

M81725FP

HIGH VOLTAGE HIGH SIDE DRIVER

DESCRIPTION

M81725FP is high voltage Power MOSFET and IGBT driver for high side applications.

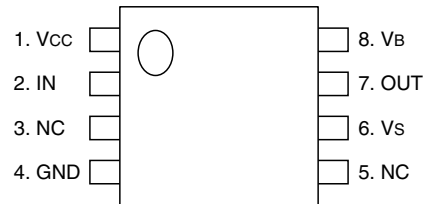
FEATURES

- FLOATING SUPPLY VOLTAGE 600V
- OUTPUT CURRENT $\pm 3A$ (typ)
- UNDERVOLTAGE LOCKOUT
- INPUT FILTER
- SOP-8 PACKAGE

APPLICATIONS

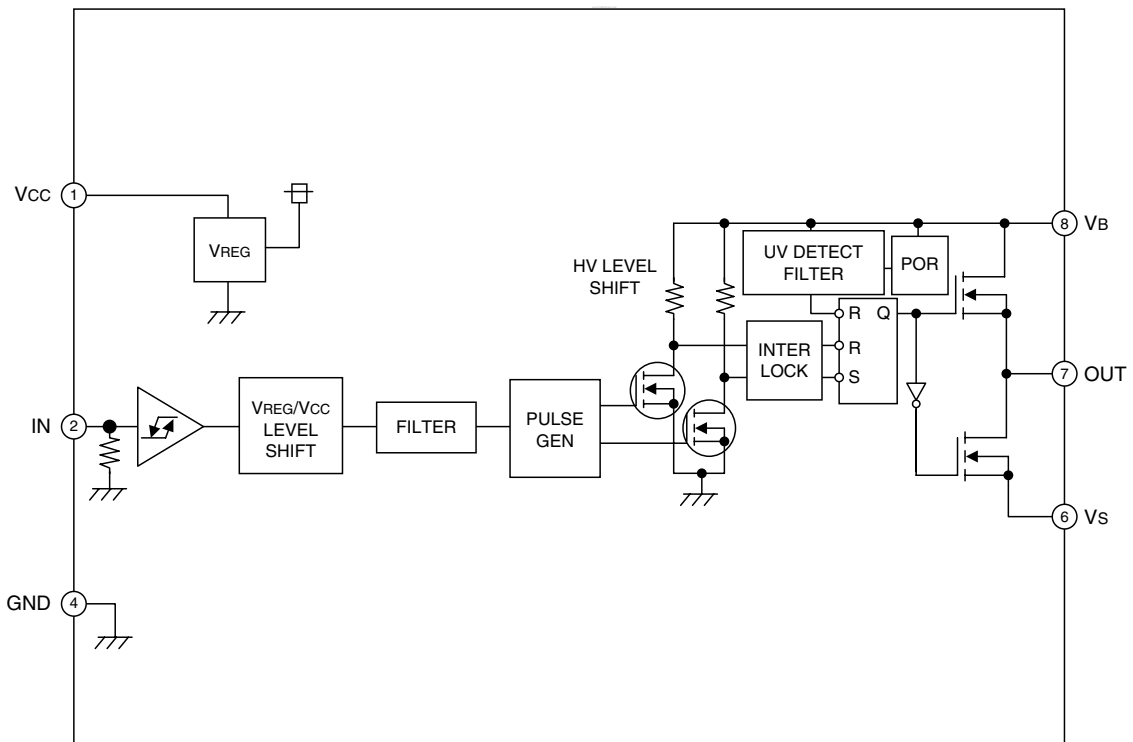
MOSFET and IGBT driver for PDP,HID lamp, refrigerator, air-conditioner, washing machine, AC-servomotor and general purpose.

PIN CONFIGURATION (TOP VIEW)



Outline:8P2S
NC: NO CONNECTION

BLOCK DIAGRAM



M81725FP

HIGH VOLTAGE HIGH SIDE DRIVER

ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Ratings	Unit
V _B	High Side Floating Supply Absolute Voltage		-0.5 ~ 624	V
V _S	High Side Floating Supply Offset Voltage		V _B -24 ~ V _B +0.5	V
V _{BS}	High Side Floating Supply Voltage	V _{BS} = V _B -V _S	-0.5 ~ 24	V
V _{OUT}	High Side Output Voltage		V _S -0.5 ~ V _B +0.5	V
V _{CC}	Low Side Fixed Supply Voltage		-0.5 ~ 24	V
V _{IN}	Logic Input Voltage	IN	-0.5 ~ V _{CC} +0.5	V
P _d	Package Power Dissipation	T _a = 25°C , On Board	0.6	W
K θ	Linear Derating Factor	T _a > 25°C , On Board	4.8	mW/°C
R _{th(j-c)}	Junction - Case Thermal Resistance		50	°C/W
T _j	Junction Temperature		-20 ~ 150*	°C
T _{opr}	Operation Temperature		-20 ~ 125	°C
T _{stg}	Storage Temperature		-40 ~ 150	°C
T _L	Solder heat-proof(flow)	For Pb Free	260(10s)	°C

