AVAGO TECHNOLOGIES

Solid State Lighting

Mid- and High-Power LEDs, LED-Modules and Color Management



Your Imagination, Our Innovation

Sense • Illuminate • Connect

Solid-State Lighting

Mid- and High-Power LEDs

0.5 Watt Mid-Power PLCC-4 Surface Mount LEDs

Description

The superior design allows this high-reliability LED package to be driven at high currents. The module dissipates heat very efficiently and produces high light output with better flux performance and a longer life time with minimum degradation thanks to enhanced silicone resin material.



0.5 Watt PLCC-4

Typical Applications

- Backlighting
- Dome/map lighting
- Puddle lamp/glove compartment illumination
- Decorative lighting
- Signage

Features

- 0.5 Watt mid-power enhanced PLCC-4 package
- Thermal Resistance: 60 K/W
- High junction temperature: 125 °C
- Robust operating temperature: -40 to +110 °C
- Compatible with IR and TTW soldering processes
- Super wide viewing angle: 120°
- JEDEC moisture sensitivity level (MSL) 2a
- Available Colors:
  cool white, warm white, blue, green, amber, red-orange, red



0.5 Watt Cool White PLCC-4



0.5 Watt Warm White PLCC-4

Color	Color Temperature	Part Number	Min. Flux (lm)	Typ. Flux (lm)	Max. Flux (lm)	Test Current (mA)	Dice Technology
Cool White	starts at 4500K	ASMT-QWBE-NFH0E	15.0	19.5	33.0	150	InGaN
Warm White	starts at 2500K	ASMT-QYBE-NEG0E	11.5	18.0	25.5	150	InGaN

Color	Part Number	Min. Flux (lm)	Typ. Flux (lm)	Max. Flux (lm)	Test Current (mA)	Dice Technology
Amber	ASMT-QAB2-FDE0E	9.0	11.4	15.0	150	AlInGaP
Red Orange	ASMT-QHB2-FEF0E	11.5	14.0	19.5	150	AlInGaP
Red	ASMT-QRB2-FCD0E	7.0	9.8	11.5	150	AlInGaP
Blue	ASMT-QBBE-N0B0E	3.4	4.8	7.0	150	InGaN
Green	ASMT-QGBE-NEG0E	11.5	17.0	25.5	150	InGaN

Notes: 1. ΦV is the total luminous flux output as measured with an integrating shere at mono pulse conditions.
2. Tolerance = ± 12 %

Tri-Color 0.5 Watt Mid-Power PLCC-4 Surface Mount LEDs



ASMT-QTB0:
Tri-Color 0.5 Watt Black-Surface PLCC-4



ASMT-QTC0:
Tri-Color 0.5 Watt Black-Body PLCC-4

Typical Applications

- Electronic signs and signals
- Interior and exterior full-color signs
- Interior automotive and backlighting
- Office automation, home appliances, industrial equipment
- Color-changing mood-lighting applications

Features

- Extra high-brightness AlInGaP and InGaN dice technologies
- Black surface/full black LED body for increased contrast ratio
- Thermal resistance: red 95 K/W, green 70 K/W, blue 60 K/W
- High junction temperature: 125°C
- Robust operating temperature: -40 to +110 °C
- Wide viewing angle at 120°/115°
- High-reliability package: JEDEC MSL Level 2a
- Long-life performance: ~ 50 kh with silicon material

Part Number	AlInGaP Red			InGaN Green			InGaN Blue		
	Min. IV @ 20 mA		Typ. IV @ 20 mA	Min. IV @ 20 mA		Typ. IV @ 20 mA	Min. IV @ 20 mA		Typ. IV @ 20 mA
	Bin ID	(mcd)	(mcd)	Bin ID	(mcd)	(mcd)	Bin ID	(mcd)	(mcd)
ASMT-QTB0-0AA02	U1	450	620	V2	900	1200	S2	224	280
ASMT-QTC0-0AA02	S1	180	315	T1	285	470	R1	112.5	140

Extra Bright Tri-Color PLCC-6 Surface Mount LED



ASMT-YTB0:
Tri-Color Black-Surface PLCC-6

Typical Applications

- Electronic signs and signals
- Interior and exterior full-color signs
- Interior automotive and backlighting
- Office automation, home appliances, industrial equipment
- Color-changing mood-lighting applications

