M63975FP

IGBT MOSFET DRIVER

DESCRIPTION

M63975FP is Power MOSFET and IGBT module driver for half bridge applications.

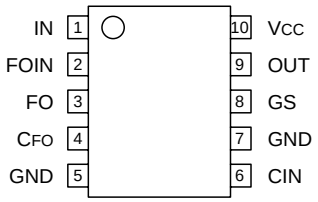
FEATURES

- SUPPLY VOLTAGE 24V
- OUTPUT CURRENT ..... ±600mA
- LOW SIDE DRIVER
- SOP-10
- BUILT-IN SOFT STOP FACILITY

APPLICATION

MOSFET and IGBT module inverter driver

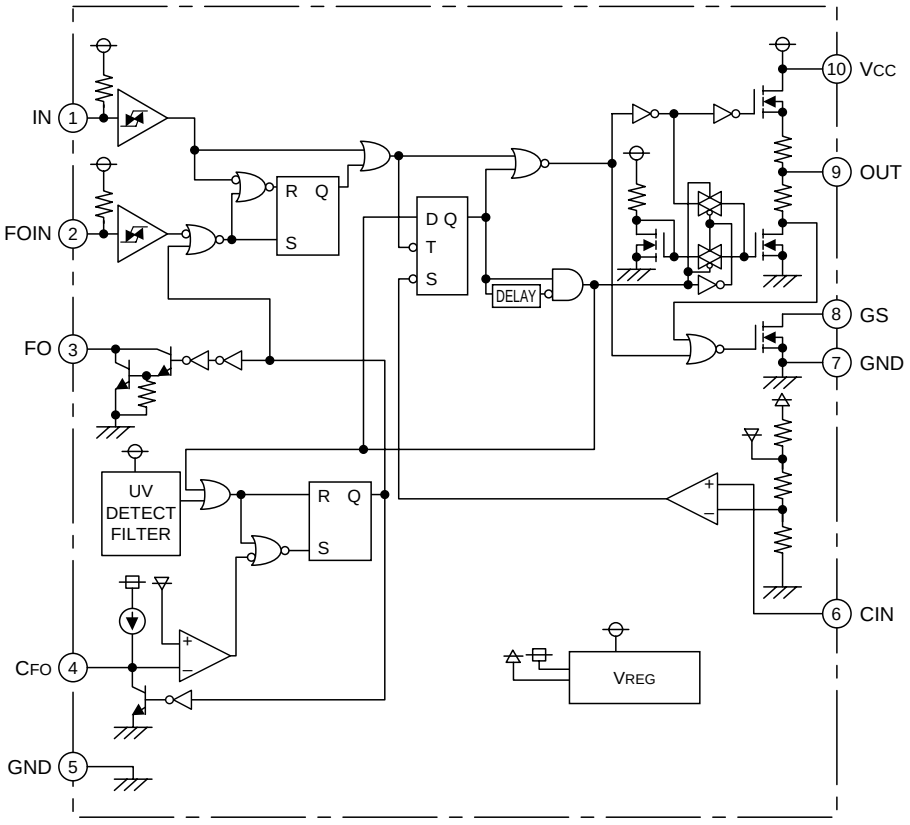
PIN CONFIGURATION (TOP VIEW)



NC:NO INTERNAL CONNECTION

Outline 10P2N

BLOCK DIAGRAM



MITSUBISHI ELECTRIC

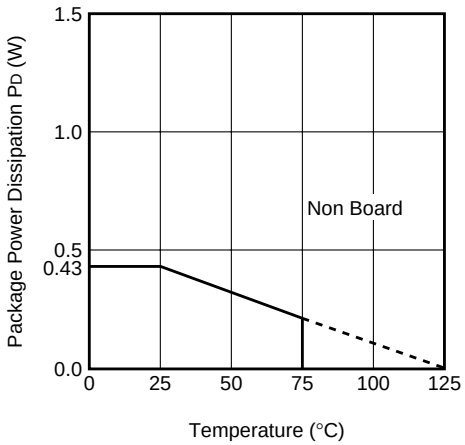
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Fixed Supply Voltage		–0.5 ~ 24	V
V_{OUT}	Output Voltage 1		–0.5 ~ V_{CC}+0.5	V
I_{OUT}	Output Current 1		±600	mA
V_{GS}	Output Voltage 2		–0.5 ~ V_{CC}+0.5	V
I_{GS}	Output Current 2		375	mA
V_{IN}	Input Voltage		–0.5 ~ V_{CC}+0.5	V
V_{FIN}	FOIN Input Voltage		–0.5 ~ V_{CC}+0.5	V
V_{CIN}	CIN Input Voltage		–0.5 ~ V_{CC}+0.5	V
V_{FO}	FO Output Voltage		–0.5 ~ V_{CC}+0.5	V
I_{FO}	FO Output Current		15	mA
P_D	Package Power Dissipation	Ta = 25°C, Non Board	0.43	W
K θ	Linear Derating Factor	Ta > 25°C, Non Board	–4.31	mW/°C
Tj	Junction Temperature		–20 ~ 125	°C
Topr	Operation Temperature		–20 ~ 75	°C
Tstg	Storage Temperature		–40 ~ 125	°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V_{CC}	Fixed Supply Voltage		13.5	—	16.5	V
V_{IN}	Input Voltage		0	—	5	V

