FAIRCHILD SEMICONDUCTOR®

December 2005

QTLP651C-R Red
QTLP651C-O Yellow-Orange
QTLP651C-AG Yellow-Green
QTLP651C-IB Blue
QTLP651C-E Orange
QTLP651C-Y Yellow
QTLP651C-IG True Green

Surface Mount LED Lamp Super Bright 1206 (Inner Lens)

Features

- Small footprint – 3.0(L) x 1.5(W) x 1.5(H) mm
- AlInGaP technology for -R, -E, -O, -Y and -AG
- InGaN/SiC technology for -IG and -IB
- Narrow viewing angle of 20°
- Water clear optics
- Moisture-proof packaging
- Available in 0.315" (8mm) width tape on 7" (178mm) diameter reel; 2,000 units per reel

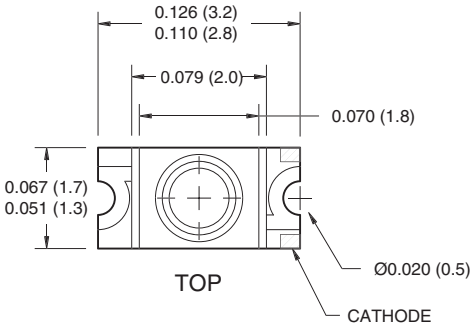
Applications

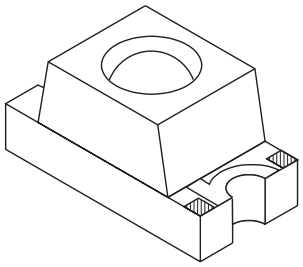
- Keypad backlighting
- Push-button backlighting
- LCD backlighting

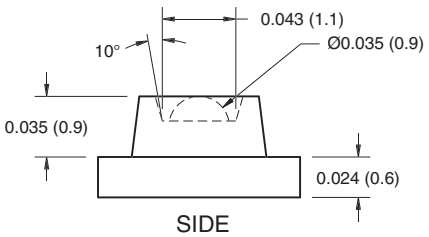
Description

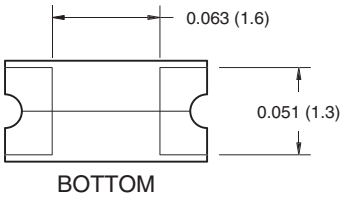
These surface mount chip LEDs are designed to fit industry standard footprint. The package features a recessed, inner lens that focuses the light output, offering greater luminous intensity for direct viewing.

Package Dimensions









POLARITY

NOTE:
Dimensions for all drawings are in inches (mm).
Tolerance is ±0.1mm unless otherwise noted.

Absolute Maximum Ratings (T_A = 25°C Unless otherwise specified)

Parameter	Symbol	QTLP651C					Unit
		-R	-E	-O	-Y	-AG	
Continuous Forward Current	I_F	30	30	30	25	30	mA
Peak Forward Current (f = 1.0 KHz, Duty Factor = 1/10)	I_{FM}	160	160	160	120	160	mA
Reverse Voltage	V_R	5	5	5	5	5	V
Power Dissipation	P_D	72	72	72	60	72	mW
Operating Temperature	T_{OPR}	-40 to +85					°C
Storage Temperature	T_{STG}	-40 to +90					°C
Lead Soldering Time	T_{SOL}	260 for 5 sec					°C

Absolute Maximum Ratings (T_A = 25°C Unless otherwise specified)

Parameter	Symbol	QTLP651C		Unit
		-IB	-IG	
Continuous Forward Current	I_F	30	30	mA
Peak Forward Current (f = 1.0 KHz, Duty Factor = 1/10)	I_{FM}	100	100	mA
Reverse Voltage	V_R	5	5	V
Power Dissipation	P_D	120	120	mW
Operating Temperature	T_{OPR}	-40 to +85		°C
Storage Temperature	T_{STG}	-40 to +90		°C
Lead Soldering Time	T_{SOL}	260 for 5 sec		°C

Electrical / Optical Characteristics (T_A = 25°C)

