

FODM3062, FODM3063, FODM3082, FODM3083 4-Pin Full Pitch Mini-Flat Package Zero-Cross Triac Driver Output Optocouplers

Features

- dv/dt of 600V/μs guaranteed
- Compact 4-pin surface mount package (2.4mm maximum standoff height)
- Zero voltage crossing
- Peak blocking voltage: 600V (FODM306X) 800V (FODM308X)
- Available in tape and reel quantities of 2500
- C-UL, UL and VDE certifications pending

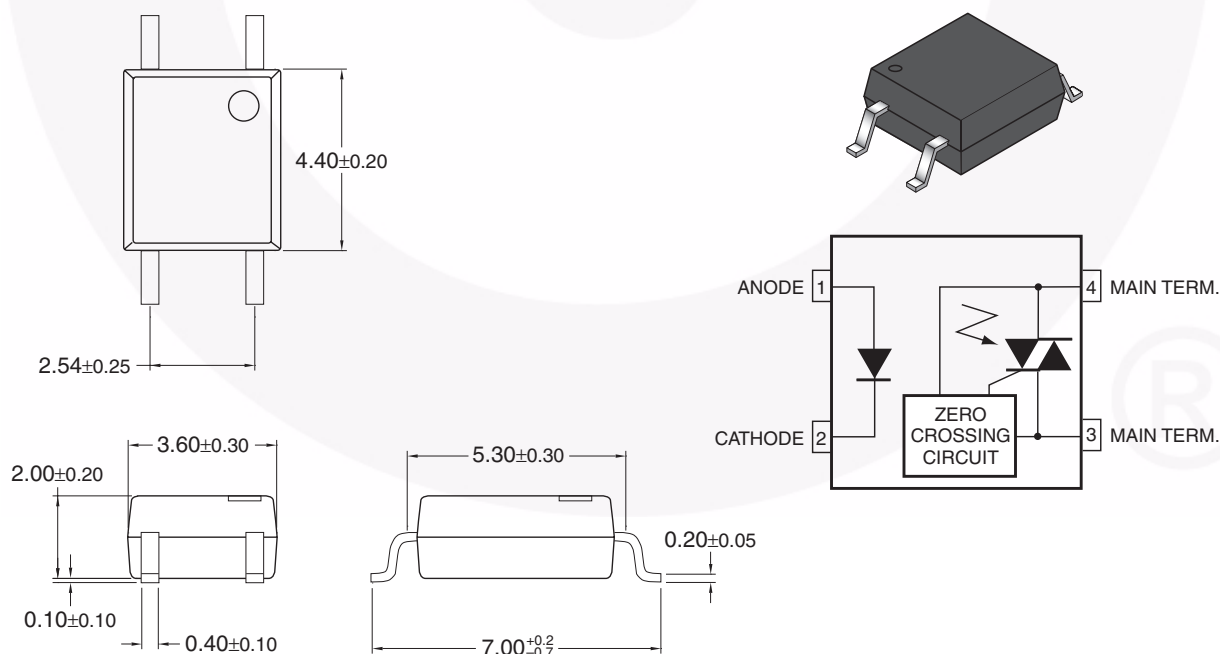
Applications

- Solenoid/valve controls
- Lighting controls
- Static power switches
- AC motor drives
- Temperature controls
- E.M. contactors
- AC motor starters
- Solid state relays

Description

The FODM306X and FODM308X series consist of an infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a zero voltage crossing bilateral triac driver, and is housed in a compact 4-pin mini-flat package. The lead pitch is 2.54mm. They are designed for use with a triac in the interface of logic systems to equipment powered from 115/240 VAC lines, such as solid state relays, industrial controls, motors, solenoids and consumer appliances.

