



Is Now Part of



**ON Semiconductor®**

To learn more about ON Semiconductor, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (\_), the underscore (\_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (\_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at [www.onsemi.com](http://www.onsemi.com). Please email any questions regarding the system integration to [Fairchild\\_questions@onsemi.com](mailto:Fairchild_questions@onsemi.com).

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.



## SG5842A/SG5842JA — Highly Integrated Green-Mode PWM Controller

### Features

- Green-Mode PWM Controller
- Low Startup Current: 14 $\mu$ A
- Low Operating Current: 4mA
- Programmable PWM Frequency with Hopping (SG5842JA)
- Peak-Current-Mode Control
- Cycle-by-Cycle Current Limiting
- Synchronized Slope Compensation
- Leading-Edge Blanking (LEB)
- Constant Output Power Limit
- Totem-Pole Output with Soft Driving
- $V_{DD}$  Over-Voltage Protection (OVP)
- Programmable Over-Temperature Protection (OTP)
- Internal Latch Circuit (OTP, OVP)
- Internal Open-Loop Protection
- $V_{DD}$  Under-Voltage Lockout (UVLO)
- GATE Output Maximum Voltage Clamp: 18V

### Applications

General-purpose switch-mode power supplies and flyback power converters, including:

- Notebook Power Adapters
- Open-Frame SMPS

### Description


The highly integrated SG5842A/JA series of PWM controllers provides several features to enhance the performance of flyback converters. To minimize standby power consumption, a proprietary green-mode function provides off-time modulation to continuously decrease the switching frequency at light-load conditions. To avoid acoustic-noise problems, the minimum PWM frequency set above 22KHz. This green-mode function enables the power supply to meet international power conservation requirements. To further reduce power consumption, SG5842A/JA is manufactured using the BiCMOS process. This allows a low startup current, around 14 $\mu$ A, and an operating current of only 4mA. As a result, a large startup resistance can be used.

The SG5842A/JA built-in synchronized slope compensation achieves stable peak-current-mode control. SG5842JA integrates a frequency-hopping function that helps reduce EMI emission of a power supply with minimum line filters.

SG5842A/JA provides many protection functions. In addition to cycle-by-cycle current limiting, the internal open-loop protection circuit ensures safety should an open-loop or output short-circuit failure occur. PWM output is disabled until  $V_{DD}$  drops below the UVLO lower limit, then the controller starts again. As long as  $V_{DD}$  exceeds about 24V, the internal OVP circuit is triggered. An external NTC thermistor can be applied for over-temperature protection.

SG5842A/JA is available in an 8-pin DIP or SOP package.

### Ordering Information

Part Number	Operating Temperature Range	 Eco Status	Package	OTP Latch	OVP Latch	Frequency Hopping
SG5842JASZ	-40°C to +105°C	RoHS	8-Pin Small Outline Package (SOP)	Yes	Yes	Yes
SG5842JADZ	-40°C to +105°C	RoHS	8-Pin Dual Inline Package (DIP)	Yes	Yes	Yes
SG5842JASY	-40°C to +105°C	Green	8-Pin Small Outline Package (SOP)	Yes	Yes	Yes
SG5842ASZ (Preliminary)	-40°C to +105°C	RoHS	8-Pin Small Outline Package (SOP)	Yes	Yes	No
SG5842ASY (Preliminary)	-40°C to +105°C	Green	8-Pin Small Outline Package (SOP)	Yes	Yes	No

 For Fairchild's definition of Eco Status, please visit: [http://www.fairchildsemi.com/company/green/rohs\\_green.html](http://www.fairchildsemi.com/company/green/rohs_green.html).