THERMAL DERATING FACTOR CHARACTERISTIC



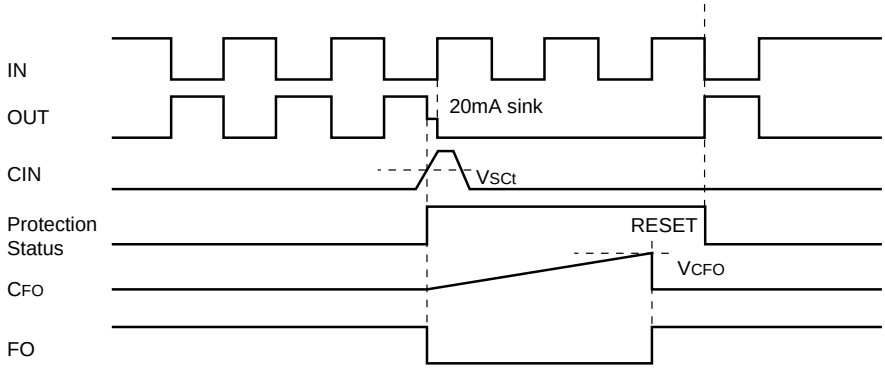
ELECTRICAL CHARACTERISTICS (Ta=25°C, V_{CC}=15V, GND=0V unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.*	Max.	
I_{CC}	V_{CC} Standby Current	V_{IN}=V_{CC}	1.0	2.0	3.5	mA
V_{IH}	High Level Input Threshold Voltage	V_{IL}: Low Level Input Threshold Voltage	2.5	3.0	4.0	V
V_{INh}	Input Hysteresis Voltage	V_{INh}=V_{IH}–V_{IL}	0.5	1.6	3.2	V
I_{IH}	High Level Input Bias Current	V_{IN}=V_{CC}	–0.1	—	—	µA
I_{IL}	Low Level Input Bias Current	V_{IN}=0V	50	100	200	µA
V_{CCuvr}	V_{CC} Supply UV Reset Voltage	V_{CCuvt}: V_{CC} Supply UV Trip Voltage	11.2	12.0	12.8	V
V_{CCuvh}	V_{CC} Supply UV Hysteresis Voltage	V_{CCuvh}=V_{CCuvr}–V_{CCuvt}	—	0.5	—	V
t_{VCCuv}	V_{CC} Supply UV Filter Time		—	10.0	—	µs
V_{FIH}	FOIN High Level Input Threshold Voltage	V_{FIL}: Low Level Input Threshold Voltage	2.5	3.0	4.0	V
V_{FIh}	FOIN Input Hysteresis Voltage	V_{FIh}=V_{FIH}–V_{FIL}	0.5	1.6	3.2	V
I_{FIH}	FOIN High Level Input Bias Current	V_{FIN}=V_{CC}	–0.1	—	—	µA
I_{FIL}	FOIN Low Level Input Bias Current	V_{FIN}=0V	50	100	200	µA
V_{CIN}	CIN Input Threshold Voltage		0.40	0.50	0.60	V
t_{CIN}	CIN Propagation Delay		—	0.5	0.8	µs
V_{CFH}	C_{FO} Threshold Voltage		2.6	3.0	3.4	V
I_{CFO}	C_{FO} Source Current	V_{CFO}=0V	–40.0	–25.0	–15.0	µA
I_{FO}	FO Leak Current	V_{FO}=V_{CC}	—	—	1.0	µA
V_{FO}	FO Output Saturation Voltage	I_{FO}=15mA	0.7	1.2	2.0	V
V_{OH}	High Level Output Voltage	I_O=0mA	13.3	14.0	—	V
V_{OL}	Low Level Output Voltage	I_O=0mA	—	—	0.1	V
R_{OH}	Output High Level On Resistance	I_O=–200mA, R_{OH}=(V_{OH}–V_O)/I_O	26.3	35.7	71.4	Ω
R_{OL}	Output Low Level On Resistance	I_O=200mA, R_{OH}=V_O/I_O	13.0	19.0	28	Ω
t_{dLH}	Turn-On Propagation Delay	OUT–GND	—	300	900	ns
t_{dHL}	Turn-Off Propagation Delay	OUT–GND	—	300	900	ns
V_{Oth}	GSOUT Threshold Voltage		1.5	2.5	3.8	V
V_{GS}	GS Output Saturation Voltage	I_{GS}=100mA	0.7	1.6	2.5	V
I_{SO}	OUT Soft Cut-Off Sink Current	V_{CIN}=1V, V_O=V_{CC}	—	20	—	mA
t_{SO}	OUT Soft Cut-Off Delay		2.0	5.5	9.0	µs