Package Dimensions



Note:

All dimensions are in millimeters.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter		Rating	Units
TOTAL PACKAGE				
T _{STG}	Storage Temperature		-55 to +150	°C
T _{OPR}	Operating Temperature		-40 to +100	°C
EMITTER				
I _F (avg)	Continuous Forward Current		60	mA
I _F (pk)	Peak Forward Current (1μs pulse, 300pps.)		1	A
V _R	Reverse Input Voltage		6	V
P _D	Power Dissipation (No derating required over operating temp. range)		100	mW
DETECTOR				
I _{T(RMS)}	On-State RMS Current		70	mA (RMS)
V _{DRM}	Off-State Output Terminal Voltage	FODM3062/FODM3063	600	V
		FODM3082/FODM3083	800	
P _D	Power Dissipation (No derating required over operating temp. range)		300	mW

Electrical Characteristics ($T_A = 25^\circ\text{C}$)**Individual Component Characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.*	Max.	Units
EMITTER						
V_F	Input Forward Voltage	$I_F = 30\text{mA}$			1.5	V
I_R	Reverse Leakage Current	$V_R = 6\text{V}$			100	μA
DETECTOR						
I_{DRM1}	Peak Blocking Current, Either Direction	Rated V_{DRM} , $I_F = 0^{(1)}$			500	nA
dV/dt	Critical Rate of Rise of Off-State Voltage	$I_F = 0$ (Figure 1) ⁽²⁾	600			V/ μs

Transfer Characteristics

Symbol	DC Characteristics	Test Conditions	Device	Min.	Typ.*	Max.	Units
I_{FT}	LED Trigger Current	Main Terminal Voltage = $3\text{V}^{(3)}$	FODM3062			10	mA
			FODM3082				
			FODM3063			5	
			FODM3083				
I_H	Holding Current, Either Direction		All		300		μA
V_{TM}	Peak On-State Voltage, Either Direction	$I_F = \text{Rated } I_{\text{FT}}$, $I_{\text{TM}} = 100\text{mA peak}$	All			3	V

Zero Crossing Characteristics

Symbol	Characteristics	Test Conditions	Device	Min.	Typ.*	Max.	Units
V_{IH}	Inhibit Voltage, MT1-MT2 Voltage above which device will not trigger	$I_F = \text{Rated } I_{\text{FT}}$	All			20	V
I_{DRM2}	Leakage in Inhibit State	$I_F = \text{Rated } I_{\text{FT}}$, Rated V_{DRM} , Off-State	FODM3062 FODM3082			500	μA
			FODM3083			1000	

Isolation Characteristics

Characteristics	Test Conditions	Symbol	Device	Min.	Typ.*	Max.	Units
Steady State Isolation Voltage ⁽⁴⁾	(1 Minute) R.H. = 40% to 60%	V_{ISO}	All	3750			VRMS

*All typicals at 25°C .**Notes:**

1. Test voltage must be applied within dv/dt rating.
2. This is static dv/dt. See Figure 1 for test circuit. Commutating dv/dt is function of the load-driving thyristor(s) only.
3. All devices are guaranteed to trigger at an I_F value less than or equal to max I_{FT} . Therefore, recommended operating I_F lies between max I_{FT} (10mA for FODM3062/82, 5mA for FODM3063/83) and absolute max I_F (60 mA).
4. Steady state isolation voltage, V_{ISO} , is an internal device dielectric breakdown rating. For this test, pins 1 & 2 are common, and pins 3 & 4 are common.