### Application Diagram

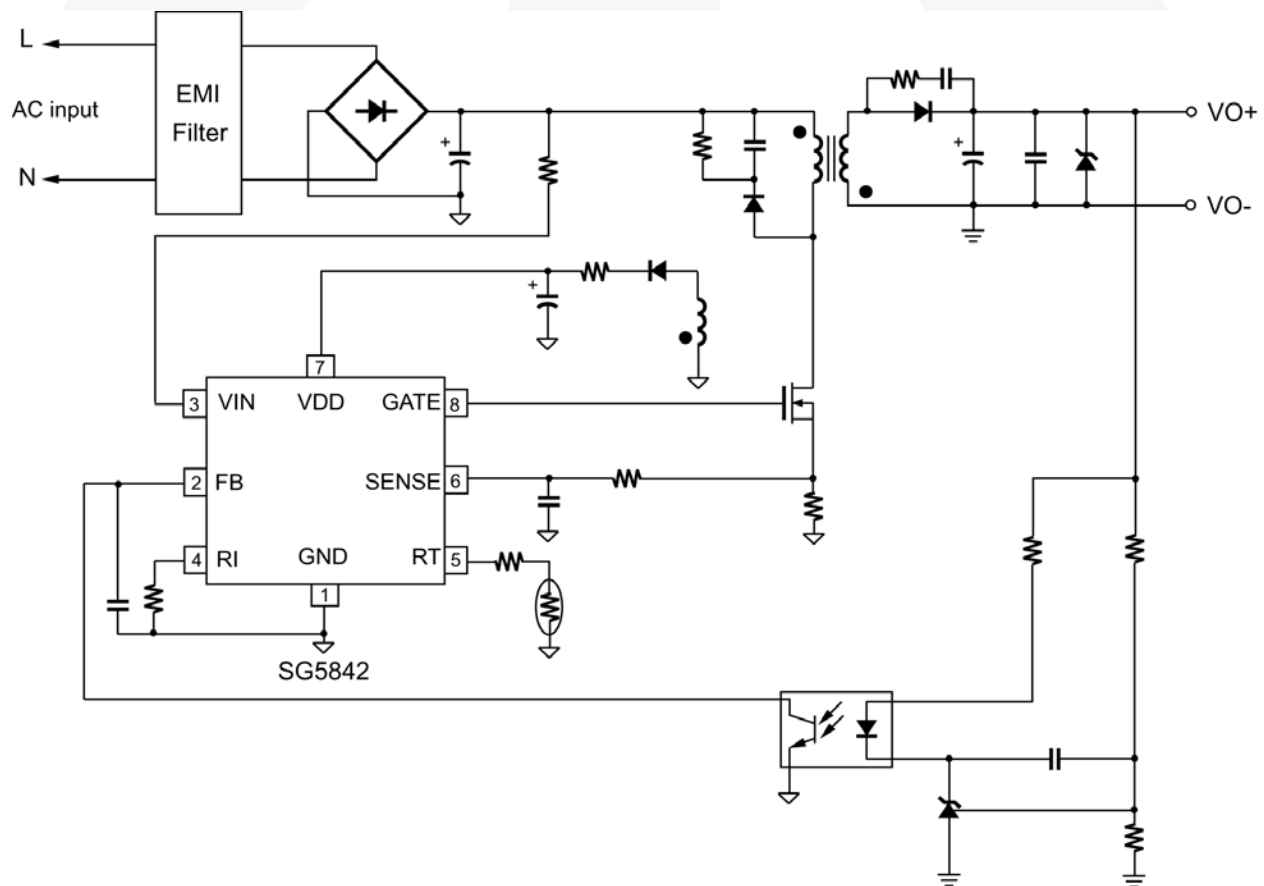


Figure 1. Application Diagram

### Block Diagram

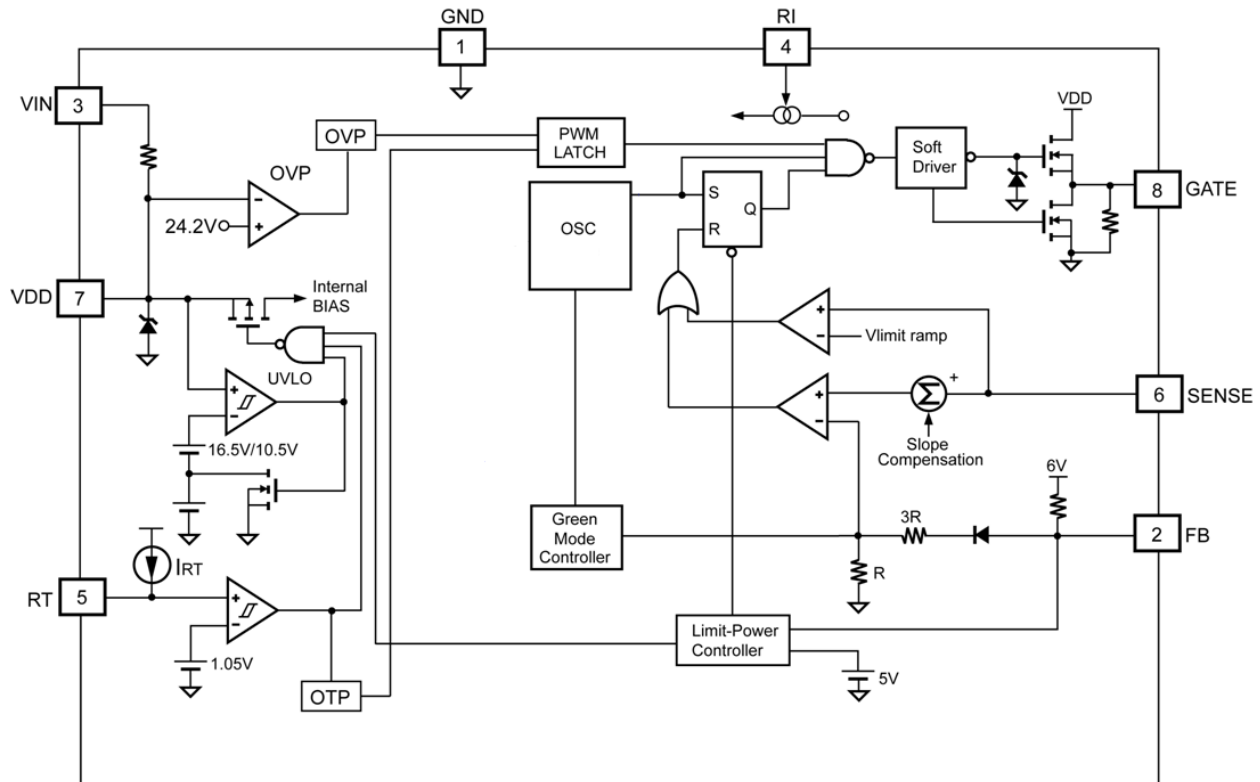


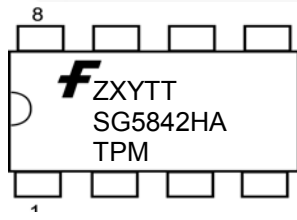
Figure 2. Function Block Diagram

### Marking Information



Marking for SG5842JASZ (pb-free)  
 Marking for SG5842JADZ (pb-free)  
 Marking for SG5842ASZ (pb-free)  
 Marking for SG5842ADZ (pb-free)

H: J = with Frequency Hopping  
 Null = without Frequency Hopping  
 T: D = DIP, S = SOP  
 P: Z = Lead Free  
 Null = Regular Package  
 XXXXXXXX: Wafer Lot  
 Y: Year; WW: Week  
 V: Assembly Location



Marking for SG5842JASY (green-compound)  
 Marking for SG5842ASY (green-compound)

F- Fairchild Logo  
 Z- Plant Code  
 X- 1 Digit Year Code  
 Y- 1 Digit week Code  
 TT: 2 Digits Die Run Code  
 T: Package Type (S=SOP, D=DIP)  
 P: Y: Green Package  
 M: Manufacture Flow Code

Figure 3. Top Mark

## Pin Configuration

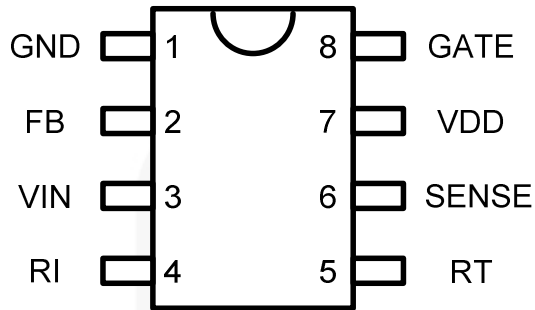


Figure 4. Pin Configuration

## Pin Definitions

Pin #	Name	Description
1	GND	Ground
2	FB	The signal from the external compensation circuit is fed into this pin. The PWM duty cycle is determined in response to the signal from this pin and the current-sense signal from Pin 6. If FB voltage exceeds the threshold, the internal protection circuit disables PWM output after a predetermined delay time.
3	VIN	For startup, this pin is pulled HIGH to the rectified line input via a resistor. Since the startup current requirement is very small, a large startup resistance can be used to minimize power loss.
4	RI	A resistor connected from the RI pin to GND provides a constant current source. This determines the center PWM frequency. Increasing the resistance reduces PWM frequency. Using a 26KΩ resistor results in a 65KHz center PWM frequency.
5	RT	For over-temperature protection. An external NTC thermistor is connected from this pin to the GND pin. The impedance of the NTC decreases at high temperatures. Once the voltage of the RT pin drops below a fixed limit, PWM output is latched off.
6	SENSE	Current sense. The sensed voltage is used for peak-current-mode control and cycle-by-cycle current limiting.
7	VDD	Power supply. The internal protection circuit disables PWM output if V <sub>DD</sub> is over-voltage.
8	GATE	The totem-pole output driver for the power MOSFET, which is internally clamped below 18V.