Features

- Industry Standard PLCC-6 package with individual addressable pin-out for higher flexibility of driving configuration
- Extra high-brightness AlInGaP and InGaN dice technologies
- Black surface for increased contrast ratio
- High-reliability package: JEDEC MSL Level 2a
- Long-life performance: ~ 50 kh with silicon material
- High junction temperature: 125 °C
- Robust operating temperature: -40 to +110 °C
- Wide viewing angle at 115°

Part Number	AlInGaP Red			InGaN Green			InGaN Blue		
	Min. IV @ 20 mA		Typ. IV @ 20 mA	Min. IV @ 20 mA		Typ. IV @ 20 mA	Min. IV @ 20 mA		Typ. IV @ 20 mA
	Bin ID	(mcd)	(mcd)	Bin ID	(mcd)	(mcd)	Bin ID	(mcd)	(mcd)
ASMT-YTB0-0AA02	U1	450	648	V2	900	1243	S2	224	238

High-Power Single-Chip Moonstone™ Family



Moonstone™ Clear

Moonstone™ Diffused

Moonstone™ Star 2 Module (MCPCB)

Moonstone™ Star 1 Module (MCPCB)

Typical Applications

- General lighting
- Reading light
- Decorative lighting
- Garden lighting
- Architectural lighting
- Specialty lighting
- Street lights
- Signage

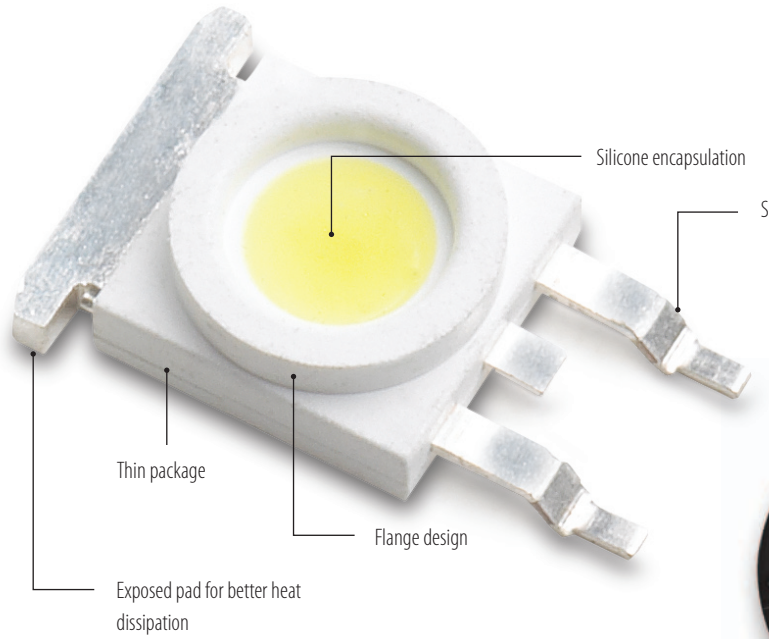
1 Watt White Moonstone™ Surface Mount LEDs

