

# FAN6250M6X



## Description

The FAN6250M6X is a secondary-side synchronous rectifier (SR) controller for an isolated flyback converter operating in Discontinuous Conduction Mode (DCM). The adaptive dead time control algorithm minimizes the body diode conduction of SR MOSFET while guaranteeing stable and robust SR operation against noise and disturbance caused by the circuit parasitic.

Programmable thermal Shut-Down (SD) function that is informing primary side controller to shut-down the power system when pairing with PSR controller – FAN1080. The Dynamic Response Enhancement (DRE) function that minimizes system response time when pairing with PSR controller – FAN1080.

## Features

- Works in Discontinuous Conduction Modes (DCM) and Boundary Conduction Modes (BCM)
- Adaptive Turn-off Trigger Blanking Time for Wide SR MOSFET Application
- Gate Turn-on Blanking Time (minimum Gate OFF Time)
- Dynamic Response Enhancement (DRE) Function that minimizes System Response Time
- Programmable Shut-Down (SD) Protection
- Minimum Turn-on Delay (20 ns)
- Input Voltage (VIN) Range for LDO Input: 3.25 V to 20 V
- Fewest External Components Allowed
- Accurate Turn Off Dead Time Regulation when working with PSR Power System
- Small Footprint: SOT-23 6 Pin
- This is a Pb-Free Device

## Typical Applications

- Travel Adapter for Smart Phones, Feature Phones, and Tablet PCs
- AC-DC Adapters for Portable Devices that Require CV/CC Control

## ORDERING INFORMATION

Part Number	Operating Temperature	Package	Packing Method†
FAN6250M6X	-40°C to 125°C	6 Lead, SOT23 (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

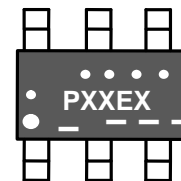


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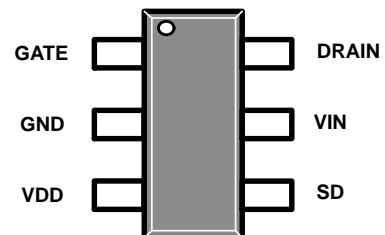
SOT-23, 6 Lead  
CASE 527AJ

## MARKING DIAGRAM



... = Year Code  
PXX = 250 : FAN6250  
E X = Die Run Code  
— — = Date Code

## PIN CONNECTIONS



# FAN6250M6X



Figure 1. FAN6250 Typical Application Schematic

# FAN6250M6X

Table 1. PIN FUNCTION DESCRIPTION

Pin #	Name	Description
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# FAN6250M6X

**Table 5. ELECTRICAL CHARACTERISTICS**

$V_{IN} = 5.5\text{ V}$  and  $T_A = -40$  to  $125^\circ\text{C}$  unless noted otherwise

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>VDD Section</b>						
Turn-On Threshold	$V_{IN}$ rising	$V_{IN-ON}$	3.06	3.15	3.25	V
Turn-Off Threshold	$V_{IN}$ falling	$V_{IN-OFF}$	2.78	2.9	3.05	V
Operating Current	$f_{SW} = 100\text{ kHz}$ , $C_{GATE} = 3.3\text{ nF}$ , $V_{IN} = 5\text{ V}$	$I_{IN-OP}$		2.0	2.8	mA

**Power Supply Section**

Internal LDO Output Voltage

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**Table 5. ELECTRICAL CHARACTERISTICS** (continued)

$V_{IN} = 5.5\text{ V}$  and  $T_A = -40$  to  $125^\circ\text{C}$  unless noted otherwise

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>Shut-Down Section</b>						
Threshold voltage for Shut-Down function triggered		$V_{SD-TH}$	0.97	1.00	1.03	V
Shut-Down current source		$I_{SD-TH}$	44	50	56	$\mu\text{A}$
Impedance for Shut-Down trigger		$Z_{SD-TH}$	18.48	20.00	21.68	$\text{k}\Omega$
Denounce Cycles for Shut-Down		$N_{SD-Debounce}$		7		Cycles
<b>Output Driver Section</b>						
Output Voltage Low	$V_{IN} = 6\text{ V}$	$V_{OL}$			0.25	V
Output Voltage High	$V_{IN} = 6\text{ V}$	$V_{OH}$	4.9			V
Rise Time	$V_{IN} = 6\text{ V}$ , $C_L = 3300\text{ pF}$ , GATE = 1 V ~ 4 V	$t_R$			90	ns
Fall Time	$V_{IN} = 6\text{ V}$ , $C_L = 3300\text{ pF}$ , GATE = 4 V ~ 1 V	$t_F$			30	ns

4. Guaranteed by Design.
5. Specification operation temperature range  $-5^\circ\text{C} \sim 85^\circ\text{C}$
6. Specification operation temperature range  $-5^\circ\text{C} \sim 50^\circ\text{C}$

