



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



SG6518

LCD Power Supply Supervisor

Features

- Two Adjustable Voltage Sense Input Pins: VSV1 and VSV2
- Over-voltage Protection (OVP) for 5V, 12V, and two outputs: V1, V2
- Over-current Protection (OCP) for 5V, 12V, and two outputs: V1, V2
- Adjustable Voltage Control Sense Input of V1 and V2 (ADJ-V1, ADJ-V2)
- Open-drain Output for FPO Pin
- 13ms PSON Control Delay
- No Lockup During the Fast AC Power-on/off
- Wide Supply Voltage Range: 4V to 15V
- Programmable Over-temperature Protection (OTP)

Description

SG6518 provides the over-voltage protection (OVP) for 5V, 12V, and outputs V1 and V2 as well as over-current protection (OCP) for 5V, 12V, and outputs V1 and V2. When the voltage of OTP pin decreases to 1.2V, the over-temperature protection (OTP) function is enabled. FPO is set to HIGH to turn off the PWM control IC. The voltage difference across the external current shunt is used for OCP functions. An external resistor can be used to adjust protection threshold.


The power supply is turned on after a 13ms delay time when the PSON signal is set from LOW to HIGH. To turn off the power supply, PSON signal is set from HIGH to LOW with the delay time 13ms.

Applications

- LCD Power Supply

Ordering Information

Part Number	Operating Temperature Range	Package	Packing Method
SG6518DZ	-40°C to +85°C	16-DIP	Rail
SG6518SZ	-40°C to +85°C	16-SOP	Reel & Tape

 All packages are lead free per JEDEC: J-STD-020B standard.

Application Diagram

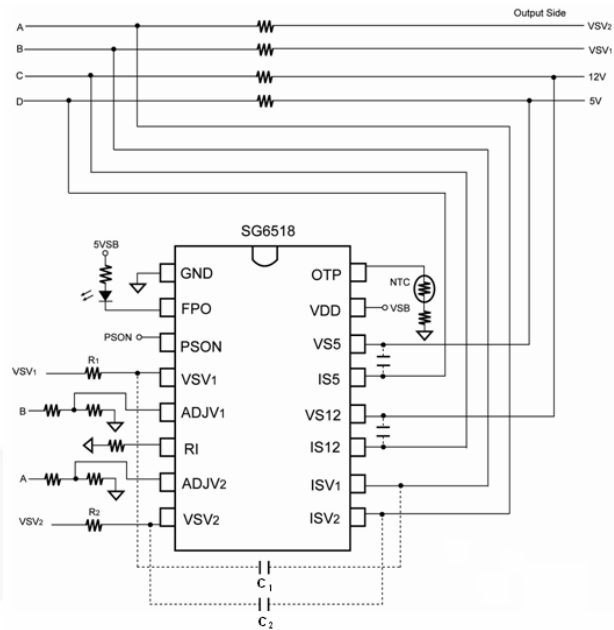


Figure 1. Typical Application

Note:

1. $R_1 = 200\Omega$ and $R_2 = 200\Omega$ are suggested.
2. C_1 and C_2 are suggested to be 100nF to 2.2uF.