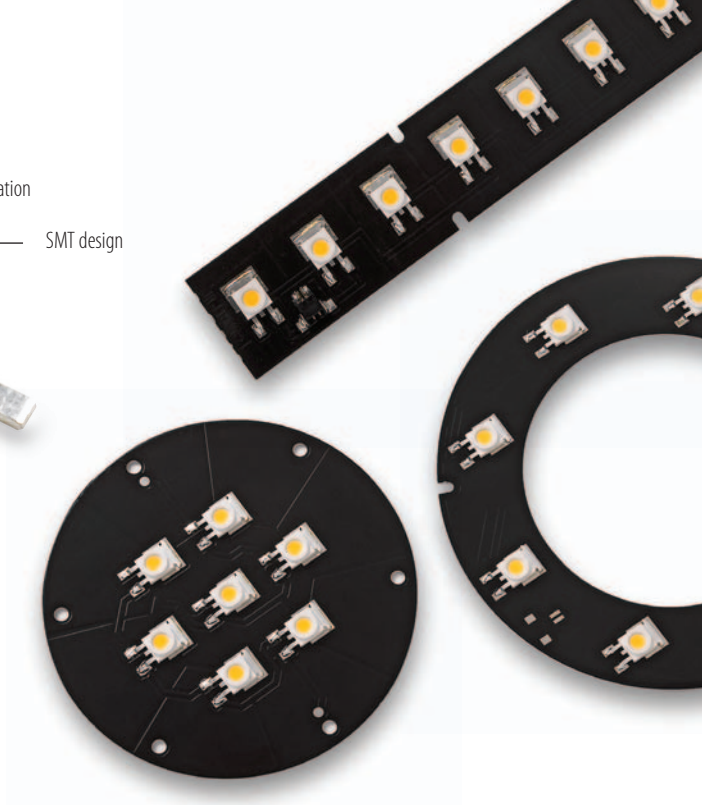
Product Number	Description	Color Temperature	Color Bin	Flux Bin	Luminous Flux (typ.)	Max. Current	Viewing Angle	Clear/ Diffused	Type	Packing
ASMT-MW01-NFH00	1W Cool White / Low-cost	4000–10000K	A,B,C,D,E,F,G,H	F,G,H	35 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MW01-NFH01	1W Cool White / Low-cost	4000–10000K	A,B,C,D,E,F,G,H	F,G,H	35 lm	350 mA	110°	Clear	Emitter	Tape & Reel
ASMT-MW00-NJK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J,K	55 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MW00-NJK01	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J,K	55 lm	350 mA	110°	Clear	Emitter	Tape & Reel
ASMT-MW00-NKK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	K	60 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MW09-NKL00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	K,L	75 lm	350 mA	120°	Clear	Emitter	Tube
ASMT-MW09-NLL00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	L	80 lm	350 mA	120°	Clear	Emitter	Tube
ASMT-MWB1-NJK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J,K	50 lm	350 mA	110°	Diffused	Emitter	Tube
ASMT-MWA0-NJK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J,K	55 lm	350 mA	110°	Clear	Star 1	Tube
ASMT-MWA0-NKK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	K	60 lm	350 mA	110°	Clear	Star 1	Tube
ASMT-MWC1-NJK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J,K	50 lm	350 mA	110°	Diffused	Star 1	Tube
ASMT-MWK0-NKK00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	K	60 lm	350 mA	110°	Clear	Star 2	Tube
ASMT-MWL1-NJJ00	1W Cool White	4000–10000K	A,B,C,D,E,F,G,H	J	46 lm	350 mA	110°	Diffused	Star 2	Tube
ASMT-MY01-NFH00	1W Warm White /Low-cost	2600–4000K	A,B,C,D,E,F	F,G,H	30 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MY00-NHJ00	1W Warm White	2600–4000K	A,B,C,D,E,F	H,J	40 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MY00-NJK00	1W Warm White	2600–4000K	A,B,C,D,E,F	J,K	50 lm	350 mA	110°	Clear	Emitter	Tube
ASMT-MYB1-NJK00	1W Warm White	2600–4000K	A,B,C,D,E,F	J,K	46 lm	350 mA	110°	Diffused	Emitter	Tube
ASMT-MYA0-NJK00	1W Warm White	2600–4000K	A,B,C,D,E,F	J,K	50 lm	350 mA	110°	Clear	Star 1	Tube
ASMT-MYC1-NJK00	1W Warm White	2600–4000K	A,B,C,D,E,F	J,K	46 lm	350 mA	110°	Diffused	Star 1	Tube
ASMT-MYK0-NKK00	1W Warm White	2600–4000K	A,B,C,D,E,F	K	55 lm	350 mA	110°	Clear	Star 2	Tube
ASMT-MYL1-NJJ00	1W Warm White	2600–4000K	A,B,C,D,E,F	J	43 lm	350 mA	110°	Diffused	Star 2	Tube

The above product overview for White Moonstone™ Surface Mount LEDs is a selection of most commonly used options. Diffused Moonstone™ Products have an additional diffusing layer for best-in-class Color-uniformity. This is often preferred in combination with secondary optics (Lenses).