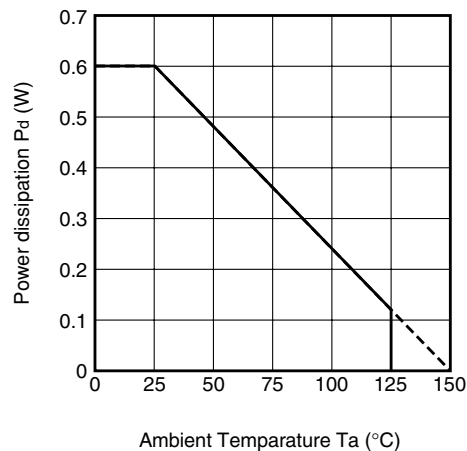
* Please adjust the V_S potential to 500V or less when the junction temperature (T_j) exceeds 125°C.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V _B	High Side Floating Supply Absolute Voltage		V _S +10	—	V _S +20	V
V _S	High Side Floating Supply Offset Voltage	V _B > 10V	-5	—	500	V
V _{BS}	High Side Floating Supply Voltage	V _{BS} = V _B -V _S	10	—	20	V
V _{OUT}	High Side Output Voltage		V _S	—	V _B	V
V _{CC}	Low Side Fixed Supply Voltage		10	—	20	V
V _{IN}	Logic Input Voltage	IN	0	—	7	V

* For proper operation, the device should be used within the recommended conditions.

THERMAL DERATING FACTOR CHARACTERISTIC (ABSOLUTE MAXIMUM RATINGS)

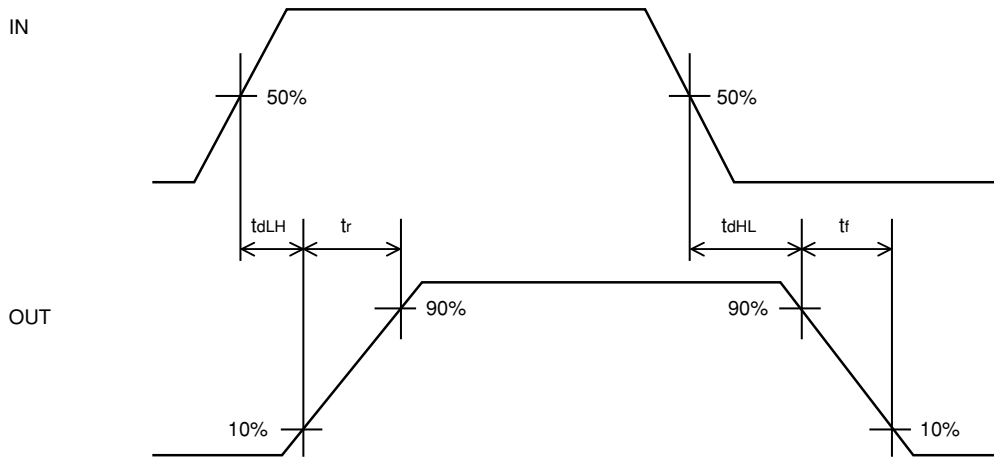


ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vcc=Vbs(=Vb-Vs)=15V, unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.*	Max.	
IFS	Floating Supply Leakage Current	V _B = V _S = 600V	—	—	1.0	μA
IBS	VBS standby Current	IN = 0V	—	0.2	0.5	mA
ICC	Vcc standby Current	IN = 0V	0.1	0.3	0.6	mA
VOH	High Level Output Voltage	IO = 0A, LO, HO	13.8	14.4	—	V
VOL	Low Level Output Voltage	IO = 0A, LO, HO	—	—	0.1	V
VIH	High Level Input Threshold Voltage	IN	4.0	—	—	V
VIL	Low Level Input Threshold Voltage	IN	—	—	0.8	V
IiH	High Level Input Bias Current	VIN = 5V	—	17	40	μA
IiL	Low Level Input Bias Current	VIN = 0V	—	0	1	μA
VBSuvr	VBS Supply UV Reset Voltage		8.0	8.9	9.8	V
VBSuvt	VBS Supply UV Trip Voltage		7.4	8.2	9.0	V
VBSuvh	VBS Supply UV Hysteresis Voltage		0.3	0.7	—	V
tVBSuv	VBS Supply UV Filter Time		—	7.5	—	μs
VPonr	Power-On Reset Voltage		—	—	6.0	V
tPonr(FIL)	Power-On Reset Filter Time		300	—	—	ns
IOH	Output High Level Short Circuit Pulsed Current	Vo = 0V, VIN = 5V, PWD < 10μs	2.0	3.0	—	A
IOL	Output Low Level Short Circuit Pulsed Current	Vo = 15V, VIN = 0V, PWD < 10μs	2.0	3.0	—	A
ROH	Output High Level On Resistance	Io = -200mA, ROH = (VOH-Vo)/Io	—	10	20	Ω
ROL	Output Low Level On Resistance	Io = 200mA, ROL = Vo/Io	—	2.5	3.0	Ω
tdLH	Turn-On Propagation Delay	CL = 1000pF between OUT-Vs	—	200	280	ns
tdHL	Turn-Off Propagation Delay	CL = 1000pF between OUT-Vs	—	180	260	ns
tr	Turn-On Rise Time	CL = 1000pF between OUT-Vs	—	25	45	ns
tf	Turn-Off Fall Time	CL = 1000pF between OUT-Vs	—	20	35	ns
IN(FIL)	Input Filter Time	CONVEX PULSE : IN	—	100	—	ns
		CONCAVE PULSE : IN	—	100	—	ns