Internal Block Diagram

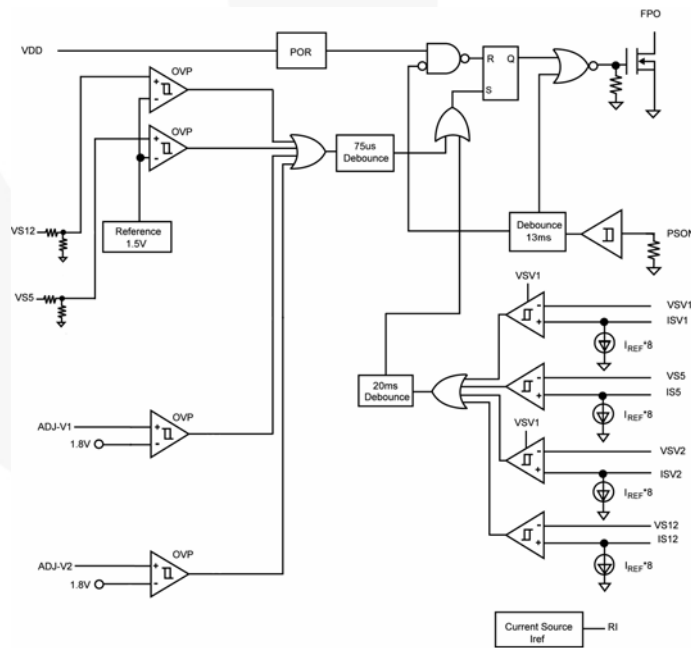


Figure 2. Function Block Diagram

Note:

3. The VSV1 pin is the power pin for the two OCP comparators.

Pin Configuration

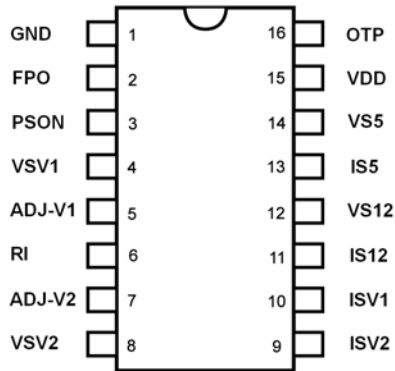


Figure 3. Pin Configuration

Pin Definitions

Pin #	Name	Description
1	GND	Ground.
2	FPO	Fault protection output. Output signal to control the primary PWM IC through an opto-coupler. When FPO is LOW, the PWM IC is enabled.
3	PSON	Remote on/off logic input from CPU or main-board. The power supply is turned on/off after 13ms delay.
4	VSV1	V1 voltage sense input. ⁽⁴⁾
5	ADJ-V1	V1 over-voltage control sense input.
6	RI	Reference setting. One external resistor, R_i , connected between the RI and GND pins determines a reference current, $I_{REF} = 1.5V/R_i$, for OCP programming.
7	ADJ-V2	V2 over-voltage control sense input.
8	VSV2	V2 voltage sense input.
9	ISV2	V2 over-current protection sense input. In typical applications, this pin is connected to the positive end of a current shunt through one resistor. When the voltage on ISV2 is higher than that of VSV2 by 6mV, OCP is enabled.
10	ISV1	VSV1 over-current protection sense input. In typical applications, this pin is connected to the positive end of a current shunt through one resistor. When the voltage on ISV1 is higher than that of VSV1 by 6mV, OCP is enabled.
11	IS12	12V over-current protection sense input. In typical applications, this pin is connected to the positive end of a current shunt through one resistor. When the voltage on IS12 is higher than that of VS12 by 6mV, OCP is enabled.
12	VS12	12V over-voltage control sense input.
13	IS5	5V over-current protection sense input. In typical applications, this pin is connected to the positive end of a current shunt through one resistor. When the voltage on IS5 is higher than that of VS5 by 6mV, OCP is enabled.
14	VS5	5V over-voltage control sense input.
15	VDD	Supply voltage, 4V ~ 15V. For general applications, it is connected to 5V-standby for supply voltage.
16	OTP	For over-temperature protection. An external NTC thermistor is connected from this pin to ground. The impedance of the NTC decreases at high temperatures. Once the voltage of the OTP pin drops below a fixed limit of 1.2V, FPO is open-drain output.

