



2020 Addressable RGB LED SMD LED + IC

MECHANICAL / SPECIFICATIONS

PART NUMBER: 587-1024-147F

DIMENSIONS:

2.0 x 2.0 x 0.9mm

LENS COLOR: Clear

LENS MATERIAL: Epoxy

CONTROL WIRES:

Single Wire

STANDARD PACKAGING:

3000 pcs on 7 inch Reel

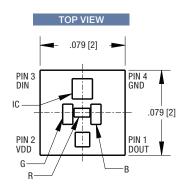
MOISTURE SENSITIVITY LEVEL: 3

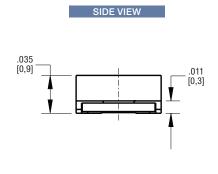
CERTIFICATIONS & RATINGS ROHS Compliant

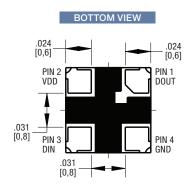
FEATURES & BENEFITS

- Support signal reshaping to pass control waveforms to next adjacent driver
- · Cascading port transmission by a single data line
- Built-in current regulator, three-way drive.
- Optional- Optional maximal drive current: 5mA
- 256-step gray-scale output to allow 16,777,216 color display
- Built-in oscillator 20MHz
- LED driver port maximum withstand Voltage 6.5V
- Built-in power-on-reset (2.6V) (@VDD=5V)
- Operating voltage 3.3~5.5V

DIMENSIONS inches [mm]

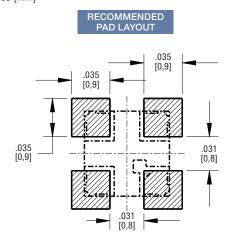


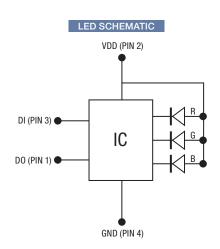






DIMENSIONS inches [mm]





$\label{eq:condition: Condition: Condition: Condition: IC@5V, R/G/B@5mA, Ts=25°C; Tolerance \pm 10\% } \\$

Funithing Color	Motorial	Dominant Wa	velength (nm)	Lumi	Viewing			
Emitting Color	Material	Min.	Max.	Min.	Тур.	Max.	Angle	
R	AllnGaP	618	625	40	65	120	120	
G	InGaN	518	535	60	85	180	120	
В	InGaN	460	474	15	20	60	120	

ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Symbol	Parameter	Rating	Units
V _{DD}	Supply Voltage	6.5	V
IF	Total DC Current	16.75	mA
T _{OPR}	Operating Temperature Range	-40~85	°C
T _{STO}	Storage Temperature Range	-65~120	°C
$V_{\scriptscriptstyle ESD}$	ESD Voltage	4	kV



ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Min.	Тур.	Max.	Units	Note
VDD	Supply Voltage	3.3	5	5.5	V	
l _{DD}	Operation Current		8.0	1	mA	R,G,B no load
V _{IH}	Input High "H" of DI	V _{DD} *0.45+0.5		VDD	V	
$V_{_{\rm IL}}$	Input Low "L" of DI	0		1.0	V	
$R_{_{PD}}$	Pull Down Resistance		500K		Ω	DI, DO
$V_{_{\mathrm{OH}}}$	Output High "H" of DO	VDD -0.5			V	I _{OH} =4mA
$V_{_{\mathrm{OL}}}$	Output Low "L" of DO			0.4	V	I _{oL} =4mA
l _{sink}	R, G, B Sink Current	4.75	5	5.25	mA	Vo=VDD-3.0V @VDD=5V
l _{leak}	Input leakage			1	uA	DI=VDD
l _{off}	R , G , B off leakage current			1	uA	PWM=0(off), @R, G, B =5V
tPLZ	Propagation			80	ns	
tPZL	delay time			80	ns	DI
tTHL	Rising time		15		ns	$DI \rightarrow D0$, $CL=30pF$
tTLH	Falling time		15		ns	
tR	Rising time		50		ns	R, G, B=mA, CL=30pF
tF	Falling time		50		ns	n, d, d=IIIA, GL=3UPF
F _{data}	Data rate		800		Khz	