1 Watt Color Moonstone™ Surface Mount LEDs

Product Number	Description	Color	Color Bin	Flux Bin	Luminous Flux (typ.)	Max. Current	Viewing Angle	Clear/ Diffused	Type	Packing
ASMT-MA00-AGH00	1W AlInGaP Amber	582–595nm	A,B,C,D,E	G,H	35 lm	350 mA	120°	Clear	Emitter	Tube
ASMT-MR00-AHJ00	1W AlInGaP Red	620–635nm	-	H,J	40 lm	350 mA	120°	Clear	Emitter	Tube
ASMT-MG00-NGJ00	1W InGaN Green	515–535nm	A,B,C,D	G,H,J	40 lm	350 mA	120°	Clear	Emitter	Tube
ASMT-MB00-NAE00	1W InGaN Blue	460–480nm	A,B,C,D	A,B,C,D,E	10 lm	350 mA	120°	Clear	Emitter	Tube





High-Power Second Level Moonstone™ Modules (MCPCB)

Part Number	Description	No. of LEDs	Module type	Driving Method	On-board Resistor	Color Temperature	Typ. Flux (lm)	Clear/ Diffused	Packing
ADJD-WM00-NKKZ0	Cool White 2nd level	3	Strip	Current	No	4500–5600K	180	Clear	Tray
ADJD-YM00-NJJZ0	Warm White 2nd level	3	Strip	Current	No	2600–3000K	150	Clear	Tray
ADJD-WM01-NKKZ0	Cool White 2nd level	3	Strip	Voltage	Yes	4500–5600K	180	Clear	Tray
ADJD-YM01-NJJZ0	Warm White 2nd level	3	Strip	Voltage	Yes	2600–3000K	150	Clear	Tray
ADJD-WM10-NKKZ0	Cool White 2nd level	4	Strip	Current	No	4500–5600K	240	Clear	Tray
ADJD-YM10-NJJZ0	Warm White 2nd level	4	Strip	Current	No	2600–3000K	200	Clear	Tray
ADJD-WM21-NKKZ0	Cool White 2nd level	6	Strip	Voltage	Yes	4500–5600K	360	Clear	Tray
ADJD-YM21-NJJZ0	Warm White 2nd level	6	Strip	Voltage	Yes	2600–3000K	300	Clear	Tray
ADJD-WM30-NKKZ0	Cool White 2nd level	9	Strip	Current	No	4500–5600K	540	Clear	Tray
ADJD-YM30-NJJZ0	Warm White 2nd level	9	Strip	Current	No	2600–3000K	450	Clear	Tray
ADJD-WM40-NKKZ0	Cool White 2nd level	12	Strip	Current	No	4500–5600K	720	Clear	Tray
ADJD-YM40-NJJZ0	Warm White 2nd level	12	Strip	Current	No	2600–3000K	600	Clear	Tray
ADJD-WMR0-NKKZ0	Cool White 2nd level	7	Round	Current	No	4500–5600K	420	Clear	Tray
ADJD-YMR0-NJJZ0	Warm White 2nd level	7	Round	Current	No	2600–3000K	350	Clear	Tray
ADJD-WMR3-NKKZ0	Cool White 2nd level	8	Ring	Current	No	4500–5600K	480	Clear	Tray
ADJD-YMR3-NJJZ0	Warm White 2nd level	8	Ring	Current	No	2600–3000K	400	Clear	Tray

Remarks: 1. ADJD-xM01 and ADJD-xM21 are voltage driven. On board resistor is included in each strip.
2. The total typical flux for each level 2 strip is derived by multiplying the typical flux for each high power LEDs with the number of LEDs that mounted on the metal core PCB. The typical luminous flux for 1W Moonstone cool white and warm white is 60lm and 50lm respectively.

