Notification about the transfer of the semiconductor business

The semiconductor business of Panasonic Corporation was transferred on September 1, 2020 to Nuvoton Technology Corporation (hereinafter referred to as "Nuvoton"). Accordingly, Panasonic Semiconductor Solutions Co., Ltd. became under the umbrella of the Nuvoton Group, with the new name of Nuvoton Technology Corporation Japan (hereinafter referred to as "NTCJ").

In accordance with this transfer, semiconductor products will be handled as NTCJ-made products after September 1, 2020. However, such products will be continuously sold through Panasonic Corporation.

Publisher of this Document is NTCJ.
If you would find description “Panasonic” or “Panasonic semiconductor solutions”, please replace it with NTCJ.

※ Except below description page
“Request for your special attention and precautions in using the technical information and semiconductors described in this book”

Nuvoton Technology Corporation Japan

Panasonic MIP2E1DMTSCF

種別／Type	シリコンＭＯＳ形集積回路／Silicon MOSFET type Integrated Circuit		
用途／Application	ｽｲｯﾁﾝｸﾞ電源制御用／For a Switching Power Supply Control		
構造／Structure	ＣＭＯＳ形／CMOS Type		
外形／Out line	ＤＩＰ７－Ａ１－Ｂ	ﾏｰｸ記号／ﾏｰｷﾝｸﾞ／Marking	ＭＩＰ２Ｅ１Ｄ

Ａ．絶対最大定格／Absolute Maximum Ratings

No.	項目／Item	記号／Symbol	定格／Ratings	単位／Unit
1	ドレイン電圧 DRAIN Voltage	ＶＤ	７００	V
2	コントロール電圧 CONTROL Voltage	ＶＣ	１０	V
3	出力電流 Output Current	ＩＤ	０．４３	A
4	出力ピーク電流 Output Peak Current	ＩＤＰ	０．６１	A
5	コントロール電流 CONTROL Current	ＩＣ	０．１	A
6	チャネル部温度 Channel Temperature	Ｔｃｈ	１５０	℃
7	保存温度 Storage Temperature	Ｔｓｔｇ	－５５ ～ ＋１５０	℃

Ｂ．電気的特性／Electrical characteristics　　測定条件／Measure condition (Tc=25℃±3℃)

No.	項目／Item	記号／Symbol	測定条件／Measure Condition (別紙測定図-1参照／See Figure 1)	Typ.	Limit Min	Limit Max	Unit
【コントロール機能／Control functions：*は設計保証項目/Design Guarantee Item】							
1	出力周波数 Output Frequency	fosc	Vc=Vc(CNT)-0.2V	100	90	110	kHz
2	最大ﾃﾞｭｰﾃｨｰｻｲｸﾙ Maximum Duty Cycle	MAXDC	Vc=Vc(CNT)-0.2V	69	66	72	%
*3	ＰＷＭｹﾞｲﾝ PWM Gain	GPWM		11			dB
*4	ｽﾛｰﾌﾟ補償値 Slope Compensate Value	m		15			mA/us
【電源／Supply：*は設計保証項目/Design Guarantee Item】							
5	起動前動作電流 Before Auto-restart Current	IC(SB)	VC＜VC(ON)　（２）	0.30	0.05	0.6	mA
6	動作時電流 Operating Current	IC(OP)	VC=VC(CNT)-0.2V　（２）	1.8	0.7	2.7	mA
7	起動時ｺﾝﾄﾛｰﾙ端子電圧 Auto-restart Threshold Voltage	VC(ON)	S1=OPEN　（２）	6.0	5.1	6.6	V
8	停止時ｺﾝﾄﾛｰﾙ端子電圧 UV Lockout Threshold Voltage	VC(OFF)	S1=OPEN　（２）	5.0	4.1	5.5	V

