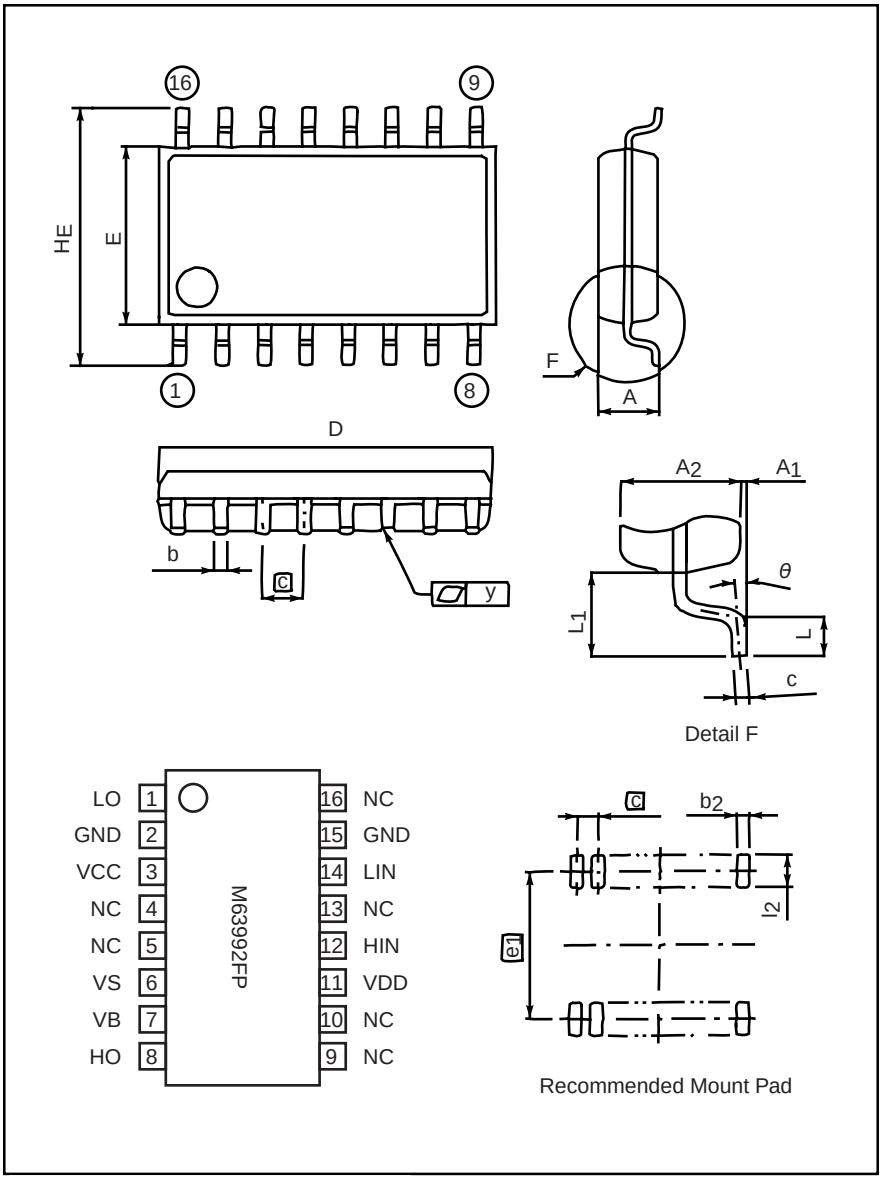
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

HVIC
Half-Bridge Driver



Outline Drawing and Pin Diagram

Description:
M63992FP is a high voltage, Power MOSFET/IGBT module driver for half-bridge applications.

