MIP2L50MY

Silicon MOS FET type integrated circuit

■ Features

- Reducing the average noise
  Adding a frequency jitter function to MIP2E/3Exx series to dramatically reduce the average noise and simplify EMI parts.
- ILIMIT input correction function to reduce input voltage dependency of ILIMIT.
- Protecting function (overprotection, overheat protection)
- Overheating protection function
  Changed from stopping in latch mode to self reset type

■ Package

- Code
  TO-220-A2
- Pin Name
  1. CONTROL
  2. SOURCE
  3. DRAIN

■ Marking Symbol: MIP2L5MY

■ Applications

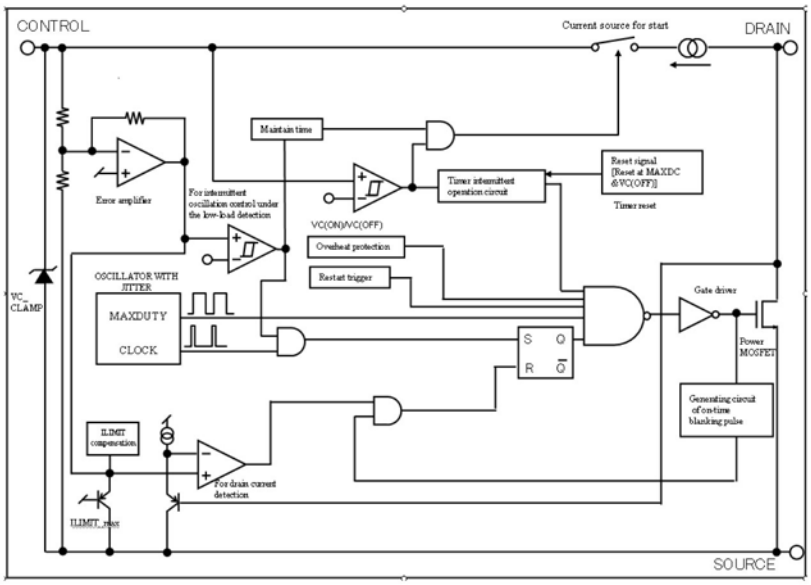
- Flat-screen TV, audio and others

■ Absolute Maximum Ratings $T_a = 25°C \pm 3°C$

Parameter	Symbol	Rating	Unit
DRAIN voltage	VD	– 0.3 to +700	V
CONTROL voltage	VC	– 0.3 to +8	V
Output peak current *	IDP	3.5	A
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note) *: The guarantee within the following pulse width.
Leading edge blanking delay + Current limit delay ton(BLK) + td(OCL)