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9	起動/停止ﾋｽﾃﾘｼｽ電圧 Auto-restar hysteresis Voltage	⊿VC	S1=OPEN （２）	1.0	0.5	1.5	V
10	間欠動作時間比 Auto-restart duty cycle	TSW/TTIM	S1=OPEN	2			%
11	間欠動作周波数 Auto-restart frequency	fTIM	S1=OPEN	0.5			Hz
12	ｺﾝﾄﾛｰﾙ端子充電電流 CONTROL Pin Charging Current	IC(CHG)	VC=0V	-1.9	-2.5	-1.2	mA
			VC=5V	-1.2	-2.0	-0.5	mA
13	ｺﾝﾄﾛｰﾙ電圧 CONTROL Pin Voltage	VC(CNT)		6.2	5.7	6.6	V
*14	ｺﾝﾄﾛｰﾙ電圧ﾋｽﾃﾘｼｽ CONTROL Pin Voltage hysteresis	⊿ VC(CNT)		10			mV
15	最小ﾄﾞﾚｲﾝ電圧 DRAIN Supply Voltage	VD(MIN)			36		V
	【保護機能／Circuit protection：*は設計保証項目/Design Guarantee Item】						
16	過電流保護検出 Self-protection Current Limit	ILIMIT		0.375	0.335	0.415	A
*17	ｵﾝ時ﾌﾞﾗﾝｷﾝｸﾞ幅 Leading Edge Blanking Delay	ton(BLK)		0.25			μs
*18	過電流保護遅れ時間 Current Limit Delay	td(OCL)		0.1			μs
*19	過熱保護温度 Thermal Shutdown Temperature	TOTP		140	130		℃
*20	ﾗｯﾁﾘｾｯﾄ電圧 Power-up Reset Threshold Voltage	Vcreset	S2=OPEN	3.3	2.3	4.2	V
	【出力／Output：*は設計保証項目/Design Guarantee Item】						
21	ｵﾝ抵抗 On-State Resistance	RDS(ON)	ID=0.1A (See Figure 2)	23		27	Ω
22	ｵﾌ時ﾄﾞﾚｲﾝ端子ﾘｰｸ電流 OFF-State Current	IDSS	VDS=650V, Vc=6.5V	10		250	uA
23	ﾄﾞﾚｲﾝ耐圧 Breakdown Voltage	VDSS	ID=0.25mA, Vc=6.5V		700		V
24	立ち上がり時間 Rise tim	tr	（１）	0.1			μs
25	立ち下がり時間 Fall time	tf	（１）	0.1			μs
*26	熱抵抗 Thermal resistance (j-a)	Rth (j-a)	ｴﾎﾟｷｼ基板(3cm×3cm)実装時 Ta=25℃ Surface Mounted on Epoxy Bord	90			℃/W

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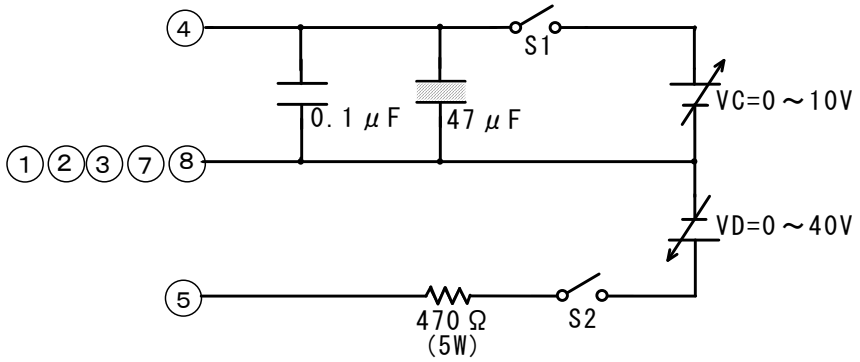
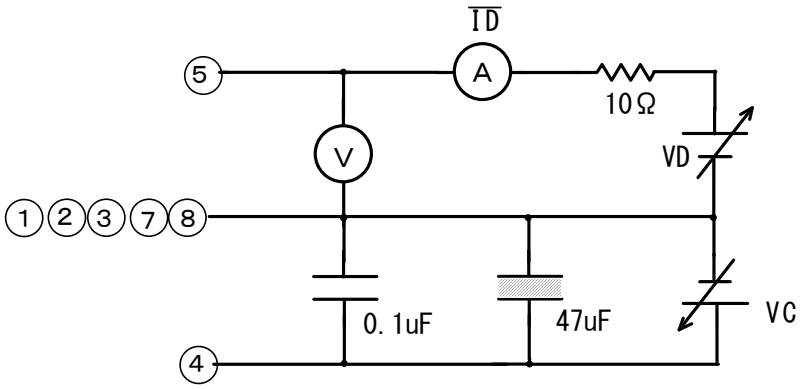
【Figure 1：測定回路図／Measure Circuit】