Part Number	Symbol	QTLP651C					Condition
		-R	-E	-O	-Y	-AG	
Luminous Intensity (mcd)							I_F = 20 mA
Minimum	I_V	25	25	25	25	15	
Typical		70	70	70	70	30	
Forward Voltage (V)							I_F = 20 mA
Maximum	V_F	2.4	2.4	2.4	2.4	2.4	
Typical		2.0	2.0	2.0	2.0	2.0	
Wavelength (nm)							I_F = 20 mA
Peak	λ_P	630	620	610	590	575	
Dominant	λ_D	624	615	605	589	573	
Spectral Line Half Width (nm)	$\Delta\lambda$	20	18	18	15	20	I_F = 20 mA
Viewing Angle (°)	$2\theta^1/2$	20	20	20	20	20	I_F = 20 mA

Electrical / Optical Characteristics (T_A = 25°C)

Part Number	Symbol	QTLP651C		Condition
		-IB	-IG	
Luminous Intensity (mcd)				I_F = 20 mA
Minimum	I_V	35	100	
Typical		45	140	
Forward Voltage (V)				I_F = 20 mA
Maximum	V_F	4.0	4.0	
Typical		3.5	3.5	
Wavelength (nm)				I_F = 20 mA
Peak	λ_P	465	520	
Dominant	λ_D	470	525	
Spectral Line Half Width (nm)	$\Delta\lambda$	25	35	I_F = 20 mA
Viewing Angle (°)	$2\theta^1/2$	20	20	I_F = 20 mA

Typical Performance Curves (QTLP651C-R, -E, -O, -Y and -AG)