Note:

4. The VSV1 pin is the power pin for the two OCP comparators; it must be higher than VSV2.

Timing Diagram

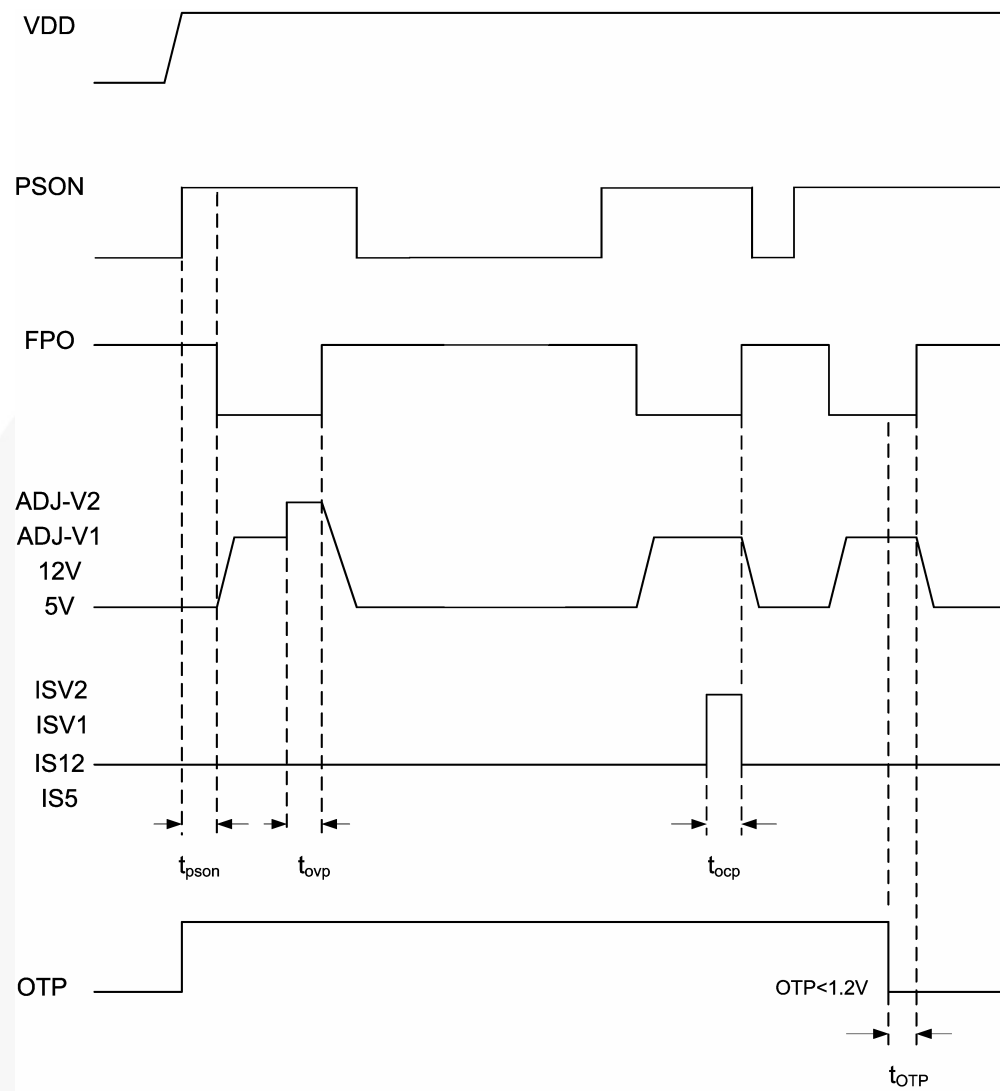


Figure 4. PSON On/Off and 5V, 12V, V1, V2, OVP, and OCP Functions



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. All voltage values, except differential voltages, are given with respect to GND pin. Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device.