## Absolute Maximum Ratings

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	Min.	Max.	Unit
V <sub>VDD</sub>	Supply Voltage <sup>(1)</sup>		30	V
V <sub>VIN</sub>	Input Terminal		30	V
V <sub>FB</sub>	Input Voltage to FB Pin	-0.3	7.0	V
V <sub>SENSE</sub>	Input Voltage to SENSE Pin	-0.3	7.0	V
V <sub>RT</sub>	Input Voltage to RT Pin	-0.3	7.0	V
V <sub>RI</sub>	Input Voltage to RI Pin	-0.3	7.0	V
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> < 50°C )		DIP 800	mW
			SOP 400	
θ <sub>JA</sub>	Thermal Resistance (Junction-to-Air)		DIP 82.5	°C/W
			SOP 141	
T <sub>J</sub>	Operating Junction Temperature	-40	+125	°C
T <sub>STG</sub>	Storage Temperature Range	-55	+150	°C
T <sub>L</sub>	Lead Temperature (Wave Soldering or Infrared, 10 Seconds)		+260	°C
ESD	Electrostatic Discharge Capability		Human Body Model, JESD22-A114	KV
			Charged Device Model, JESD22-C101	

### Notes:

- All voltage values, except differential voltage, are given with respect to GND pin.
- Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.

## Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Min.	Max.	Unit
T <sub>A</sub>	Operating Ambient Temperature	-20	+85	°C

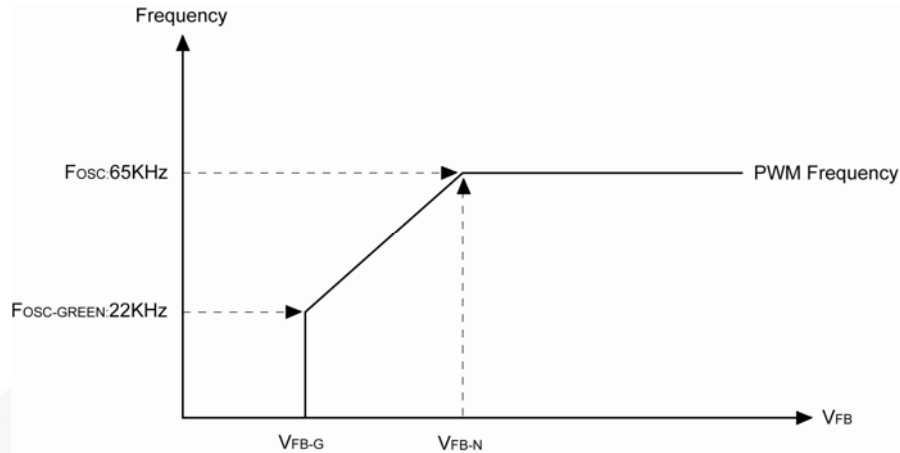
## Electrical Characteristics

$V_{DD}=15V$  and  $T_J=T_A= -40\sim 125^{\circ}C$ , unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units	
<b>V<sub>DD</sub> Section</b>							
$V_{DD-OP}$	Continuously Operating Voltage				20	V	
$V_{DD-ON}$	Start Threshold Voltage		15.5	16.5	17.5	V	
$V_{DD-OFF}$	Minimum Operation Voltage		9.5	10.5	11.5	V	
$I_{DD-ST}$	Startup Current	$V_{DD}=V_{DD-ON}-0.16V$		14	30	$\mu A$	
$I_{DD-OP}$	Operating Supply Current	$V_{DD}=15V, R_I=26K\Omega, GATE=OPEN$		4	5	mA	
$V_{DD-OVP}$	$V_{DD}$ Over-Voltage Protection		23.2	24.2	25.2	V	
$t_{D-OVP}$	$V_{DD}$ Over-Voltage Protection Debounce Time	$R_I=26K\Omega$		100		$\mu s$	
$I_{DD-H}$	Holding Current After OVP/OTP Latchup	$V_{DD}=5V$	40.0	52.5	65.0	$\mu A$	
<b>RI Section</b>							
$R_{I-NOR}$	$R_I$ Operating Range		15.5		36.0	K $\Omega$	
$R_{I-MAX}$	Maximum $R_I$ Value for Protection			230		K $\Omega$	
$R_{I-MIN}$	Minimum $R_I$ Value for Protection			10		K $\Omega$	
<b>Oscillator Section</b>							
$f_{OSC}$	Normal PWM Frequency	Center Frequency	$R_I=26K\Omega$	62	65	68	KHz
		Hopping Range	$R_I=26K\Omega$ SG5842JA Only	$\pm 3.7$	$\pm 4.2$	$\pm 4.7$	
$t_{HOP}$	Hopping Period		$R_I=26K\Omega$ SG5842JA Only	3.9	4.4	4.9	ms
$f_{OSC-G}$	Green-Mode Minimum Frequency		$R_I=26K\Omega$	18	22	25	KHz
$f_{DV}$	Frequency Variation vs. $V_{DD}$ Deviation		$V_{DD}=11.5V$ to 20V			5	%
$f_{DT}$	Frequency Variation vs. Temperature Deviation		$T_A=-20$ to $85^{\circ}C$			5	%
<b>Feedback Input Section</b>							
$A_V$	FB Input to Current Comparator Attenuation		1/4.5	1/4.0	1/3.5	V/V	
$Z_{FB}$	Input Impedance		4		7	K $\Omega$	
$V_{FB-OPEN}$	Output High Voltage	FB Pin Open	5.5			V	
$V_{FB-OLP}$	FB Open-Loop Trigger Level		5.0		5.4	V	
$t_{D-OLP}$	FB Open-Loop Protection Delay	$R_I=26K\Omega$	50	56	62	ms	
$V_{FB-N}$	Green-Mode Entry FB Voltage	$R_I=26K\Omega$	1.9	2.1	2.3	V	
$V_{FB-G}$	Green-Mode Ending FB Voltage	$R_I=26K\Omega$		$V_{FB-N}-0.5$		V	

Continued on the following page...