Features:
- ☐ 600V Floating Supply Voltage
- ☐ ±2A Output Current
- ☐ Half-Bridge Driver
- ☐ SOP-16 Package

Application:
- ☐ Appliances
- ☐ Air Conditioners
- ☐ AC Servo Motors
- ☐ General Purpose Power Supplies

Dimensions	Inches	Millimeters
A	0.08 Max.	2.1 Max.
A_1	0.004±0.004/0	0.1±0.1/0
A_2	0.07	1.8
b	0.02+0.004/-0.002	0.4+0.1/-0.05
c	0.01+0.002/-0.008	0.2+0.05/-0.02
[c]	0.05	1.27
D	0.4±0.004	10.1±0.1
E	0.21±0.004	5.3±0.1

Dimensions	Inches	Millimeters
H_E	0.31±0.01	7.8±0.3
L	0.02±0.01	0.6±0.2
L_1	0.05	1.25
[e1]	0.31	7.62
y	0.004 Max.	0.1 Max.
θ	0° – 8°	0° – 8°
b_2	0.03	0.76
l_2	0.05 Min.	1.27 Min.

Absolute Maximum Ratings, T_a = 25°C unless otherwise specified

Ratings	Symbol	Test Conditions	M63992FP	Units
High Side Floating Supply Voltage	V_B		-0.5 ~ 624	Volts
High Side Floating Supply Offset Voltage	V_S		V_B-24/+0.5	Volts
High Side Output Voltage	V_{HO}		V_S-0.5 ~ V_B+0.5	Volts
Low Side Fixed Supply Voltage	V_{CC}		-0.5 ~ 24	Volts
Low Side Output Voltage	V_{LO}		-0.5 ~ V_{CC}+0.5	Volts
Logic Supply Voltage	V_{DD}		-0.5 ~ 7	Volts
Logic Input Voltage	V_{IN}	H_{IN}, L_{IN}	-0.5 ~ V_{DD}+0.5	Volts
Allowable Offset Supply Voltage Transient	d_{VS}/dt		±50	V/ns
Package Power Dissipation	P_t	T_a = 25°C, On Board	1.1	W
Linear Derating Factor	Kθ	T_a > 25°C, On Board	-11	mW/°C
Junction Temperature	T_j		-20 ~ 125	°C
Operation Temperature	T_{opr}		-20 ~ 75	°C
Storage Temperature	T_{stg}		-40 ~ 125	°C

Recommended Operating Conditions

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
High Side Floating Supply Voltage	V_B		V_S+13.5	—	V_S+20	Volts
High Side Floating Supply Offset Voltage	V_S		-5	—	500	Volts
Low Side Fixed Supply Voltage	V_{CC}		13.5	—	20	Volts
Logic Supply Voltage	V_{DD}		4.5	—	5.5	Volts
Logic Input Voltage	V_{IN}	H_{IN}, L_{IN}	0	—	V_{DD}	Volts

Function Table

H_{IN}	L_{IN}	V_{BS} U_V	V_{CC} U_V	HO	LO	Behavioral State
L	L	H	H	L	L	LO = OFF, HO = OFF
L	H	H	H	L	H	LO = ON, HO = OFF
H	L	H	H	H	L	LO = OFF, HO = ON
H	H	H	H	L	L	LO = OFF, HO = OFF, L_{IN} = H_{IN} = H Simultaneously
X	L	L	H	L	L	LO = OFF, HO = OFF, V_{BS} U_V Tripped
X	H	L	H	L	H	LO = ON, HO = OFF, V_{BS} U_V Tripped
L	X	H	L	L*	L	LO = OFF, HO = OFF, V_{CC} U_V Tripped
H	X	H	L	H*	L	LO = OFF, HO = ON, V_{CC} U_V Tripped

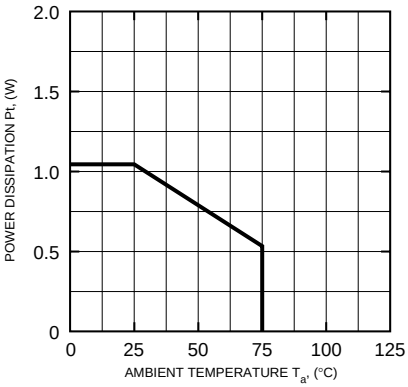
* Note: "L" state of V_{BS} U_V and V_{CC} U_V means that supply is below trip level.
If V_{CC} becomes less than U_V trip, HO state will not change.
If V_{CC} becomes less than U_V, H_{IN} state will not transfer to HO.