Fig. 1 Forward Current vs. Forward Voltage

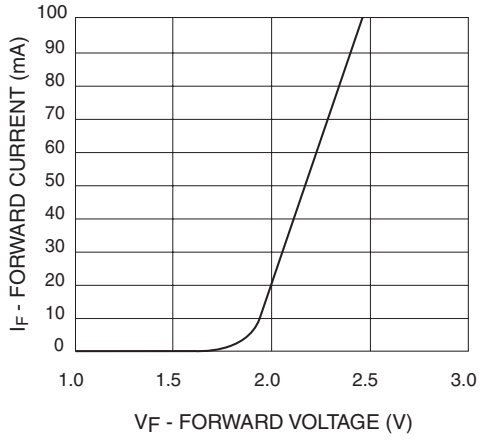


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

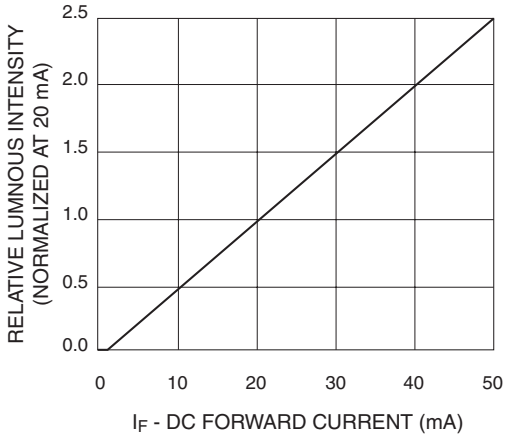


Fig. 3 Relative Intensity vs. Peak Wavelength

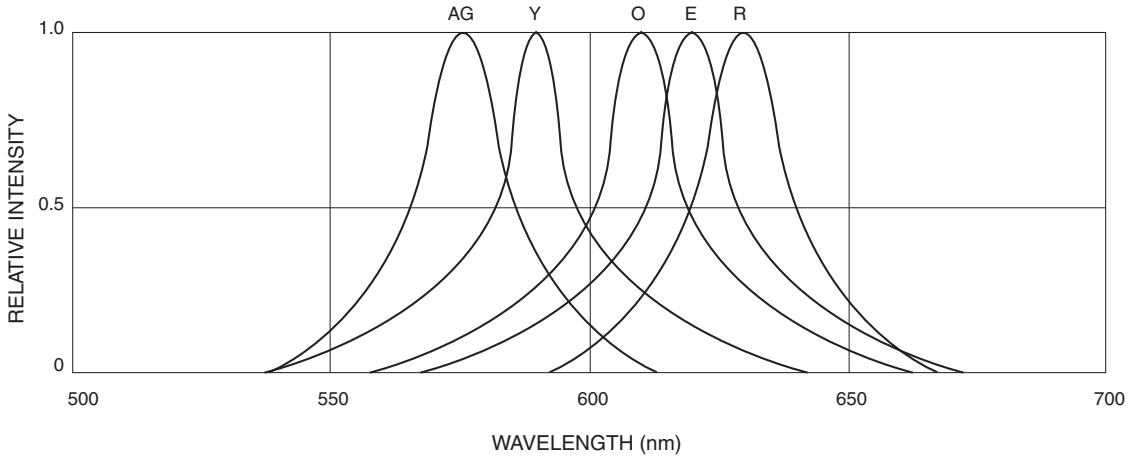


Fig.4 Radiation Diagram

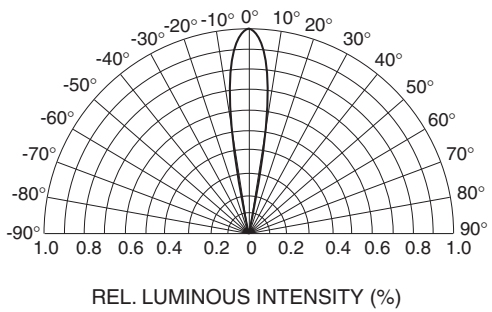
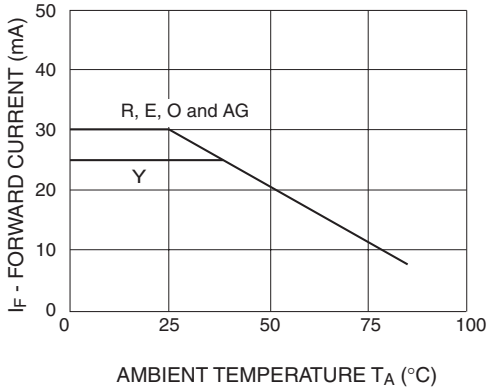


Fig.5 Maximum Forward Current vs. Ambient Temperature



Typical Performance Curves (QTLP651C-IG and -IB)