Collimator Lenses for Moonstone™ – LED Family with Snap-on Functionality

Product Number	Viewing Angle	Diameter	Height
ASMT-M006	6°	29 mm	14.4 mm
ASMT-M015	15°	20 mm	7.8 mm
ASMT-M030	30°	20 mm	10.8 mm



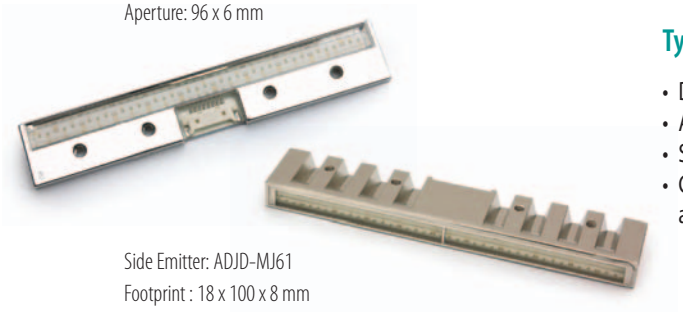
LED Modules and Color Sensors

24 Watt High Power RGB Multi-Chip Light-Source Modules

Description

LED chips in the high-power light source modules are attached directly to a metal core PCB/heat sink. Any heat generated by the LEDs can be dispatched efficiently to an external heat sink. The thermal resistance is approx. 2 K/W. Good thermal management allows low junction temperature operation to maximize the efficiency.

Top Emitter: ADJD-MJ51
Footprint: 18 x 100 x 3.6 mm
Aperture: 96 x 6 mm



Side Emitter: ADJD-MJ61
Footprint : 18 x 100 x 8 mm
Aperture : 96 x 4.6 mm

Typical Applications

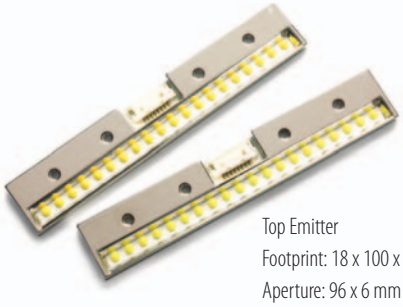
- Decorative lighting
- Architectural lighting
- Specialty lighting
- Color-changing mood-lighting applications

Features

- Plug-and-play
- Large choice of colors
- Low thermal resistance: 2 K/W
- Thin package profile
- Top and side firing
- High flux output: 480 lm (RGB) @ 24 Watt
- Long life (silicone encapsulation)
- High chip-packaging density
- No soldering needed

Product Number	Power	Color	Chip Technology	Luminous Flux (typ.)	Forward Current
ADJD-MJ51	24 W	RGB	AlInGaP/InGaN	480 lm	750 mA
ADJD-MJ61	24 W	RGB	AlInGaP/InGaN	480 lm	750 mA
The following 4 LED-strings are included in both modules:					
String 1 (10 LED-Chips)		Green	InGaN	125 lm	150 mA
String 2 (20 LED-Chips)		Red	AlInGaP	200 lm	300 mA
String 3 (10 LED-Chips)		Blue	InGaN	30 lm	150 mA
String 4 (10 LED-Chips)		Green	InGaN	125 lm	150 mA

Both modules are supplied with a cable and connector for ease of use.



Top Emitter
Footprint: 18 x 100 x 3.6 mm
Aperture: 96 x 6 mm

3.5 Watt and 10.5 Watt High Power White Multi-Chip Light-Source Modules

Typical Applications

- Solid-State lighting
- Decorative lighting
- Architectural lighting
- Specialty lighting

Product Number	Power	Color	Color Temperature (typ.)	Luminous Flux (typ.)	Forward Current
ADJD-WD01	3.5 W	Cool White	5600 K	170 lm	50 mA
ADJD-YD01	3.5 W	Warm White	2800 K	150 lm	50 mA
ADJD-WD21	10.5 W	Cool White	5600 K	500 lm	150 mA
ADJD-YD21	10.5 W	Warm White	2800 K	350 lm	150 mA

Both modules are supplied with a cable and connector for ease of use.