Symbol	Parameter		Min.	Max.	Unit
V _{DD}	DC Supply Voltage			16	V
V _I	Input Voltage	ISV1, ISV2, VSV1, VSV2	-0.3	30.0	V
		PSON, IS12, VS12	-0.3	15.0	
		ADJ-V1, ADJ-V2, IS5, VS5, OTP, RI	-0.3	7.0	
V _{OUT}	Output Voltage	FPO	-0.3	15.0	V
P _D	Power Dissipation			400	mW
T _J	Operating Free Junction Temperature Range		-40	+125	°C
T _{STG}	Storage Temperature Range		-55	+150	°C
T _L	Lead Temperature (Wave Soldering, 10 Seconds)			+260	°C
ESD	Electrostatic Discharge Capability, Human Body Model			2.5	kV
	Electrostatic Discharge Capability, Machine Model			200	V

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
V _{DD}	DC Supply Voltage	4	15	V
T _A	Operating Ambient Temperature Range	-40	+85	°C

Electrical Characteristics

Unless otherwise noted, operating specifications are $V_{DD} = 5V$, $T_A = +25^\circ C$

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
VDD SECTION						
V_{DD}	DC Supply Voltage		4		15	V
I_{DD}	Supply Current			1.5		mA
t_R	Supply Voltage Rising Time		1			ms
V_{ST}	V_{DD} Start Threshold Voltage				4	V
Over-Voltage and Over-Current Protection (OVP, OCP)						
V_{OVP}	Over-Voltage Protection VS5		5.7	6.1	6.5	V
	Over-Voltage Protection VS12		13.2	13.8	14.4	
I_{REF}	Ratio of Current Sense Sink Current to Current Sense Setting Pin (RI) Source Current	$R_I = 23K\Omega \sim 120K\Omega$	7.6	8.0	8.4	
V_{OFFSET}	OCP Comparator Input Offset Voltage		-7		7	mV
$I_{LKG-FPO}$	Leakage Current (FPO)	FPO = 5V			5	μA
V_{OL-FPO}	Low Level Output Voltage (FPO)	$I_{SINK} 10mA$			0.5	V
t_{OVP}	OVP Delay Time		33	75	110	μs
t_{OCP}	OCP Delay Time		12.5	20.0	27.5	ms
V_{RI}	RI Pin Voltage		1.455	1.50	1.545	V
t_{ST-OCP}	Start-up OCP Protection Delay Time	FPO = LOW	158	200	242	ms
ADJ Section						
V_{ADJNOR}	Normal Voltage of ADJ-V1 & ADJ-V2		1.455	1.50	1.545	V
V_{ADJOVP}	Over-Voltage Protection of ADJ-V1 & ADJ-V2		1.455	1.80	1.545	V
PSON Control						
RPSON	Input Pull-low Resistor		50		100	$K\Omega$
V_{IH}	High-level Input Voltage		2			V
V_{IL}	Low-level Input Voltage				1	V
t_{PSON}	Timing PSON to On/Off	PSON HIGH to FPO LOW	6	13	20	ms
		PSON LOW to FPO HIGH	6	13	20	ms
Over-Temperature Protection (OTP)						
I_{OTP}	Ratio of OTP Source Current to Current Sense Setting Pin (RI) Source Current		5.82	6.00	6.18	
$V_{OTP-OFF}$	Threshold Voltage for OTP		1.164	1.200	1.236	V
t_{OTP}	Over-Temperature Debounce		225	325	425	μs

Typical Performance Characteristics

These characteristic graphs are normalized at $T_A = 25^\circ\text{C}$.