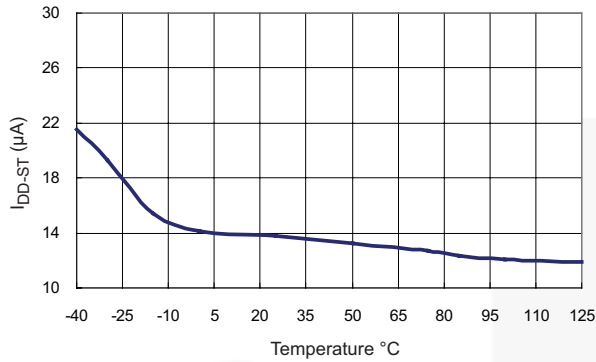
**Electrical Characteristics** (Continued)

 $V_{DD} = 15V$  and  $T_J = T_A = -40 \sim 125^\circ C$ , unless otherwise noted.

**Figure 5.  $V_{FB}$  vs. PWM Frequency**

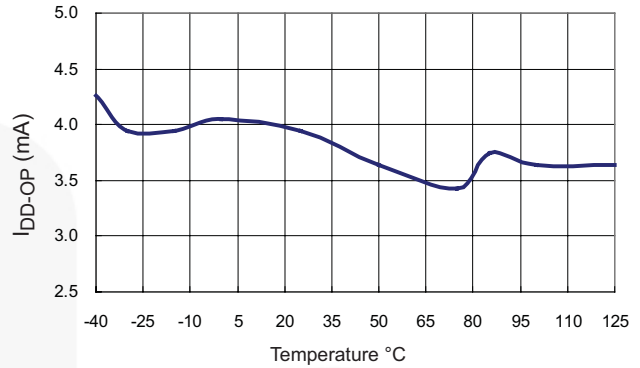
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
<b>Current Sense Section</b>						
$Z_{SENSE}$	Input Impedance			12		K $\Omega$
$V_{STHFL}$	Current Limit Flatten Threshold Voltage		0.85	0.90	0.95	V
$V_{STHVA}$	Current Limit Valley Threshold Voltage	$V_{STHFL} - V_{STHVA}$		0.22		V
$DCY_{SAW}$	Duty Cycle of SAW Limit	Maximum Duty Cycle		45		%
$t_{PD}$	Propagation Delay to GATE Output	$R_I = 26K\Omega$		150	200	ns
$t_{LEB}$	Leading-Edge Blanking Time	$R_I = 26K\Omega$	200	270	350	ns
<b>GATE Section</b>						
$DCY_{MAX}$	Maximum Duty Cycle		60	65	70	%
$V_{GATE-L}$	Output Voltage Low	$V_{DD} = 15V, I_O = 50mA$			1.5	V
$V_{GATE-H}$	Output Voltage High	$V_{DD} = 12.5V, I_O = -50mA$	7.5			V
$t_r$	Rising Time	$V_{DD} = 15V, C_L = 1nF$	150	250	350	ns
$t_f$	Falling Time	$V_{DD} = 15V, C_L = 1nF$	30	50	90	ns
$I_O$	Peak Output Current	$V_{DD} = 15V, GATE = 6V$	230			mA
$V_{GATE-CLAMP}$	Gate Output Clamping Voltage	$V_{DD} = 20V$		18	19	V
<b>RT Section</b>						
$I_{RT}$	Output Current of RT Pin	$R_I = 26K\Omega$	67	70	73	$\mu A$
$V_{RTTH}$	Over-Temperature Protection Threshold Voltage		1.015	1.050	1.085	V
$t_{D-OTP}$	Over-Temperature Debounce	$R_I = 26K\Omega$	60	100	140	$\mu s$



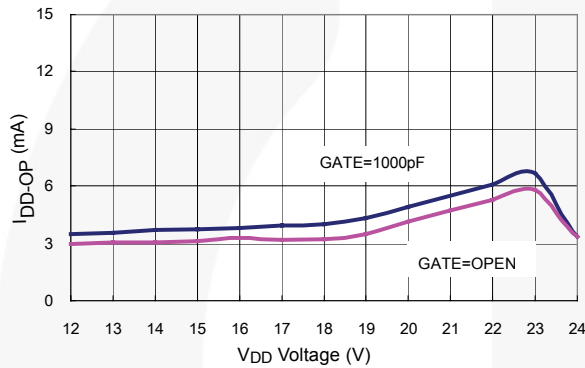
## Performance Characteristics



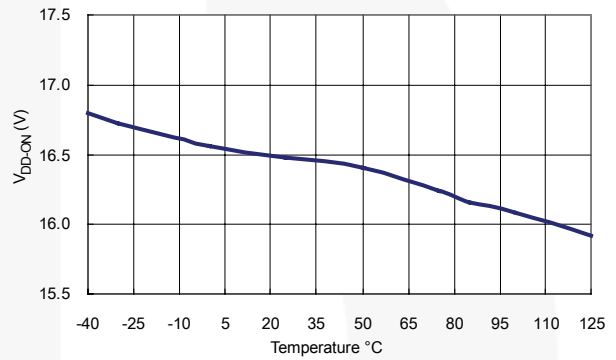
**Figure 6. Startup Current ( $I_{DD-ST}$ ) vs. Temperature**



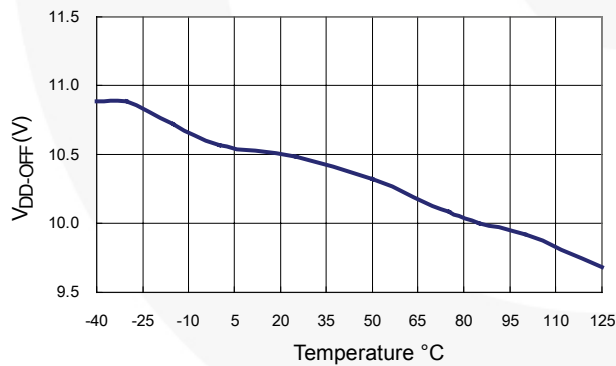
**Figure 7. Operating Supply Current ( $I_{DD-OP}$ ) vs. Temperature**