■ Block Diagram

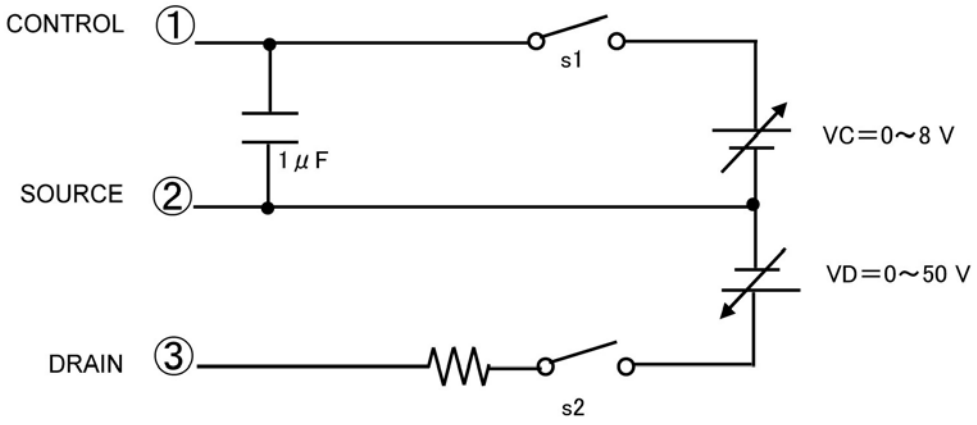


■ Electrical Characteristics T_C = 25°C±3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Control functions						
Output frequency	fosc	VC = VC(CNT) – 0.2 V, VD = 5V	92	100	108	kHz
Jitter frequency deviation *2	Δf	VC = VC(CNT) – 0.2 V, VD = 5V		5.5		kHz
Jitter frequency modulation rate *1, 2	fM	VC = VC(CNT) – 0.2 V, VD = 5V		270		Hz
Maximum duty cycle	MAXDC	VC = VC(CNT) – 0.2 V, VD = 5V	50	53	56	%
PWM gain *1	GPWM	VC = VC(CNT)		12.5		dB
Before auto-restart current	IC(SB)1	VC < VC(ON), VD = 5 V	0.2	0.5	0.8	mA
After off-state current	IC(SB)2	VC > VC(CNT), VD = 5 V	0.2	0.5	0.8	mA
Operating current	IC(OP)	VC = VC(CNT) – 0.2 V, VD = 5V	0.25	0.7	1.15	mA
Auto-restart threshold voltage	VC(ON)	VD = 5V	5.75	6.25	6.75	V
UV lockout threshold voltage	VC(OFF)	VD = 5V	4.35	4.8	5.25	V
Auto-restart maintain voltage	VC_m	S1 = OPEN	4.95	5.45	5.95	V
Auto-restart maintain time	Tm	S1 = OPEN		45		ms
Auto-restart hysteresis voltage	ΔVC	VC(ON) – VC(OFF)	1.05	1.45	1.85	V
Control clamp voltage	VC(CLP)	IC = 3 mA	6.2	6.8	7.4	V
Auto-restart duty cycle *3	TSW/TTIM	S1 = OPEN		12		%
Auto-restart frequency *3	fTIM	S1 = OPEN		2.6		Hz
Control pin charging current	IC(CHG)1	VC = 0 V, VD = 50 V	–14	–9	–6	mA
	IC(CHG)2	VC = 5 V, VD = 50 V	–10.6	–5.4	–2.3	mA
Control pin voltage	VC(CNT)	VD = 5 V	5.3	5.9	6.5	V
Control pin voltage hysteresis *1	ΔVC(CNT)	VD = 5 V		10		mV
Circuit protections						
Self protection current limit *4, 5	ILIMIT	Duty = 30%	1.65	1.8	1.95	A
ILIMIT modified coefficient *4, 5	R_slope	VC = VC(CNT) – 0.2 V		35		mA/μs
Leading edge blanking delay *1	ton(BLK)		240	300	360	ns
Current limit delay *1	td(OCL)		100	150	200	ns
Thermal shutdown temperature *1	TOTP		130	140	150	°C
Thermal shutdown temperature hysteresis *1	ΔTOTP			70		°C
Output						
Power-up reset theshold voltage *1	VCreset		1.8	2.6	3.5	V
ON-state resistance	RDS(ON)	ID = 0.3 A		3.8	5	Ω
OFF-state leakage current	IDSS	VD = 650 V, VC = 6.5 V		10	20	μA
Breakdown voltage	VDSS	ID = 100 μA, VC = 6.5 V	700			V
Rise time *6	tr	VC = VC(CNT) – 0.2 V, VD = 5 V		130		ns
Fall time *6	tf	VC = VC(CNT) – 0.2 V, VD = 5 V		30		ns
Supply voltage characteristics						
Drain supply voltage	VD(MIN)	S1 = OPEN	36			V