* Typ. is not specified

TIMING REQUIREMENT



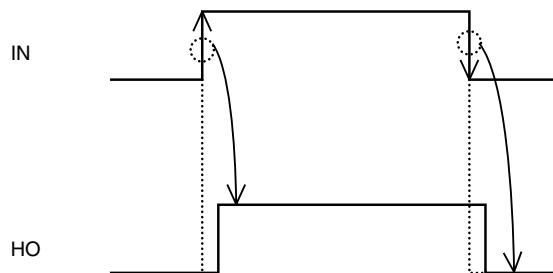
FUNCTION TABLE

IN	V _{BS} UV	OUT	Behavioral state
H→L	H	L	OUT = Low
L→H	H	H	OUT = High
X	L	L	OUT = Low, V _{BS} UV tripped

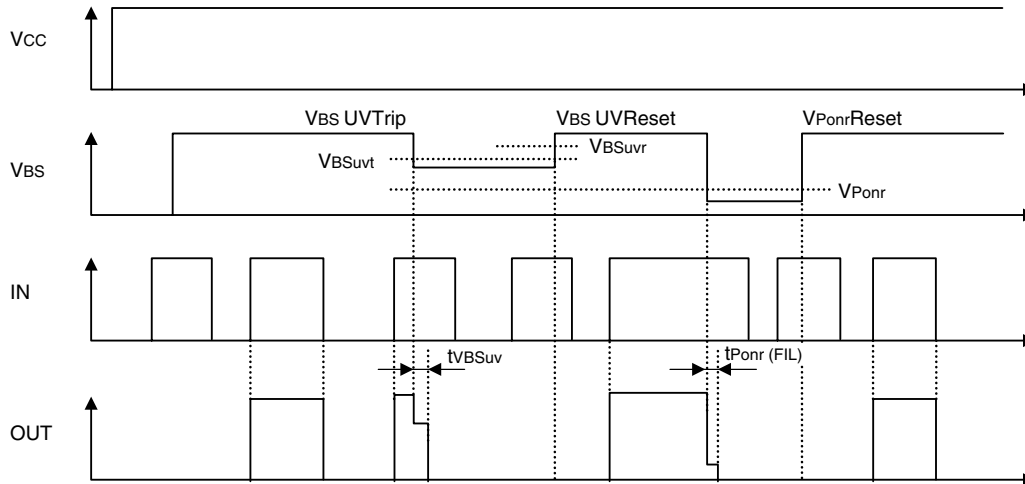
Note1 : "L" state of V_{BS} UV, V_{CC} UV means that UV trip voltage.

2 : X (IN) : L→H or H→L.

3 : Output signal (HO) is triggered by the edge of input signal.



Operation sequence Diagram



1. Input/Output Timing

HIGH ACTIVE (When input signal is "H", then output signal is "H".)

2. VBS Supply Under Voltage Lockout

If VBS supply voltage drops below UV trip voltage (V_{BSUVt}) for VBS supply UV filter time, output signal is shut down. As soon as VBS supply voltage rises over UV reset voltage, output signal HO becomes "H" at following "H" edge of input signal.

Note: If the VBS drops below V_{PON} , the filter time will become t_{POR} (FIL) instead of t_{VBSuv} .

3. Allowable Supply Voltage Transient

It is recommended to supply VCC firstly and supply VBS secondly. When shutting off supply voltage, please shut off VBS firstly and shut off VCC secondly. When applying VCC and VBS, power supply should be applied slowly. If it rises rapidly, output signal (HO or LO) may be malfunction.

Note: If VCC is below its recommended value: 10V, output may not response input signals.

Please take enough evaluation in the case of power supply shut down and power supply applying after its shut-down.

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PACKAGE OUTLINE