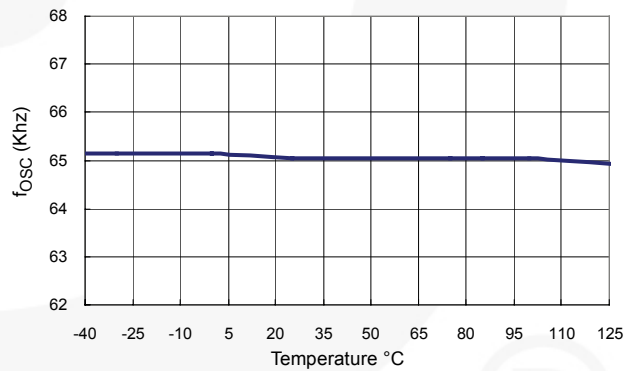
**Figure 8. Operation Current ( $I_{DD-OP}$ ) vs.  $V_{DD}$  Operation**



**Figure 9. Start Threshold ( $V_{DD-ON}$ ) vs. Temperature**



**Figure 10. Minimum Operating Voltage ( $V_{DD-OFF}$ ) vs. Temperature**



**Figure 11. PWM Frequency ( $f_{osc}$ ) vs. Temperature**

Performance Characteristics (Continued)

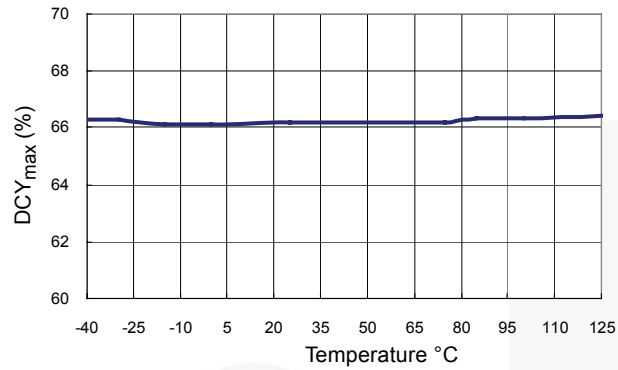


Figure 12. Maximum Duty Cycle (DCY<sub>max</sub>) vs. Temperature

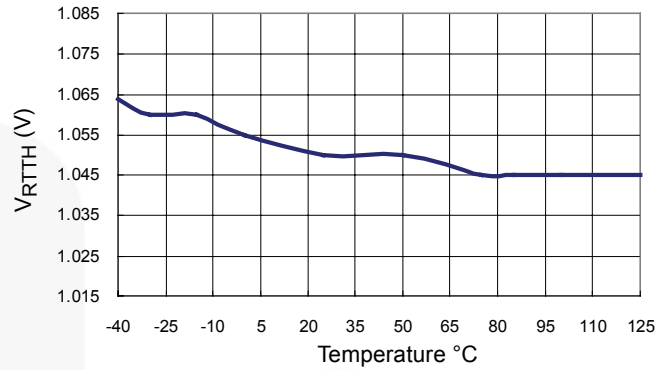


Figure 13. Trigger Voltage for Over-Temperature Protection (V<sub>RTTH</sub>) vs. Temperature

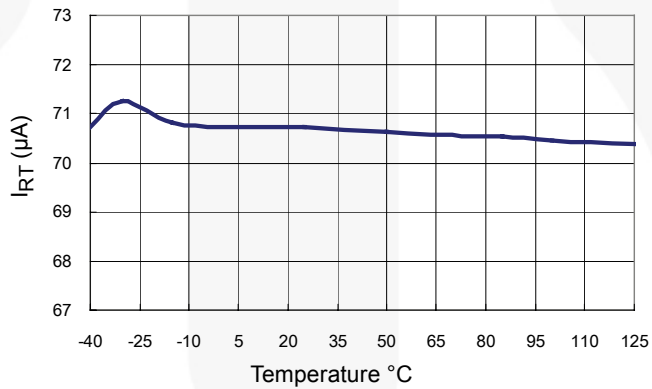


Figure 14. Output Current of RT Pin (I<sub>RT</sub>) vs. Temperature

## Functional Description

### Startup Current

The typical startup current is only 14 $\mu$ A, which allows a high-resistance, low-wattage startup resistor to be used to minimize power loss. A 1.5M $\Omega$ /0.25W startup resistor and a 10 $\mu$ F/25V  $V_{DD}$  hold-up capacitor are sufficient for an AC/DC adapter with a universal input range.

### Operating Current

The required operating current has been reduced to 4mA. This results in higher efficiency and reduces the  $V_{DD}$  hold-up capacitance requirement.

### Green-Mode Operation

The proprietary green-mode function provides off-time modulation to continuously decrease the PWM frequency under light-load conditions. To avoid acoustic noise problems, the minimum PWM frequency is set above 22KHz. This green-mode function dramatically reduces power consumption under light-load and zero-load conditions. Power supplies using this controller can meet even the strictest international standby power regulations.

### Oscillator Operation

A resistor connected from the RI pin to the GND pin generates a constant current source for the controller. This current is used to determine the center PWM frequency. Increasing the resistance reduces PWM frequency. Using a 26K $\Omega$  resistor,  $R_I$ , results in a corresponding 65KHz PWM frequency. The relationship between  $R_I$  and the switching frequency is:

$$f_{PWM} = \frac{1690}{R_I \text{ (K}\Omega\text{)}} \text{ (KHz)} \quad (1)$$

The range of the PWM oscillation frequency is designed as 47KHz ~ 109KHz.

SG5842JA also integrates a frequency hopping function internally. The frequency variation ranges from around 62KHz to 68KHz for a center frequency of 65KHz. The frequency hopping function helps reduce EMI emission of a power supply with minimum line filters.

### Leading-Edge Blanking (LEB)

Each time the power MOSFET is switched on, a turn-on spike occurs at the sense resistor. To avoid premature termination of the switching pulse, a leading-edge blanking time is built in. During this blanking period, the current-limit comparator is disabled and cannot switch off the gate drive.

### Under-Voltage Lockout (UVLO)

The turn-on/turn-off thresholds are fixed internally at 16.5V/10.5V. To enable a SG5842A/JA controller during startup, the hold-up capacitor must first be charged to 16.5V through the startup resistor.

The hold-up capacitor continues to supply  $V_{DD}$  before energy can be delivered from the auxiliary winding of the main transformer.  $V_{DD}$  must not drop below 10.5V during this startup process. This UVLO hysteresis window ensures that the hold-up capacitor can adequately supply  $V_{DD}$  during startup.