Typical Performance Curves

Fig. 1 LED Forward Voltage vs. Forward Current

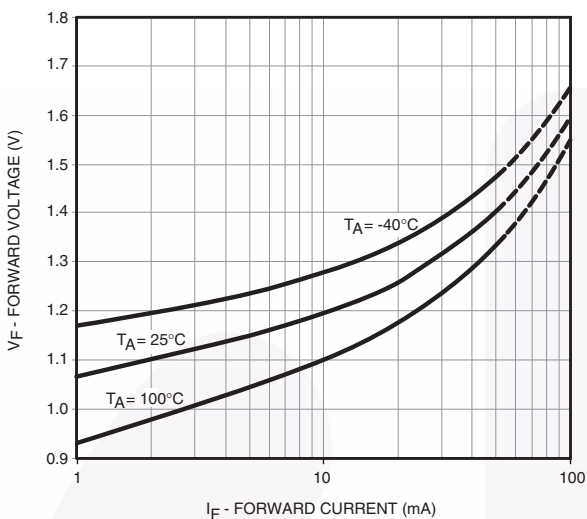


Fig. 2 Leakage Current vs. Ambient Temperature

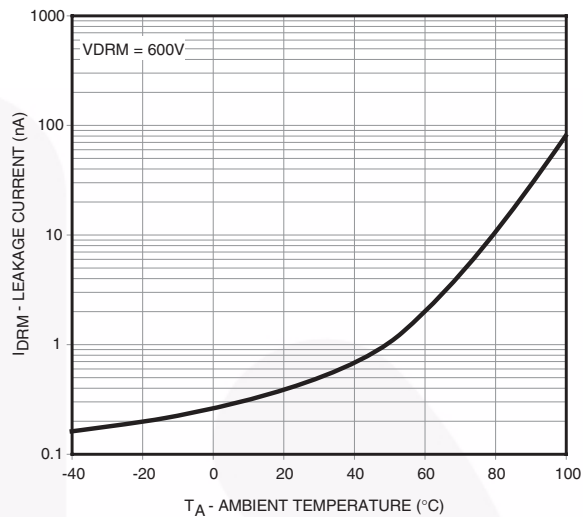


Fig. 3 Holding Current vs. Ambient Temperature

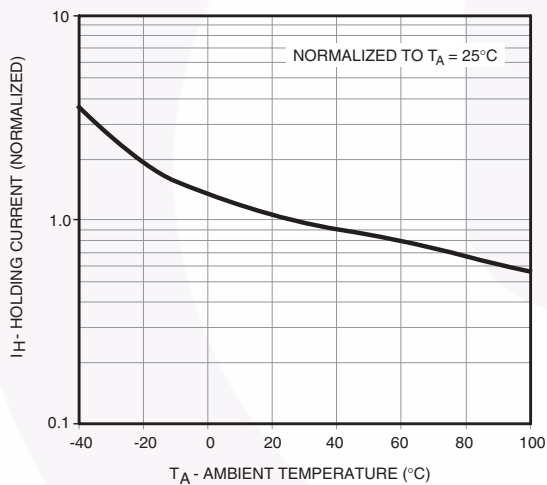
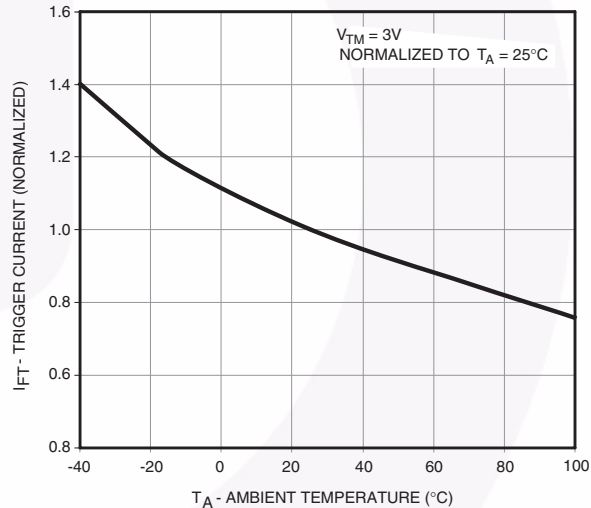


Fig. 4 Trigger Current vs. Ambient Temperature



Typical Performance Curves (Continued)