**FAN6250M6X**

# FAN6250M6X

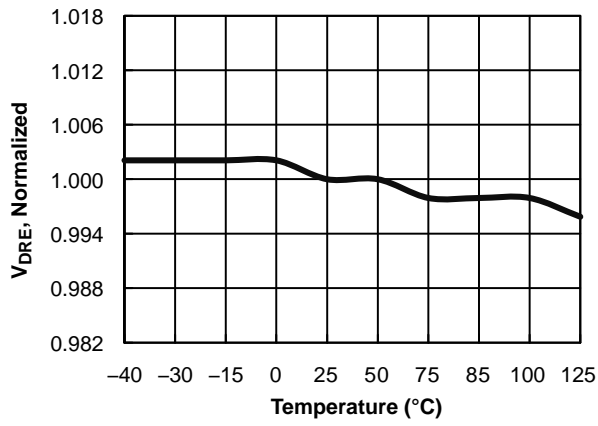


Figure 9. VIN Pin DRE Function Trigger Level (V<sub>DRE</sub>) vs. Temperature

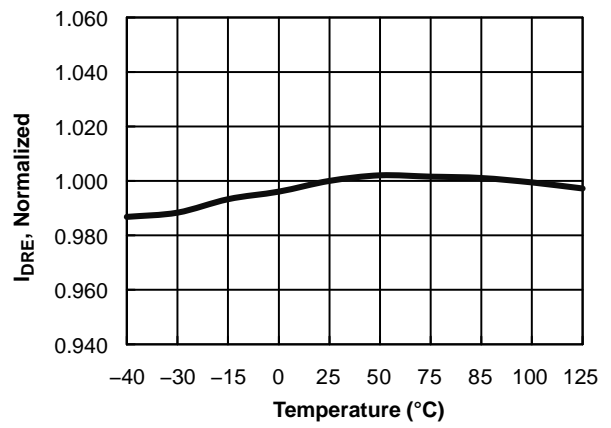


Figure 10. Drain Pin Sinking Current for DRE Triggered (I<sub>DRE</sub>) vs. Temperature

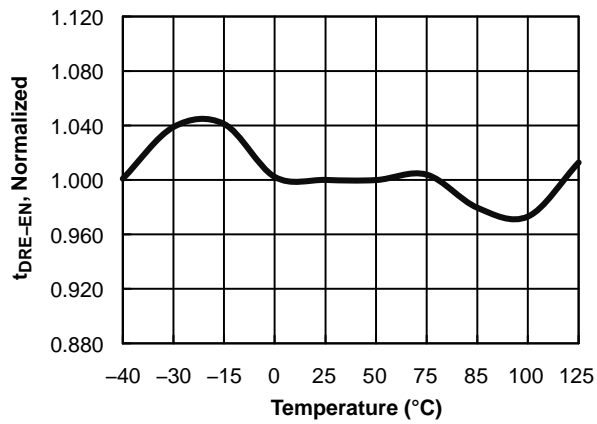


Figure 11. DRE Function Enable Period (t<sub>DRE-EN</sub>) vs. Temperature

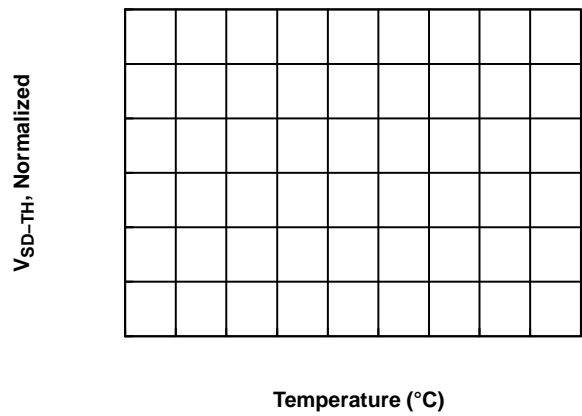
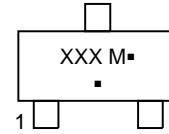
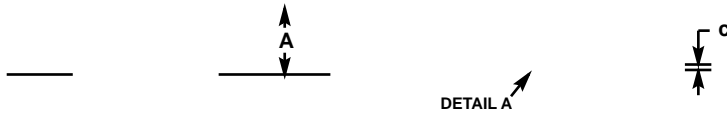
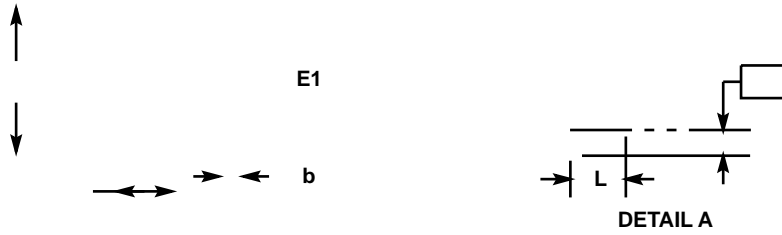


Figure 12. Shut-Down Threshold Voltage (V<sub>SD-TH</sub>) vs. Temperature

**SOT-23, 6 Lead**  
CASE 527AJ

SCALE 2:1



- XXX = Specific Device Code
- M = Date Code
- = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "



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