### Gate Output / Soft Driving

The SG5842A/JA BiCMOS output stage is a fast totem-pole gate driver. Cross-conduction has been avoided to minimize heat dissipation, increase efficiency, and enhance reliability. The output driver is clamped by an internal 18V Zener diode to protect the power MOSFET transistors from harmful over-voltage gate signals. A soft-driving waveform is implemented to minimize EMI.

### Slope Compensation

The sensed voltage across the current sense resistor is used for peak-current-mode control and cycle-by-cycle current limiting. The built-in slope compensation function improves power supply stability and prevents peak-current-mode control from causing sub-harmonic oscillations. Within every switching cycle, the SG5842A/JA controller produces a positively sloped, synchronized ramp signal.

### Constant Output Power Limit

When the SENSE voltage across the sense resistor,  $R_S$ , reaches the threshold voltage, around 0.85V; the output GATE drive is turned off after a small delay,  $t_{PD}$ . This delay introduces additional current proportional to  $t_{PD} \cdot V_{IN} / L_P$ . The delay is nearly constant regardless of the input voltage  $V_{IN}$ . Higher input voltage results in a larger additional current and the output power limit is higher than under low input line voltage. To compensate this variation for a wide AC input range, a sawtooth power-limiter (saw limiter) is designed to solve the unequal power-limit problem. The saw limiter is designed as a positive ramp signal ( $V_{LIMIT\_RAMP}$ ) fed to the inverting input of the OCP comparator. This results in a lower current limit at high-line inputs than at low-line inputs.

### $V_{DD}$ Over-Voltage Protection (OVP)

$V_{DD}$  over-voltage protection is built in to prevent damage due to abnormal conditions. Once the  $V_{DD}$  voltage is over the  $V_{DD}$  over-voltage protection voltage ( $V_{DD-OVP}$ ) and lasts for  $t_{D-OVP}$ , the PWM pulse is latched off. The PWM pulses stay latched off until the power supply is unplugged from the mains outlet.

## Functional Description (Continued)

### Limited Power Control

The FB voltage increases every time the output of the power supply is shorted or overloaded. If the FB voltage remains higher than a built-in threshold longer than  $t_{D-OLP}$ , PWM output is turned off. As PWM output is turned off, the supply voltage  $V_{DD}$  begins decreasing.

$$t_{D-OLP} \text{ (ms)} = 2.154 \times R_I \text{ (K}\Omega\text{)} \quad (2)$$

When  $V_{DD}$  goes below the turn-off threshold (eg. 10.5V), the controller is totally shut down.  $V_{DD}$  is charged up to the turn-on threshold voltage of 16.5V through the startup resistor until PWM output is restarted. This protection feature remains activated as long as the overloading condition persists. This prevents the power supply from overheating due to overloading conditions.

### Protection Latch Circuit

The built-in latch function provides a versatile protection feature that does not require external components (see *ordering information for a detailed description*). To reset the latch circuit, disconnect the AC line voltage of the power supply.

### Thermal Protection

An external NTC thermistor can be connected from the RT pin to ground. A fixed current,  $I_{RT}$ , is sourced from the RT pin. Because the impedance of the NTC decreases at high temperatures, when the voltage of the RT pin drops below 1.05V, PWM output is latched off. The RT pin output current is related to the PWM frequency programming resistor  $R_I$ .

### Noise Immunity

Noise from the current sense or the control signal may cause significant pulse width jitter, particularly in continuous-conduction mode. Slope compensation helps alleviate this problem. Good placement and layout practices should be followed. Avoid long PCB traces and component leads. Compensation and filter components should be located near the SG5842A/JA. Increasing the power-MOS gate resistance is advised.