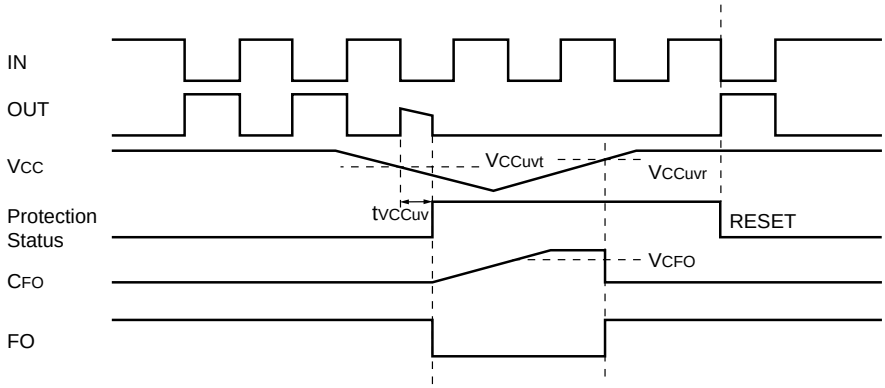
* Typ. is not specified.

TIMING DIAGRAM

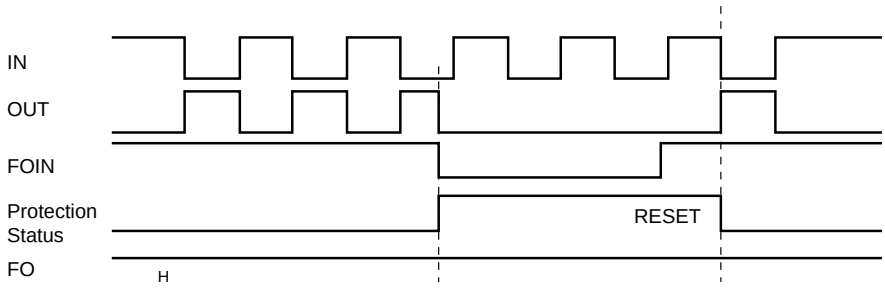
1. SC



2. UV



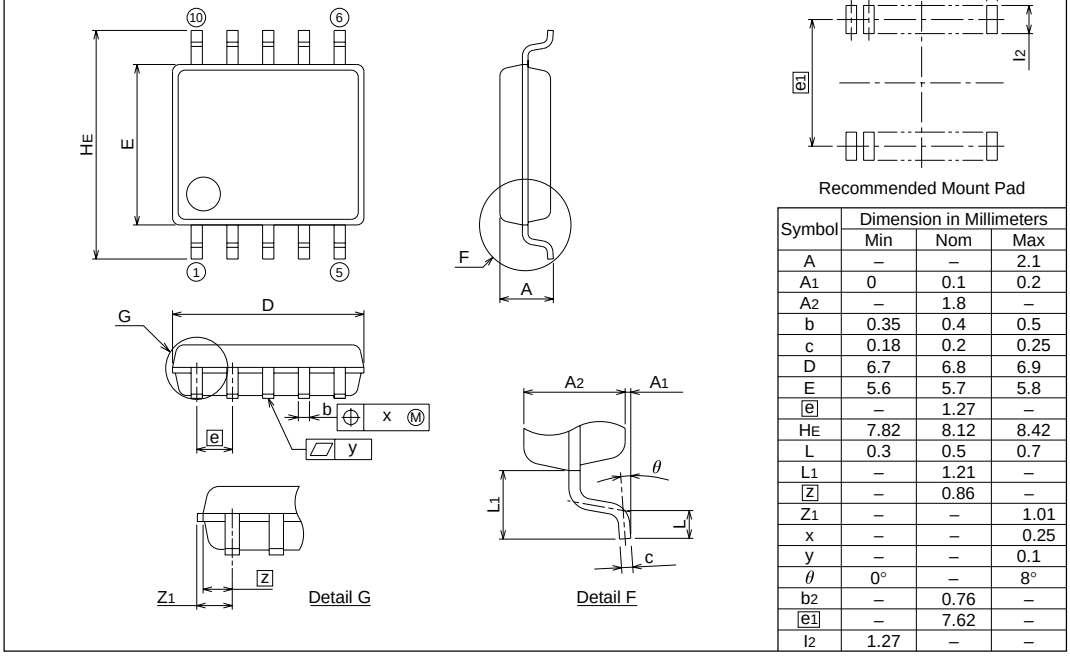
3. FOIN



PACKAGE OUTLINE

10P2N-A — **Plastic 10pin 300mil SOP**

EIAJ Package Code	JEDEC Code	Weight(g)	Lead Material
SOP010-P-300-1.27	–	0.16	Cu Alloy



Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	–	–	2.1
A1	0	0.1	0.2
A2	–	1.8	–
b	0.35	0.4	0.5
c	0.18	0.2	0.25
D	6.7	6.8	6.9
E	5.6	5.7	5.8
e	–	1.27	–
HE	7.82	8.12	8.42
L	0.3	0.5	0.7
L1	–	1.21	–
Z	–	0.86	–
Z1	–	–	1.01
x	–	–	0.25
y	–	–	0.1
θ	0°	–	8°
b2	–	0.76	–
e1	–	7.62	–
l2	1.27	–	–