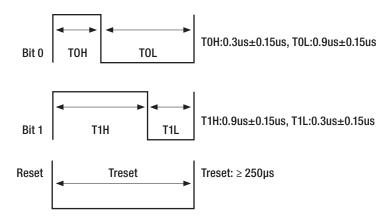
DATA TRANSFER PROTOCOL

	 	Data C	Sycle 1	Reset time (>250us)	 	Data (Sycle 2	
LED1	1st 24-bit data	2nd 24-bit data	3rd 24-bit data		1st 24-bit data	2nd 24-bit data	3rd 24-bit data	
LED2		2nd 24-bit data	3rd 24-bit data			2nd 24-bit data	3rd 24-bit data	
LED3			3rd 24-bit data				3rd 24-bit data	

The single wire data transfer protocol supports 24-bit data for each LED RGB display data refresh. The IC receives 24-bit data and passes the remaining data to next LED. The 24-bit data consist of green, red and blue data, each with 8-bit width, and are transferred with MSB first.

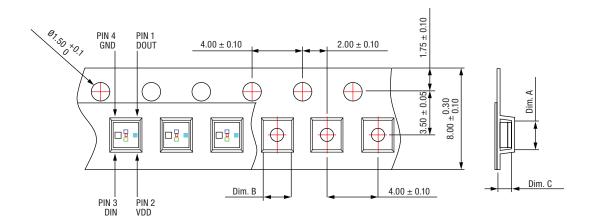
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- 1	67	66	CE.	64	L C 2	L C2	L C1	GO	R7	R6	R5	R4	R3	เกา	D1	DO	D7	B6	B5	B4	D2	B2	D1	B0
- 1	u/	են	G5	G4	სპ	l GZ	ն:	uu	n/	no	เกง	n 4	l us	KZ	l ni	KU	D/	50	DJ DJ	D4	D3	D2	וטן	ן טט
- 1					l	l .	l						l			l .		l						1 /

The transferred data are recognized based on the pulse widths received by the IC. A low bit 0 is represented by a 0.3us high pulse followed by a 0.9us low pulse. A high bit 1 is represented by a 0.9us high pulse followed by a 0.3us low pulse. A low pulse \geq 250us is used to issue a reset command to the IC to start a new cycle of serial commands.



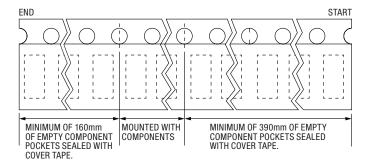


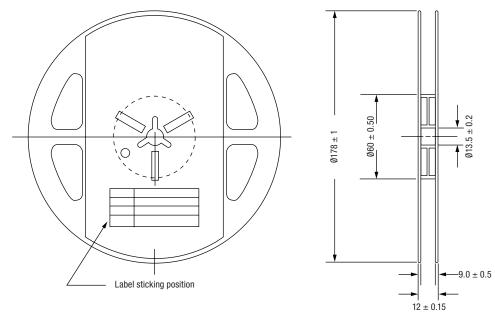
TAPE AND REEL SPECIFICATION



Dim A	Dim B	Dim C	Quantity/Reel
2.15±0.10	2.15±0.10	1.05±0.10	3K

Unit: mm





Unit: mm

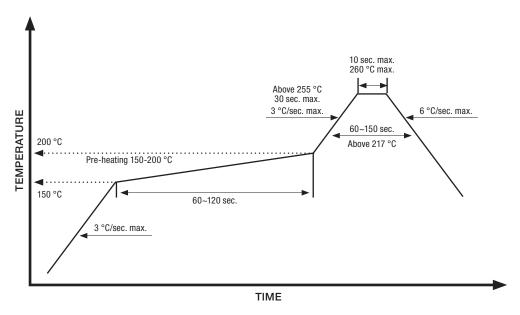


REFLOW SOLDERING

Recommended soldering paste specifications:

- 1. Operating temp.: Above 217 °C, 60~150 sec.
- 2. Peak temp.: 260 °C max, 10 sec 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





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