### Reference Circuit

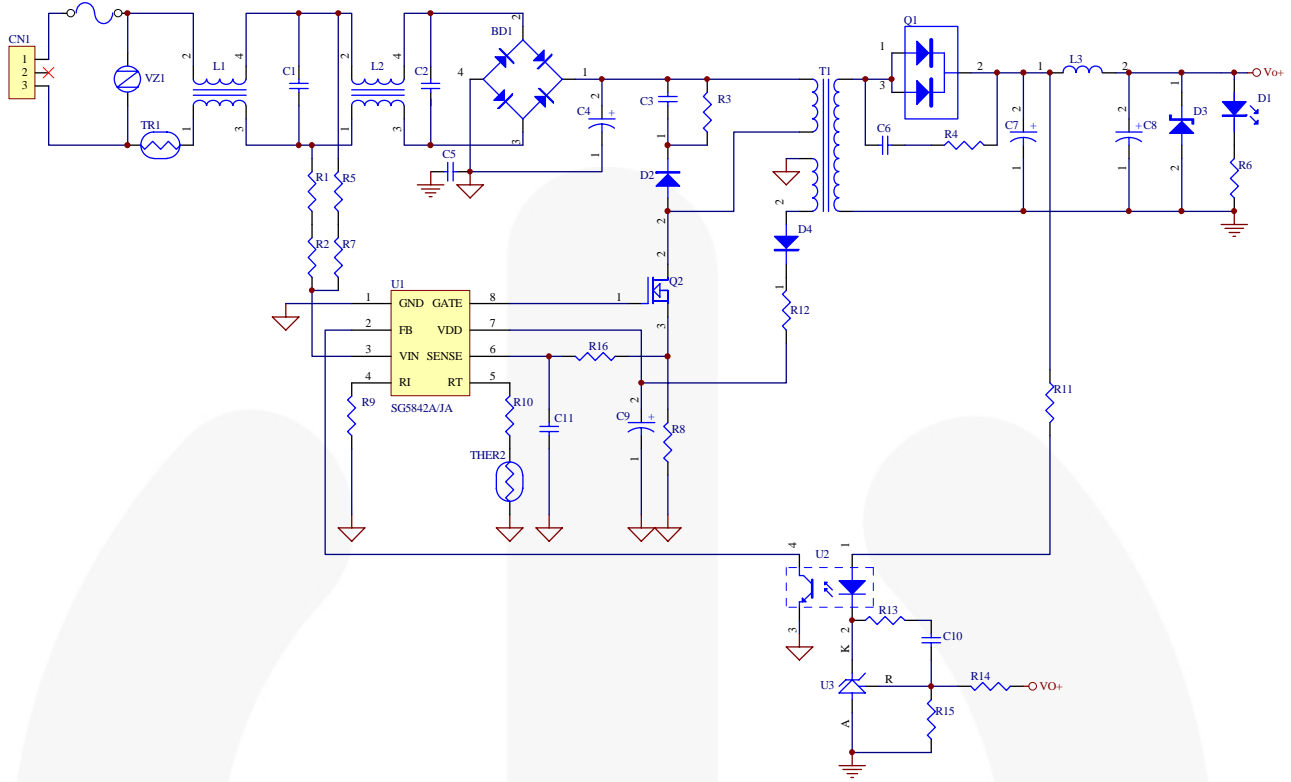
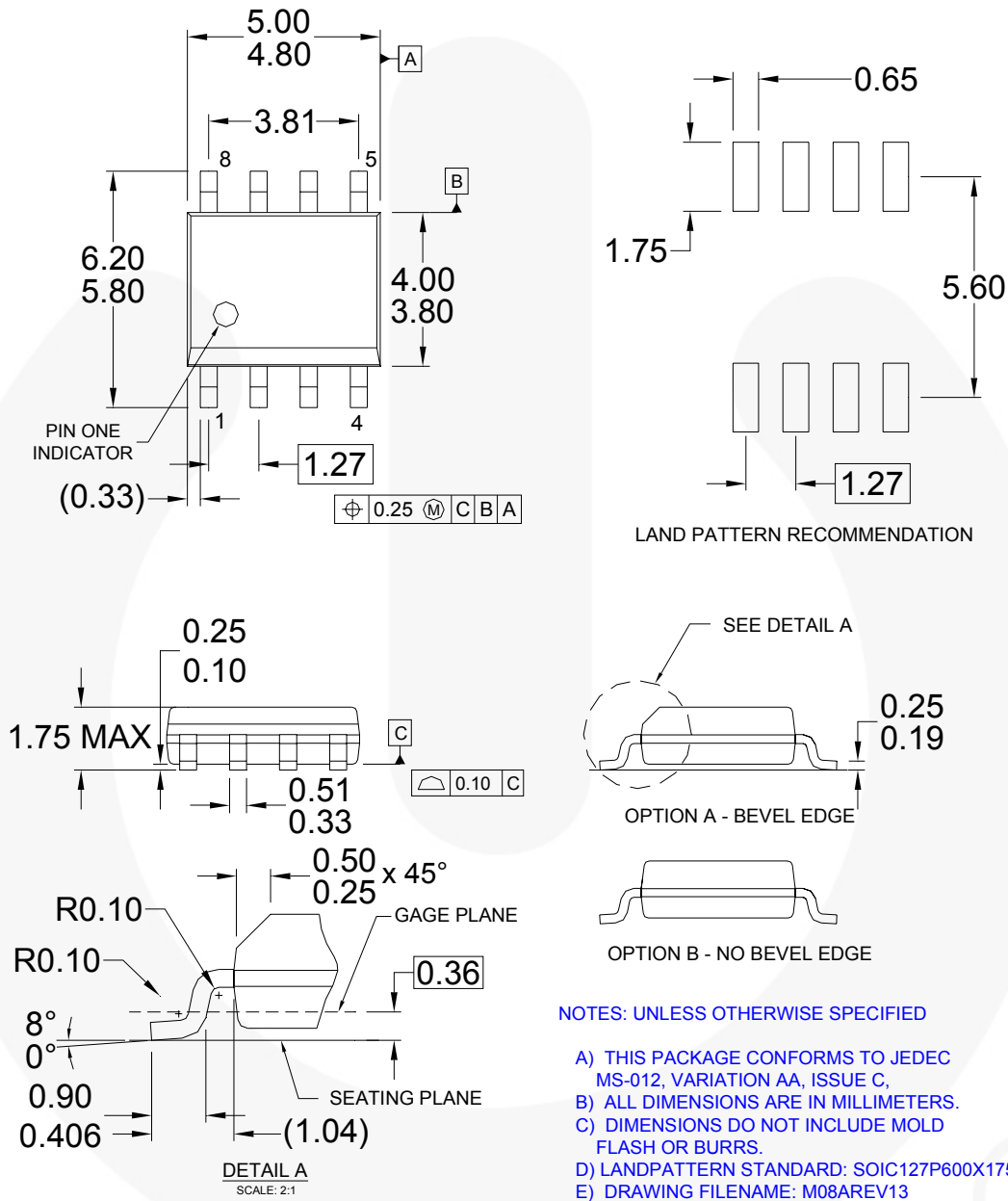


Figure 15. Reference Circuit

### BOM

Reference	Component	Reference	Component
BD1	BD 4A/600V	Q2	MOS 7A/600V
C1	XC 0.68 $\mu$ F/300V	R1, R2, R5, R7	R 470K $\Omega$ 1/4W
C2	XC 0.1 $\mu$ F/300V	R3	R 100K $\Omega$ 1/2W
C3	CC 0.01 $\mu$ F/500V	R4	R 47 $\Omega$ 1/4W
C4	EC 120 $\mu$ /400V	R6	R 2K $\Omega$ 1/8W
C5	YC 222p/250V	R8	R 0.3 $\Omega$ 2W
C6	CC 1000pF/100V	R9	R 33K $\Omega$ 1/8W
C7	EC 1000 $\mu$ F/25V	R10	R 4.7K $\Omega$ 1/8W
C8	EC 470 $\mu$ F/25V	R11	R 470 $\Omega$ 1/8W
C9	EC 10 $\mu$ F/50V	R12	R 0 $\Omega$ 1/8W
C10	CC 222pF/50V	R13	R 4.7K $\Omega$ 1/8W
C11	CC 470pF/50V	R14	R 154K $\Omega$ 1/8W 1%
D1	LED	R15	R 39K $\Omega$ 1/8W 1%
D2	Diode BYV95C	R16	R 100 $\Omega$ m 1/8W
D3	TVS P6KE16A	THER2	Thermistor TTC104
D4	Diode FR103	T1	Transformer (600 $\mu$ H-PQ2620)
F1	FUSE 4A/250V	U1	IC SG5842A/JA
L1	Choke (900 $\mu$ H)	U2	IC PC817
L2	Choke (10mH)	U3	IC TL431
L3	Inductor (2 $\mu$ H)	VZ1	VZ 9G
Q1	Diode 20A/100V		