Fig. 1 Forward Current vs. Forward Voltage

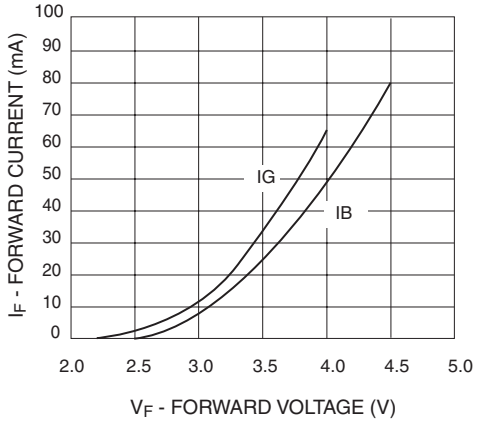


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

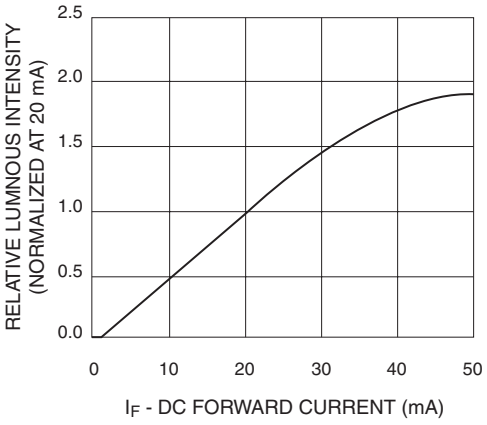


Fig. 3 Relative Intensity vs. Peak Wavelength

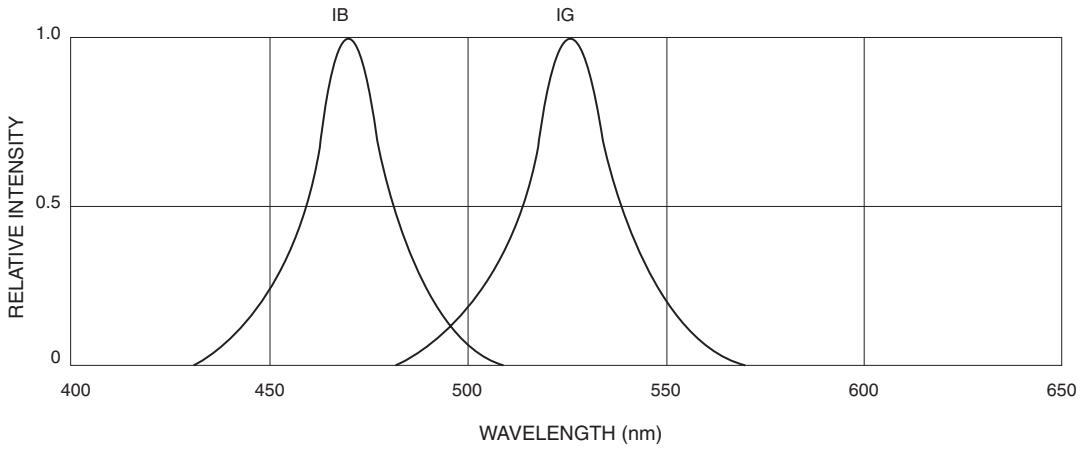


Fig.4 Radiation Diagram

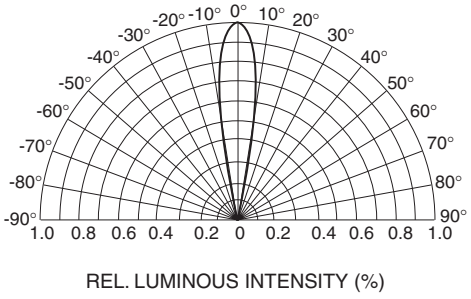
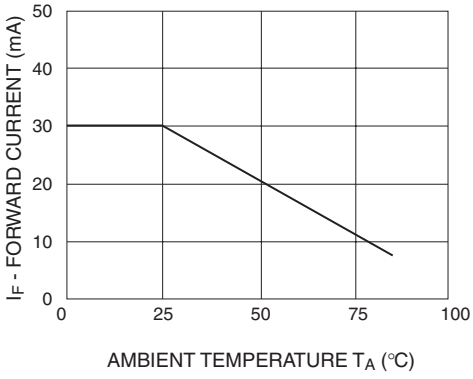
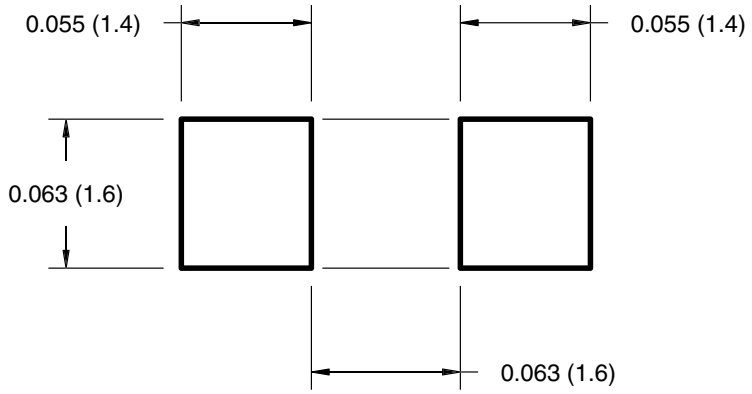