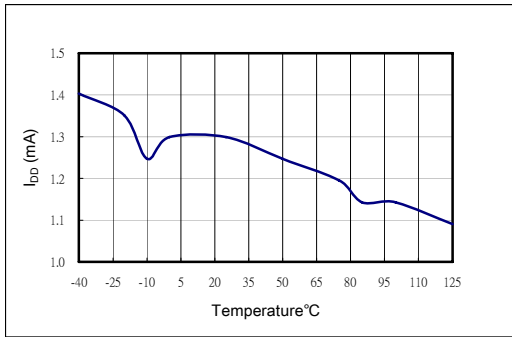


Figure 5. Supply Current

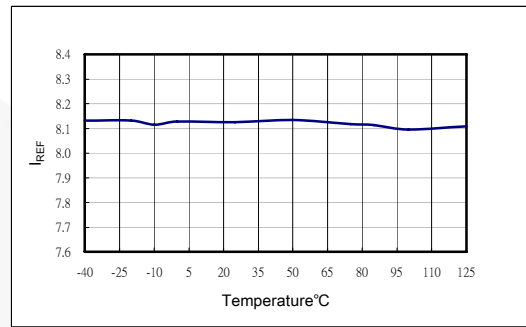


Figure 6. Ratio of Sense Sink Current Sense Setting Pin (RI) Source Current

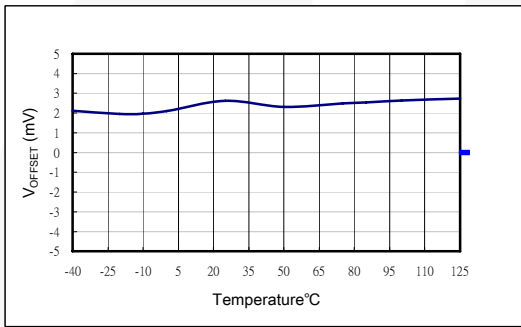


Figure 7. OCP Comparator Input Offset Voltage

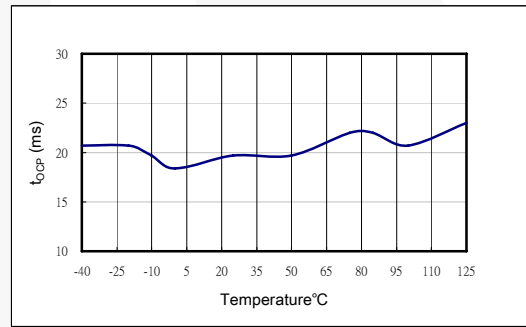


Figure 8. OCP Delay Time

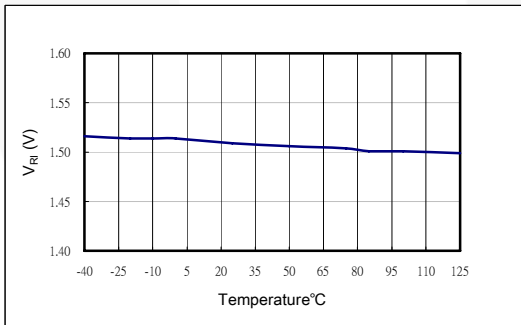


Figure 9. RI Pin Voltage

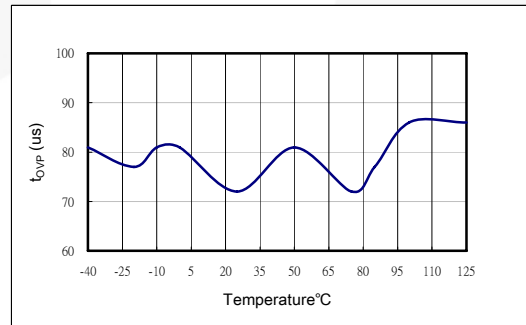


Figure 10. OVP Delay Time

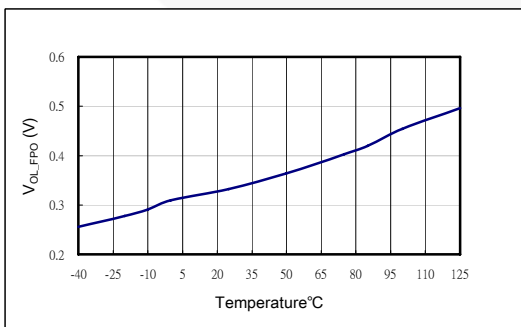


Figure 11. Low Level Output Voltage

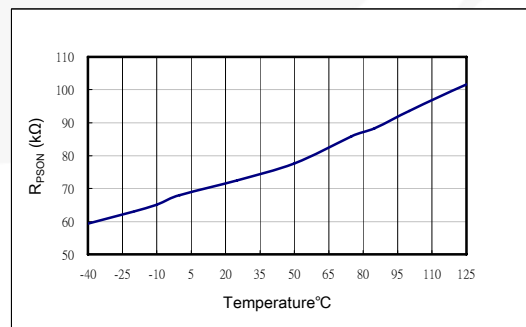


Figure 12. Input Pull-low Resistor

Applications Information (OCP)

