection (over current proof).

Cleaning:

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED carrier / package. Avoid putting any stress force directly on to the LED lens.

ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling the LED all time. All devices, equipment, machinery, work tables, and storage racks must be properly grounded.

In the events of manual working in process, make sure the devices are well protected from ESD at any time.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	10/02/2015	Datasheet set-up.