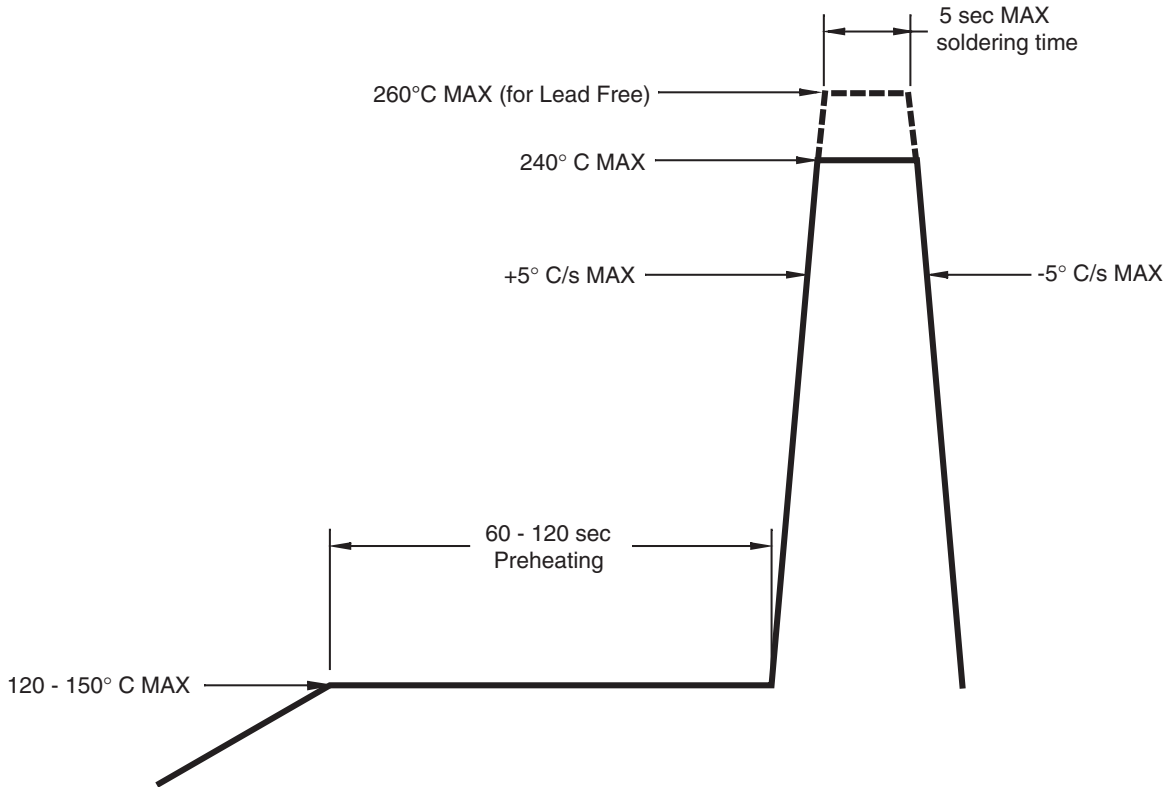
Fig.5 Maximum Forward Current vs. Ambient Temperature