The SG6518 provides over-current protection for the 5V, 12V, and two outputs: V1, V2. When an OCP condition occurs at any of the voltage rails, FPO opens. The internal OCP comparators have a very small offset voltage ($\pm 6mV$). The sink currents of IS5, IS12, ISV1, and ISV2 are eight times the current at the RI pin. The current at the RI pin is V_{RI}/R_i . Here is an example demonstrating how to set the over-current protection.

If $I_1 \cdot R_1 > (I_{RI} \cdot 8) \cdot R_2$, OCP is active.

To select R2 Resistor:

If $R_1 = 5m\Omega$, $R_i = 51k$, OCP Protection Level is 5A, then

$$R_2 = (I_1 \cdot R_1) / (I_{RI} \cdot 8)$$

$$= (5A \cdot 5m\Omega) / \{(1.5V / 51K) \cdot 8\}$$

$$= 106\Omega$$

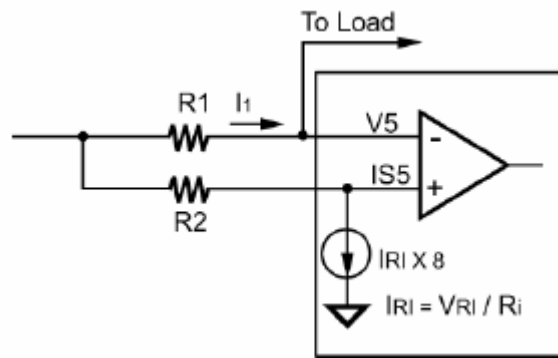


Figure 13. Over-Current Protection

Physical Dimensions

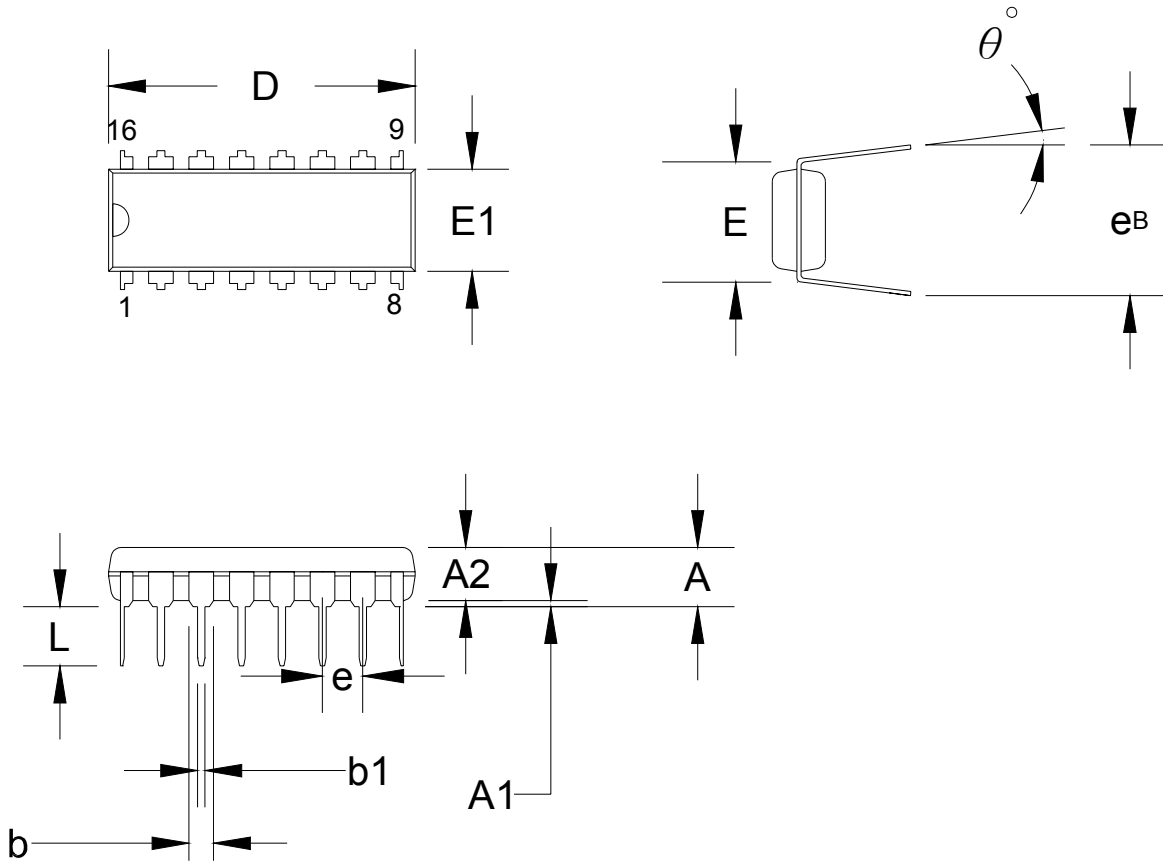


Figure 14. 16-Pin, Dual In-line Package (DIP)(D)

Dimensions

Symbol	Millimeter			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.334			0.210
A1	0.381			0.015		
A2	3.175	3.302	3.429	0.125	0.130	0.135
b		1.524			0.060	
b1		0.457			0.018	
D	18.669	19.177	19.685	0.735	0.755	0.775
E		7.620			0.300	
E1	6.121	6.299	6.477	0.241	0.248	0.255
e		2.540			0.100	
L	2.921	3.302	3.810	0.115	0.130	0.150
e _B	8.509	9.017	9.525	0.335	0.355	0.375
θ°	0°	7°	15°	0°	7°	15°

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)