Fig. 5 LED Current Required to Trigger vs. LED Pulse Width

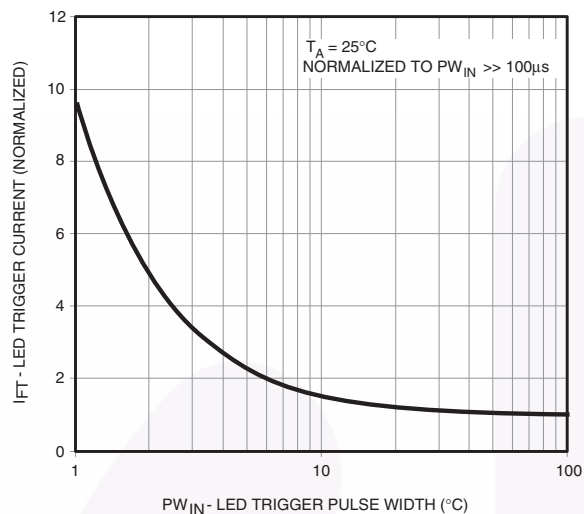


Fig. 6 Off-State Output Terminal Voltage vs. Ambient Temperature

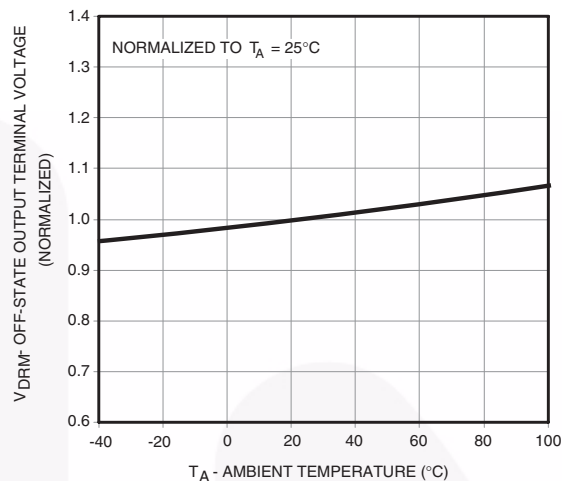
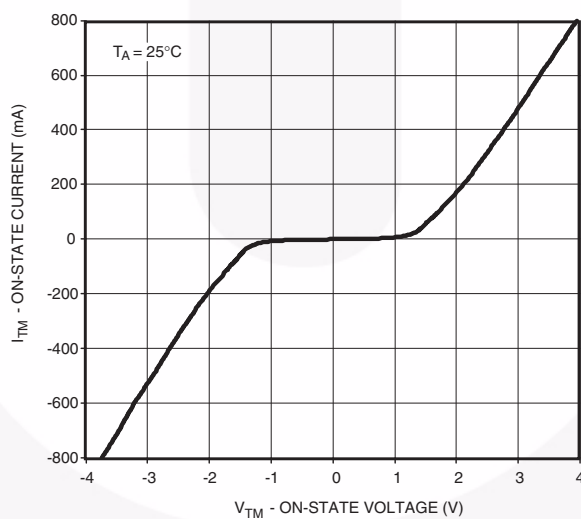