■ Electrical Characteristics (continued) T_C = 25°C±3°C

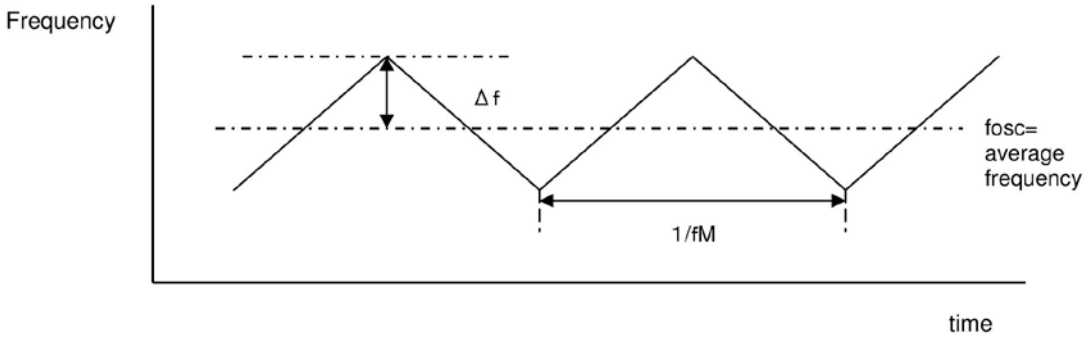
1. Measurement circuit



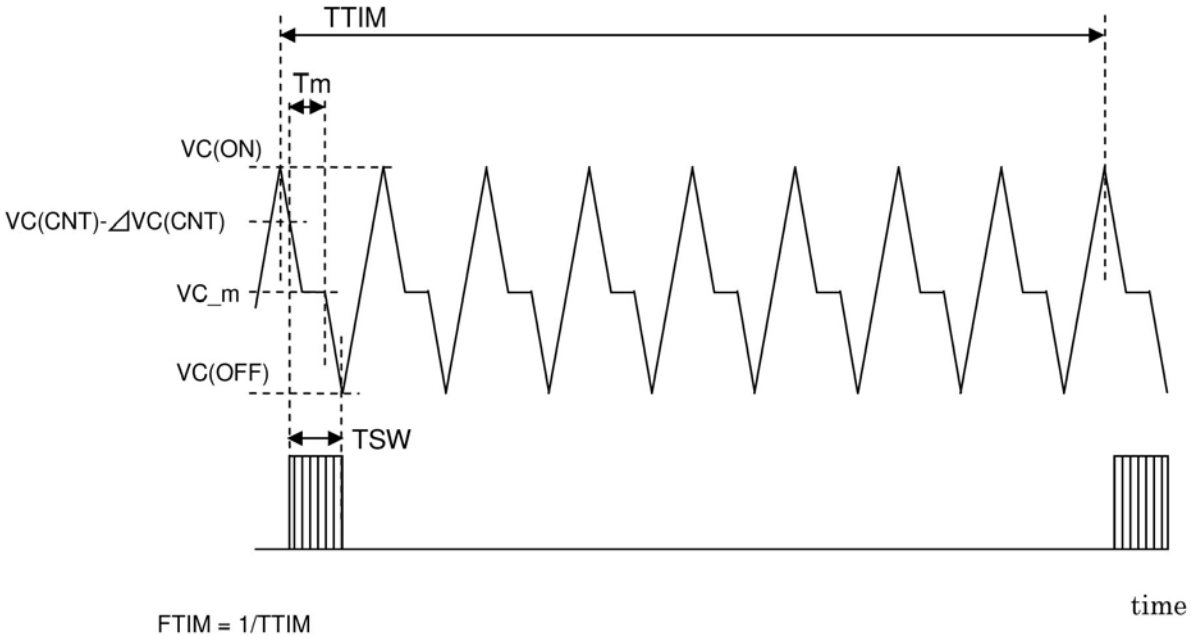
∗ This measurement circuit can't be useful for ILIMIT measurement

2. ∗1 : Design guarantee item

∗2 : Δf, fM measurement



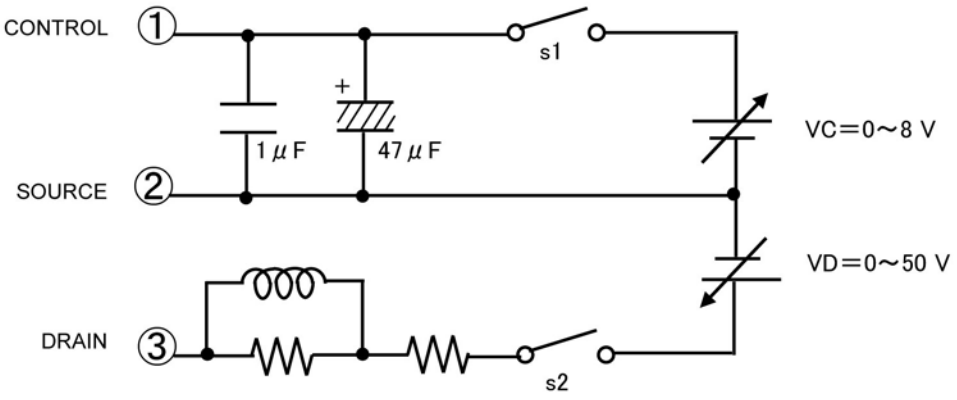
∗3 : VC_m, Tm, TTSW, TTIM, fTIM measurement