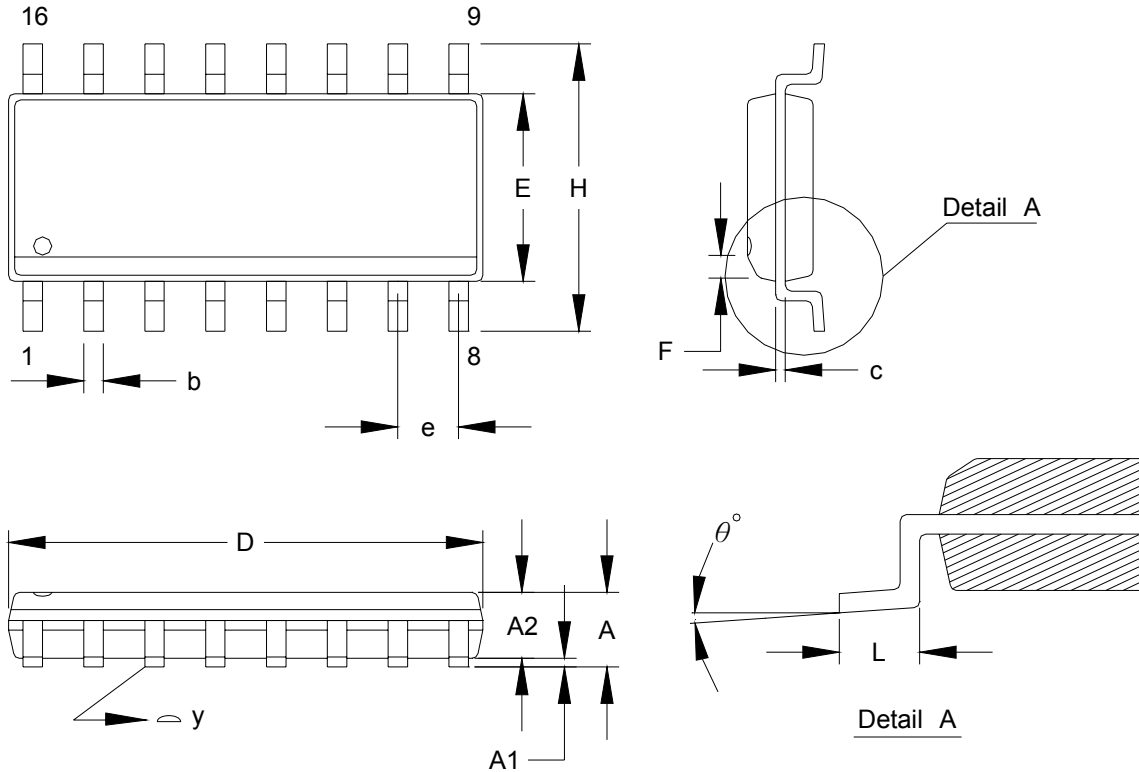


Figure 15. 16-Pin, Small-Outline Package (SOP)(S)

Dimensions

Symbol	Millimeter			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.346		1.753	0.053		0.069
A1	0.101		0.254	0.004		0.010
A2	1.244		1.499	0.049		0.059
b		0.406			0.016	
c		0.203			0.008	
D	9.804		10.008	0.386		0.394
E	3.810		3.988	0.150		0.157
e		1.270			0.050	
H	5.791		6.198	0.228		0.244
L	0.406		1.270	0.016		0.050
F		0.381X45°			0.015X45°	
y			0.101			0.004
θ°	0°		8°	0°		8°

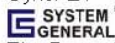



Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications 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.

ACEx [®]	FPST [™]	PDP-SPM [™]	SyncFET [™]
Build it Now [™]	FRFET [®]	Power220 [®]	 SYSTEM [®]
CorePLUS [™]	Global Power Resource SM	Power247 [®]	GENERAL [®]
CROSSVOLT [™]	Green FPS [™]	POWEREDGE [®]	The Power Franchise [®]
CTL [™]	Green FPS [™] e-Series [™]	Power-SPM [™]	 the power franchise
Current Transfer Logic [™]	GTO [™]	PowerTrench [®]	TinyBoost [™]
EcoSPARK [®]	<i>i-Lo</i> [™]	Programmable Active Droop [™]	TinyBuck [™]
EZSWITCH [™] *	IntelliMAX [™]	QFET [®]	TinyLogic [®]
 [™]	ISOPLANAR [™]	QS [™]	TINYOPTO [™]
 [®]	MegaBuck [™]	QT Optoelectronics [™]	TinyPower [™]
Fairchild [®]	MICROCOUPLER [™]	Quiet Series [™]	TinyPWM [™]
Fairchild Semiconductor [®]	MicroFET [™]	RapidConfigure [™]	TinyWire [™]
FACT Quiet Series [™]	MicroPak [™]	SMART START [™]	μSerDes [™]
FACT [®]	MillerDrive [™]	SPM [®]	UHC [®]
FAST [®]	Motion-SPM [™]	STEALTH [™]	Ultra FRFET [™]
FastvCore [™]	OPTOLOGIC [®]	SuperFET [™]	UniFET [™]
FlashWriter [®] *	OPTOPLANAR [®]	SuperSOT [™] 3	VXC [™]
		SuperSOT [™] 6	
		SuperSOT [™] 8	

* EZSWITCH[™] and FlashWriter[®] are 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.

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; 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	This 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	This datasheet contains specifications on a product that has been discontinued by Fairchild Semiconductor. The datasheet is printed for reference information only.

Rev. I32