Driver Solutions for High-Power Multi-Chip Light-Source Modules

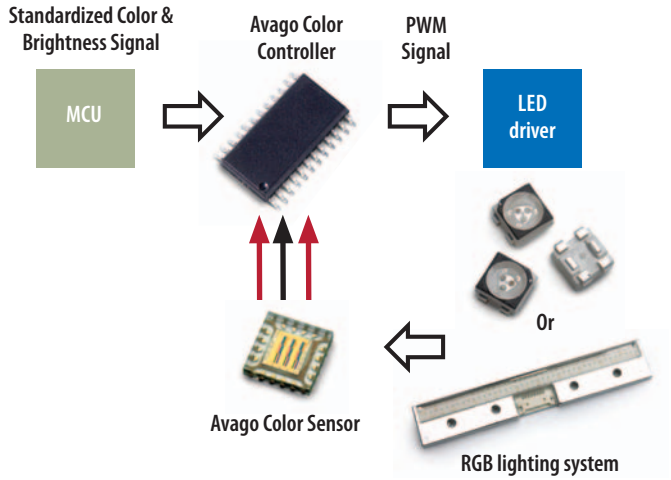
Manufacturer	National Semiconductor	Texas Instruments	ST Microelectronics	Infineon	Zetex Semiconductors
Type	LM3402HV	TPS40200D	L6562A	TLE4242G	ZXLD1362
	LM3431			TLE4241G (3.5W/10.5W)	
	LM3430 + LM3432				

The above mentioned drivers are suitable for all LED modules, unless otherwise stated

Color Sensors and Color Controller for Closed-Loop RGB-Feedback Systems

Product	Product Number	Description	Application
RGB Color Sensor	HDJD-S831-QT333	RGB Color sensor on PCB with connector	Industrial/consumer
	HDJD-S722-QR999	RGB Color sensor (light-to-voltage converter)	Industrial/consumer
	HDJD-S822-QR999	RGB Color sensor (light-to-voltage converter)	Industrial/consumer
	ADJD-S313-QR999	Digital RGB Color sensor (QFN 5x5), digital output via 2-wire serial interface	Consumer
	ADJD-S312-CR999	Digital RGB Color sensor (CSP 3x3), digital output via 2-wire serial interface	Consumer
	ADJD-E622-QR999	RGB Color sensor (light-to-voltage converter)	Automotive
	ADJD-S311-CR999	4-channel (RGB+clear) digital Color sensor	Consumer
	ADJD-S371-QR999	Reflective digital Color sensor module	Consumer
Color Controller	HDJD-J822-SCR00	RGB Color controller	Industrial/consumer
	HDJD-JB01-8831A	Bundle Package: HDJD-S831-QT333 + HDJD-J822-SCR00	Industrial/consumer
	ADJD-J823	RGB Color controller (QFN 5x5) with integrated RGB Color photo sensor	Industrial/consumer

Closed-Loop RGB-Feedback System



HDJD-JD14 Development Kit for Color Controller ADJD-J823

The HDJD-JD14 Kit is a simple development board, which demonstrates the capabilities of the 20-pin ADJD-J823 Color management controller device with integrated RGB photo-sensor as feedback device of an RGB LED-based lighting system. The development kit can be used stand-alone with an auto-load feature enabled, or connected directly to a PC computer (using USB port).

The HDJD-JD14 Development Kit includes:

- HDJD-JD14 Development Board
- HDJD-JD14 FPC Board
- CD-ROM, which contains:
- HDJD-JD14 Development Kit Hardware User Guide
- ICMv2 Operating Software Manual
- Application Notes
- Datasheets

Coming Summer 2008



3 x 1 Watt RGB Moonstone™ Surface Mount LED

Part Number	Color	Luminous Flux, ΦV[1] (lm)			
		Min. Flux (lm)	Typ. Flux (lm)	Test Current (mA)	Dice Technology
ASMT-MT00	Red	20.0	32.0	350	AlInGaP
	Green	31.0	40.0	350	InGaN
	Blue	5.5	9.0	350	InGaN

Notes:
1. ΦV is the total luminous flux output as measured with an integrating sphere at 25ms mono pulse condition.
2. Flux tolerance is X10 %

About Avago Technologies

Avago Technologies is a leading supplier of analog interface components for communications, industrial and consumer applications. By leveraging its core competencies in III-V compound and silicon semiconductor design and processing, the company provides an extensive range of analog, mixed signal and optoelectronics components and subsystems to more than 40,000 customers. Backed by strong customer service support, the company's products serve four diverse end markets: industrial and automotive, wired infrastructure, wireless communications, and computer peripherals. Avago has a global employee presence and heritage of technical innovation dating back 40 years to its Hewlett-Packard roots. Information about Avago is available on the Web at www.avagotech.com

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