Fig. 7 On-State Characteristics



Typical Applications

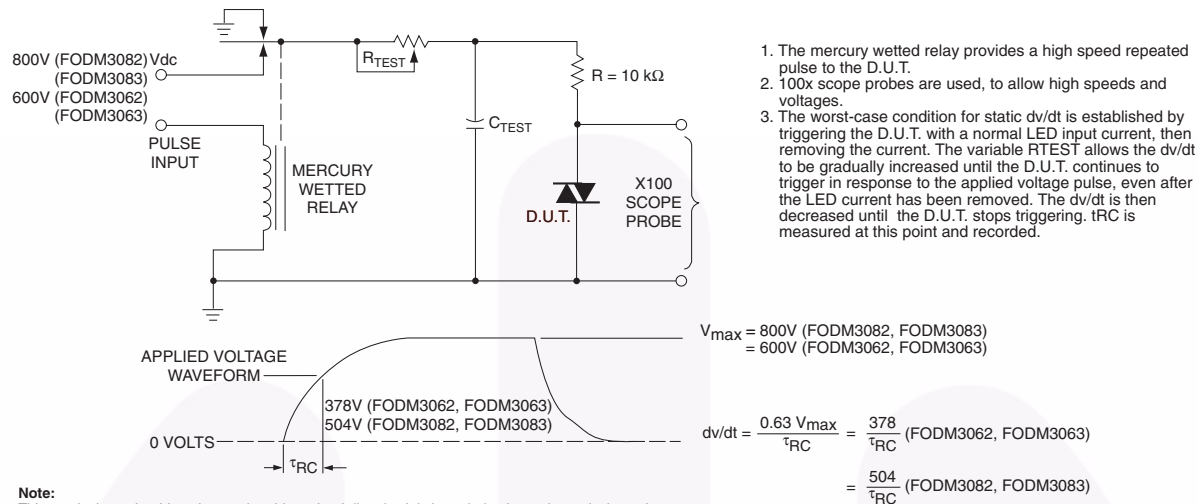


Figure 8. Static dv/dt Test Circuit

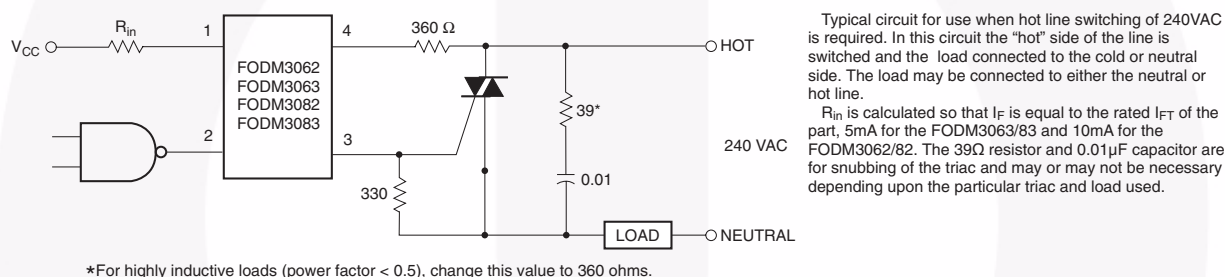


Figure 9. Hot-Line Switching Application Circuit

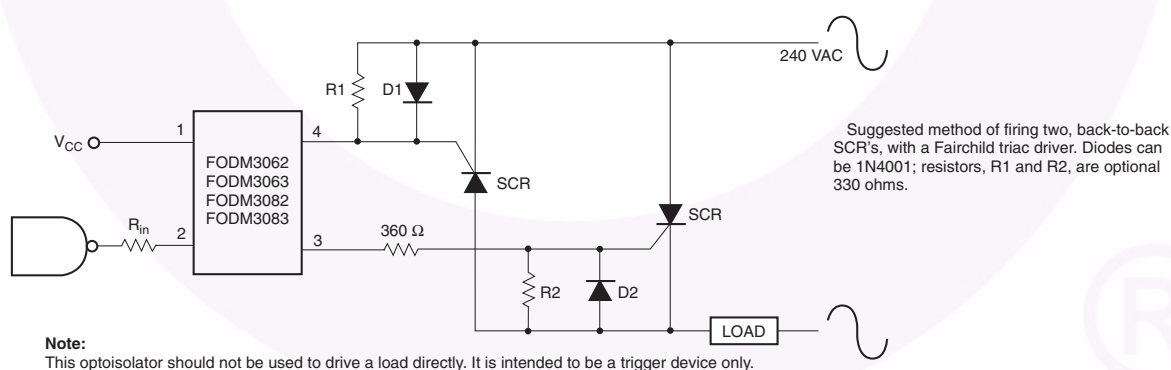
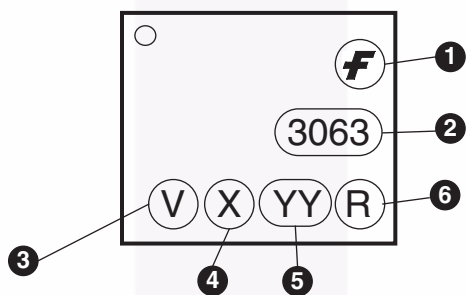


Figure 10. Inverse-Parallel SCR Driver Circuit (240VAC)

Ordering Information

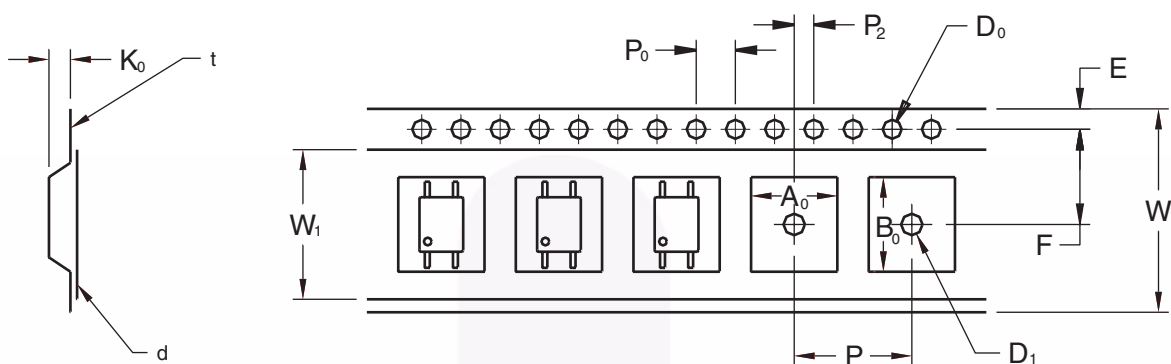
Option	Description
No option	Bulk (100 units/tube)
V	VDE Approved
R2	Tape and Reel (2500 units)
R2V	Tape and Reel (2500 units) and VDE Approved