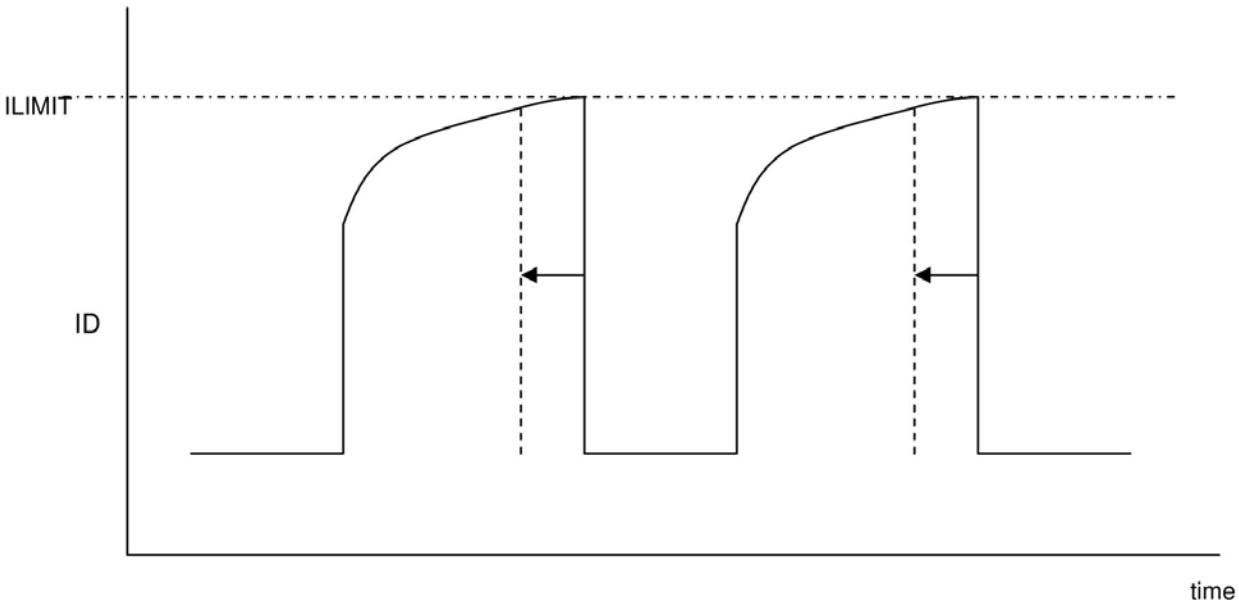
FTIM = 1/TTIM

■ Electrical Characteristics (continued) T_C = 25°C±3°C

2. *4 : Measurement circuit 2

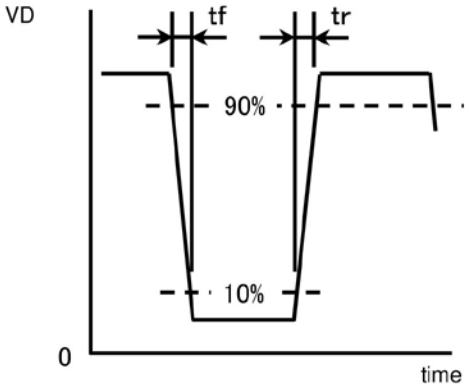


*5 : ILIMIT measurement



R_slope = {(ILIMIT at Duty=30%)-(ILIMIT at Duty=20%)} / {(Ton at Duty=30%)-(Ton at Duty=20%)}

*6 : tr, tf measurement



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MIP00** MIP55** MIP816/826	MIP52** MIP56** MIP9E**	MIP53** MIP803/804	· Japanese companies in Japan · Japanese companies in Asia (50% or more owned) · Asian companies in Asia	· Companies in European and American countries · Other local companies	· For power supply · For EL driver · For LED lighting driver
MIP50**	MIP51**	MIP7**	· No restrictions in terms of contract	· No restrictions in terms of contract	· For lamp driver/ car electronics accessories

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