

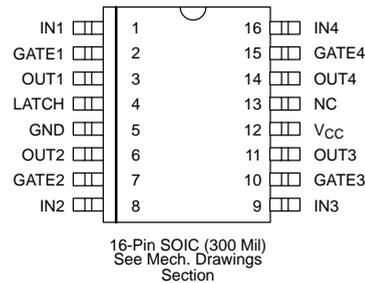
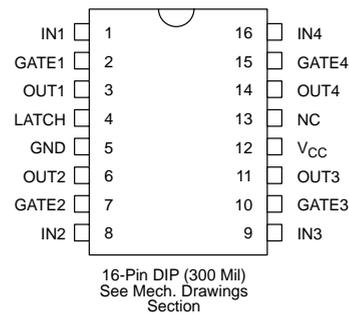
**DALLAS**  
SEMICONDUCTOR

## DS1640/DS1640C Personal Computer Power FET

### FEATURES

- Contains four P channel power FET switches that can each supply over 300 mA @ 0.2 volts drop
- Controlled directly from CMOS or TTL level signals
- Fast switching time of less than 10  $\mu$ s at rated supply current
- 16-pin DIP or 16-pin SOIC surface mount package
- Positive logic signal turns each FET on and ground or low level signal turns each FET off
- Off condition allows less than 50 nA of current flow
- Low control gate capacitance of less than 5 pF
- FET gates can either follow inputs or be latched
- Designed for use with power supplies ranging from +3 to +5 volts

### PIN ASSIGNMENT



### PIN DESCRIPTION

V <sub>CC</sub>	-	+3 to +5 Volt Input
GND	-	Ground
IN1-IN4	-	FET Sources
OUT1-OUT4	-	FET Drains
GATE1-GATE4	-	FET Control Gates
NC	-	No Connection
LATCH	-	Gate Inputs Latch Control

### DESCRIPTION

The DS1640 contains four P channel power MOS FET's designed as switches to conserve power in personal computer systems. When connected to power management control units, power consuming devices like disk drives or display panel backlights can be routinely shut down to conserve battery or main power supply en-

ergy. The P channel power MOS FET's are individually controlled and are capable of handling 300 mA each continuously with less than 0.2 volts drop from input to output. The device requires a +3  $\hat{U}$  +5 volt power supply input which is used to power internal logic and to operate a gate bias generator.



**ABSOLUTE MAXIMUM RATINGS\***

Voltage on Any Pin Relative to Ground	-0.3V to +7.0V
Operating Temperature	0°C to 70°C
Storage Temperature	-55°C to +125°C
Soldering Temperature	260°C for 10 seconds

\* This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

**DC OPERATING CONDITIONS**

(0°C to 70°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	$V_{CC}$	3.0		5.5	V	1, 2
Logic 0 Input $3.0\text{ V} \leq V_{CC} \leq 4.5\text{ V}$	$V_{IL2}$	-0.3		+0.5	V	
Logic 0 Input $4.5\text{ V} \leq V_{CC} \leq 5.0\text{ V}$	$V_{IL1}$	-0.3		+0.8	V	1
Logic 1 Input $3.0\text{ V} \leq V_{CC} \leq 5.0\text{ V}$	$V_{IH}$	2.0		$V_{CC}+0.5$	V	1, 7
Source Voltage	$V_{SOURCE}$			$V_{CC}+0.5$	V	1, 7

**DC ELECTRICAL CHARACTERISTICS**(0°C to 70°C;  $V_{CC} = +5V \pm 10\%$ )

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Current	$I_{CC1}$		0.3	1	mA	3
Supply Current	$I_{CC2}$		0.1	1	$\mu\text{A}$	4
Switch Off Leakage	$I_{SL}$			100	nA	
Switch On Resistance	$R_{ON}$		0.3	.67	$\Omega$	
Switch Current @ $V_F = 200\text{ mV}$	$I_S$			300	mA	5
Input Leakage	$I_{IL}$	-1		+1	$\mu\text{A}$	6
Gate Input Capacitance	$C_G$			5	pF	7

**AC ELECTRICAL CHARACTERISTICS**(0°C to 70°C;  $V_{CC} = +5V \pm 10\%$ )

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Switching Time (OFF → ON)	$t_{STON}$			10	$\mu\text{s}$	
Switching Time (ON → OFF)	$t_{STOFF}$			10	$\mu\text{s}$	
Minimum Time to Engage Latch	$t_{LM}$			50	ns	

**NOTES:**

1. All voltages are referenced to ground.
2. When  $V_{CC}$  is below minimum limits output levels are not guaranteed.
3.  $I_{CC1}$  is the supply current with one or more switches on.
4.  $I_{CC2}$  is when all switches are off and all inputs are within 0.5V of a supply rail.
5. Each switch is capable of carrying 300 mA maximum at 200 mV forward drop.
6. Input leakage applies to the four gate inputs and the latch input only.
7. Applies to each of four gate inputs and the latch input.

Dallas Semiconductor devices are built to the highest quality standards and manufactured for long term reliability. All DS1640 devices are made using the same quality materials and manufacturing methods. However, consumer versions of the DS1640 are not exposed to environmental stresses that some commercial device manufacturing flows require. Devices that are designated as consumer product have a "C" designator in the product number. For example, the DS1640C is a consumer grade product.