Marking Information



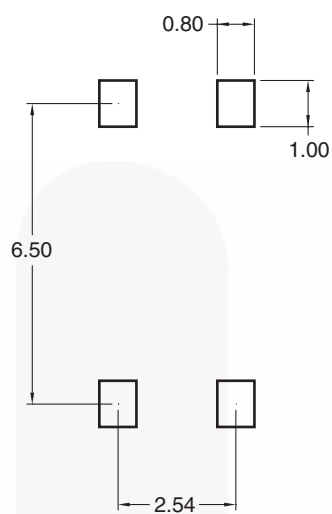
Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

Tape and Reel Information



		2.54 Pitch
Description	Symbol	Dimensions
Tape Width	W	12.00 ± 0.4
Tape Thickness	t	0.35 ± 0.02
Sprocket Hole Pitch	P_0	4.00 ± 0.20
Sprocket Hole Dia.	D_0	1.55 ± 0.20
Sprocket Hole Location	E	1.75 ± 0.20
Pocket Location	F	5.50 ± 0.20
	P_2	2.00 ± 0.20
Pocket Pitch	P	8.00 ± 0.20
Pocket Dimension	A_0	4.75 ± 0.20
	B_0	7.30 ± 0.20
	K_0	2.30 ± 0.20
Pocket Hole Dia.	D_1	1.55 ± 0.20
Cover Tape Width	W_1	9.20
Cover Tape Thickness	d	0.065 ± 0.02
Max. Component Rotation or Tilt		20° max
Devices Per Reel		2500
Reel Diameter		330 mm (13")

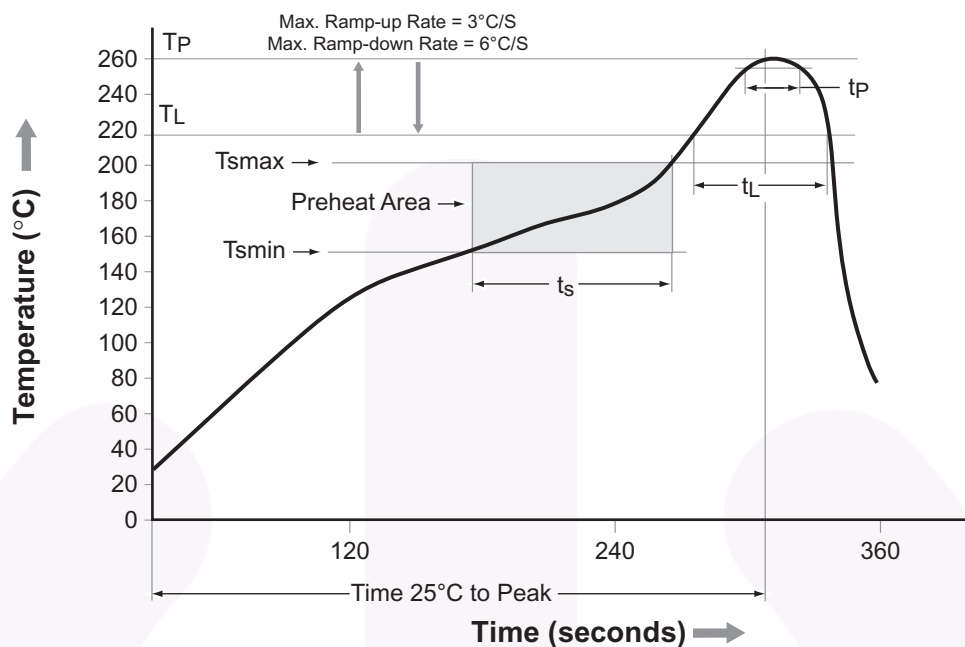
Footprint Drawing for PCB Layout



Note:
All dimensions are in mm.



Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60–120 seconds
Ramp-up Rate (t _L to t _p)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60–150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t _p) within 5°C of 260°C	30 seconds
Ramp-down Rate (T _p to T _L)	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.



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Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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