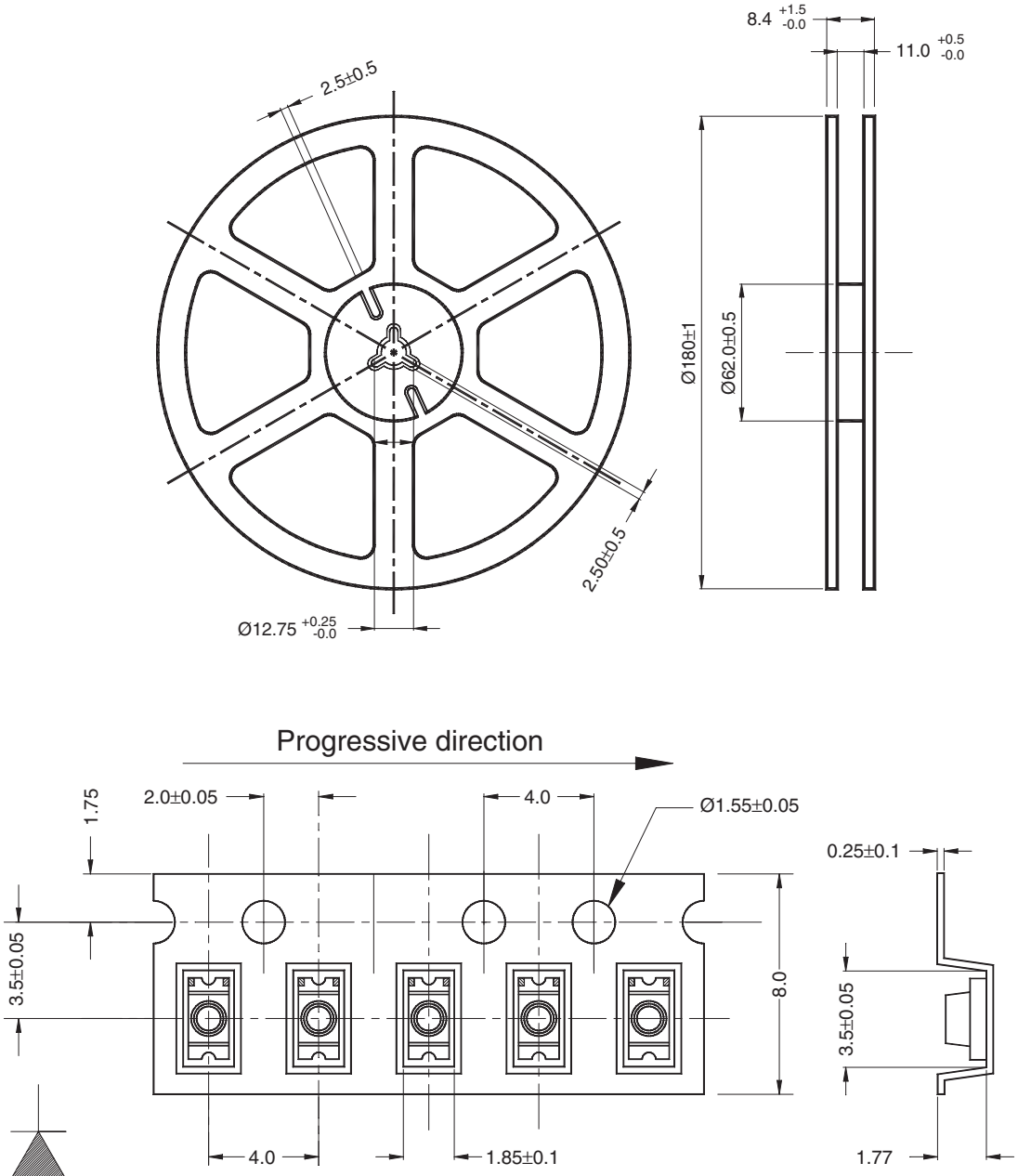
Recommended Printed Circuit Board Pattern



Recommended IR Reflow Soldering Profile



Tape and Reel Dimensions



Dimensional tolerance is ± 0.1mm unless otherwise specified

Angle: ± 0.5

Unit: mm

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx™
ActiveArray™
Bottomless™
Build it Now™
CoolFET™
CROSSVOLT™
DOME™
EcoSPARK™
E^2CMOS™
EnSigna™
FACT™
FACT Quiet Series™
FAST®
FASTr™
FPS™
FRFET™
GlobalOptoisolator™
GTO™
HiSeC™
I^2C™
i-Lo™
ImpliedDisconnect™
IntelliMAX™
ISOPLANAR™
LittleFET™
MICROCOUPLER™
MicroFET™
MicroPak™
MICROWIRE™
MSX™
MSXPro™
OCX™
OCXPro™
OPTOLOGIC®
OPTOPLANAR™
PACMAN™
POP™
Power247™
PowerEdge™
PowerSaver™
PowerTrench®
QFET®
QS™
QT Optoelectronics™
Quiet Series™
RapidConfigure™
RapidConnect™
µSerDes™
ScalarPump™
SILENT SWITCHER®
SMART START™
SPM™
Stealth™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SyncFET™
TinyLogic®
TINYOPTO™
TruTranslation™
UHC™
UltraFET®
UniFET™
VCX™
Wire™

Across the board. Around the world.™
The Power Franchise®
Programmable Active Droop™

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILDíS PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.
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, or (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 significant injury to the user.

2. A critical component is 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.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

Rev. I17