Electrical Characteristics, T_a = 25°C, V_{CC} = V_{BS} = 15V, V_{DD} = 5V unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.*	Max.	Units
Floating Supply Leakage Current	I_{FS}	V_B = V_S = 600V	—	—	10	µA
V_{BS} Standby Current	I_{BS}		0.2	0.5	1.0	mA
V_{CC} Standby Current	I_{CC}		0.2	0.5	1.0	mA
V_{DD} Standby Current	I_{DD}		—	—	100	µA
High Level Output Voltage	V_{OH}	I_O = 0A, LO, HO	13.8	14.4	—	Volts
Low Level Output Voltage	V_{OL}	I_O = 0A, LO, HO	—	—	0.1	Volts
High Level Input Threshold Voltage	V_{IH}	H_{IN}, L_{IN}	2.1	3.0	4.0	Volts
Low Level Input Threshold Voltage	V_{IL}	H_{IN}, L_{IN}	0.6	1.5	1.9	Volts
High Level Input Bias Current	I_{IH}	V_{IN} = 5V	—	25	75	µA
Low Level Input Bias Current	I_{IL}	V_{IN} = 0V	—	—	1.0	µA
V_{BS} Supply UV Trip Voltage	V_{BSUVT}		9.5	10.5	11.5	Volts
V_{BS} Supply UV Reset Voltage	V_{BSUVR}		10.0	11.0	12.0	Volts
VBS Supply Filter Time	t_{VBSUV}		—	7.5	—	µs
VCC Supply UV Trip Voltage	V_{CCUVT}		9.5	10.5	11.5	Volts
VCC Supply UVReset Voltage	V_{CCUVR}		10.0	11.0	12.0	Volts
VCC Supply Filter Time	t_{VCCUV}		—	7.5	—	µs
Output High Level Short Circuit Pulsed Current	I_{OH}	V_O = 0V, V_{IN} = 5V, PW<10 µs	—	-2.5	—	A
Output Low Level Short Circuit Pulsed Current	I_{OL}	V_O = 15V, V_{IN} = 0V, PW<10 µs	—	2.5	—	A
Output High Level On Resistance	R_{OH}	I_O = -200mA, R_{OH} = (V_{OH} – V_O) /I_O	—	10	13	Ω
Output Low Level On Resistance	R_{OL}	I_O = 200mA, R_{OL} = V_O/I_O	—	2.5	3.0	Ω
High SideTurn-On Propagation Delay	t_{dLH} (HO)	CL = 1000pF between HO to V_S	250	300	350	ns
High Side Turn-Off Propagation Delay	t_{dHL}(HO)		230	280	330	ns
High Side Turn-On Rise Time	t_r (HO)		—	20	30	ns
High Side Turn-Off Fall Time	t_f (HO)		—	15	25	ns
Low SideTurn-On Propagation Delay	t_{dLH} (LO)	CL = 1000pF between LO to GND	250	300	350	ns
Low Side Turn-Off Propagation Delay	t_{dHL}(LO)		230	280	330	ns
Low Side Turn-On Rise Time	t_r (LO)		—	20	30	ns
Low Side Turn-Off Fall Time	t_f (LO)		—	15	25	ns
Delay Matching, High Side and Low Side Turn-On	t_{dMon}	I_{tdLH} (HO) – t_{dLH} (LO) I	—	—	30	ns
Delay Matching, High Side and Low Side Turn-Off	t_{dMoff}	I_{tdHL} (HO) – t_{dHL} (LO) I	—	—	30	ns

* The typical values are those measured under ambient temperature (T_a) of 25°C.

THERMAL DERATING FACTOR CHARACTERISTICS (TYPICAL)



BLOCK DIAGRAM