## Physical Dimensions

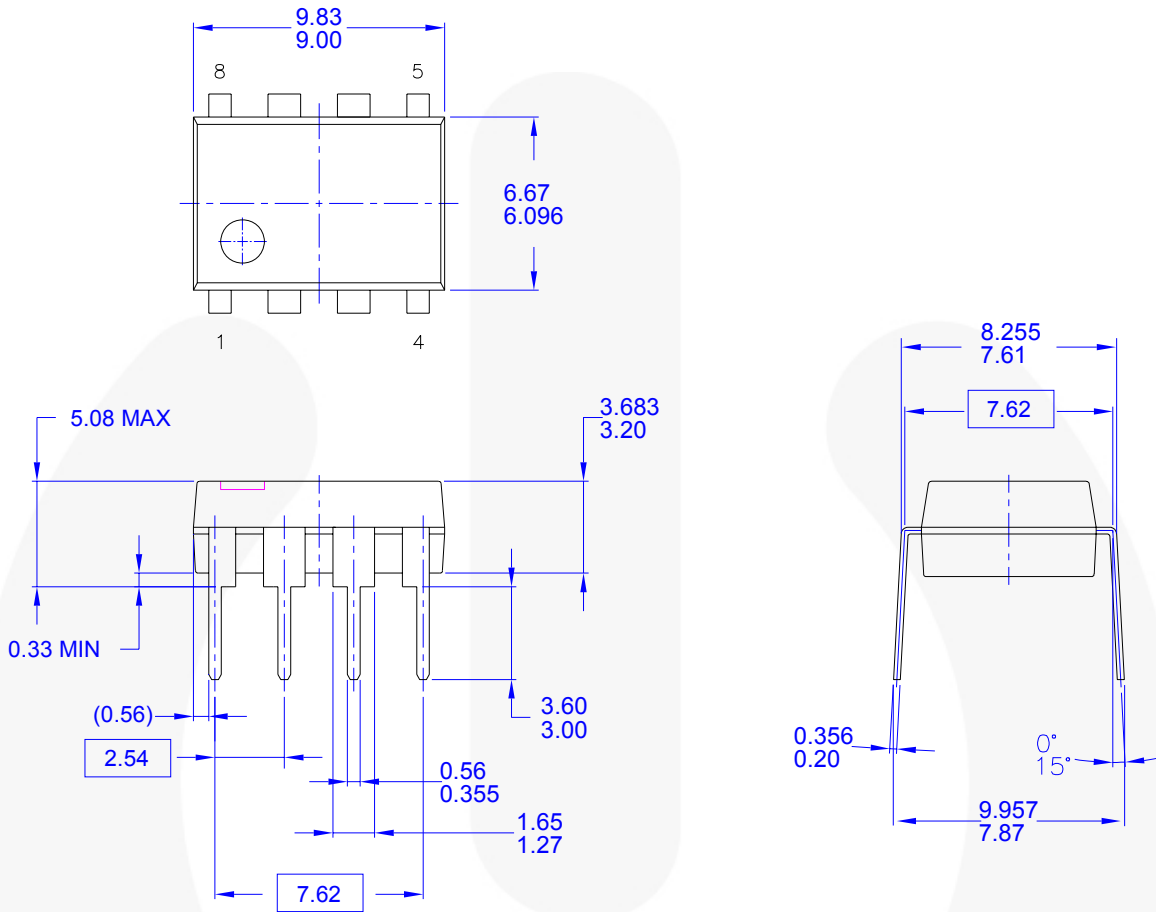


**Figure 16. 8-Pin, Small Outline Package (SOP)**

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:  
<http://www.fairchildsemi.com/packaging/>

**Physical Dimensions** (Continued)



**NOTES: UNLESS OTHERWISE SPECIFIED**

- A) THIS PACKAGE CONFORMS TO JEDEC MS-001 VARIATION BA
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- D) DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994
- E) DRAWING FILENAME AND REVISION: MKT-N08FRE2.

**Figure 17. 8-Pin, Dual Inline Package (DIP)**








Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:  
<http://www.fairchildsemi.com/packaging/>



**TRADEMARKS**

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- |   |   |   |   |
|---|---|---|---|
| AccuPower™  | FlashWriter®*   | Power-SPM™  |  SYSTEM GENERAL®*    |
| Auto-SPM™   | FPST™   | PowerTrench®  | The Power Franchise®  |
| Build it Now™   | F-PFST™   | PowerXS™  |  the power franchise |
| CorePLUS™   | FRFET®  | Programmable Active Droop™  | TinyBoost™  |
| CorePOWER™  | Global Power Resource™  | QFET®   | TinyBuck™   |
| CROSSVOLT™  | Green FPST™   | QS™   | TinyCalc™   |
| CTL™  | Green FPST™ e-Series™   | Quiet Series™   | TinyLogic®  |
| Current Transfer Logic™   | Gmax™   | RapidConfigure™   | TINYOPTO™   |
| DEUXPEED®   | GTOT™   |  ™ | TinyPower™  |
| EcoSPARK®   | IntelliMAX™   | Saving our world, 1mW/W/kW at a time™   | TinyPWM™  |
| EfficientMax™   | ISOPLANAR™  | SignalWise™   | TinyWire™   |
| EZSWITCH™**   | MegaBuck™   | SmartMax™   | TriFault Detect™  |
|  ™** | MICROCOUPLER™   | SMART START™  | TRUECURRENT™*   |
|  ™   | MicroFET™   | SPM®  | µSerDes™  |
| Fairchild®  | MicroPak™   | STEALTH™  |  SerDes®             |
| Fairchild Semiconductor®  | MillerDrive™  | SuperFET™   | UHC®  |
| FACT Quiet Series™  | MotionMax™  | SuperSOT™-3   | Ultra FRFET™  |
| FACT®   | Motion-SPM™   | SuperSOT™-6   | UniFET™   |
| FAST®   | OPTOLOGIC®  | SuperSOT™-8   | VCX™  |
| FastvCore™  | OPTOPLANAR®   | SupreMOS™   | VisualMax™  |
| FETBench™   |  ™ | SyncFET™  | XST™  |
|   | PDP SPM™  | Sync-Lock™  |   |

\* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

**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. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

**LIFE SUPPORT POLICY**

FAIRCHILD'S 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, and (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 a significant injury of the user.
2. A critical component in 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.

**ANTI-COUNTERFEITING POLICY**

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, [www.fairchildsemi.com](http://www.fairchildsemi.com), under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

**PRODUCT STATUS DEFINITIONS**

**Definition of Terms**

Datasheet Identification	Product Status	Definition
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.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. 144



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local  
Sales Representative