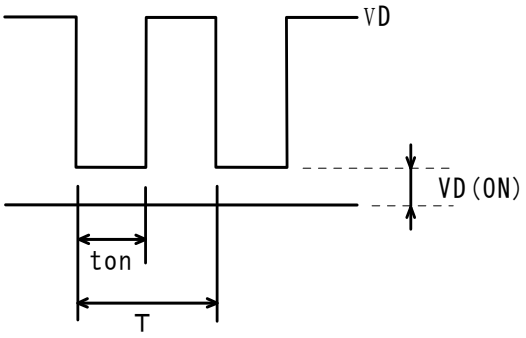
＊本測定回路は、過電流保護検出値、出力特性の測定には使用できません。
This measurement circuit can't be useful for peak current and output characteristic measurement.

【Figure 2：測定回路図／Measure Circuit】



$$Ron = \frac{VD(ON)}{\overline{ID}} \times \frac{ton}{T}$$

端子説明／Terminal explanation
④：Control
①②③⑦⑧：Source
⑤：Drain



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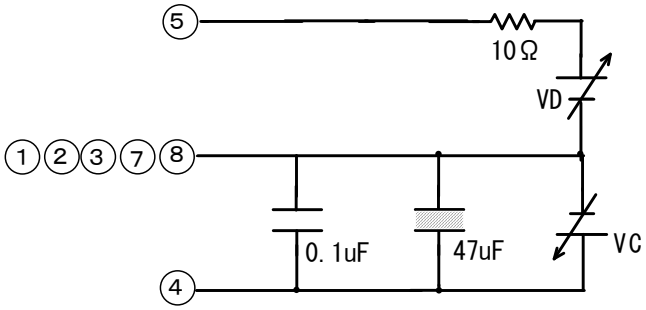
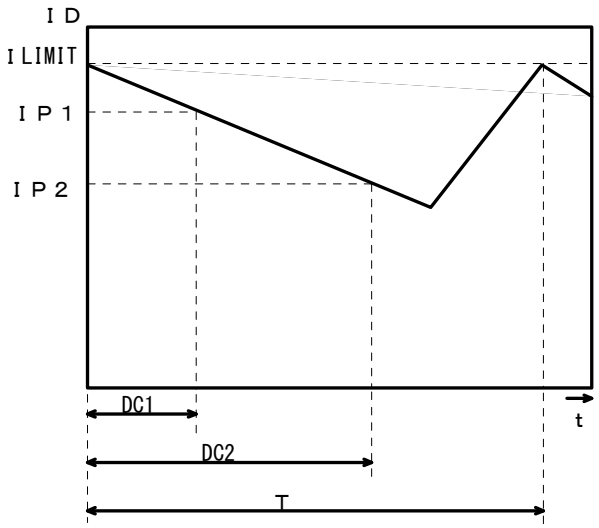
【Figure 3 : 測定回路図／Measure Circuit】





$$ILIMIT = \frac{DC2 \cdot IP1 - DC1 \cdot IP2}{DC2 - DC1}$$

$$m = fosc \cdot \frac{IP1 - IP2}{DC2 - DC1}$$

端子説明／Terminal explanation
④ : Control
①②③⑦⑧ : Source
⑤ : Drain

＊DC1, DC2は、VDをそれぞれVD1, VD2にしたときのﾃﾞｭｰﾃｨｰｻｲｸﾙ (0＜DC1＜DC2＜MAXDC)
／DC1,DC2 is duty cycle when VD is VD1 and VD2,respectively.

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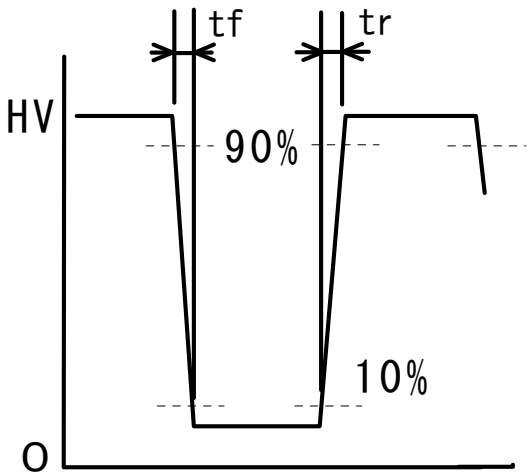
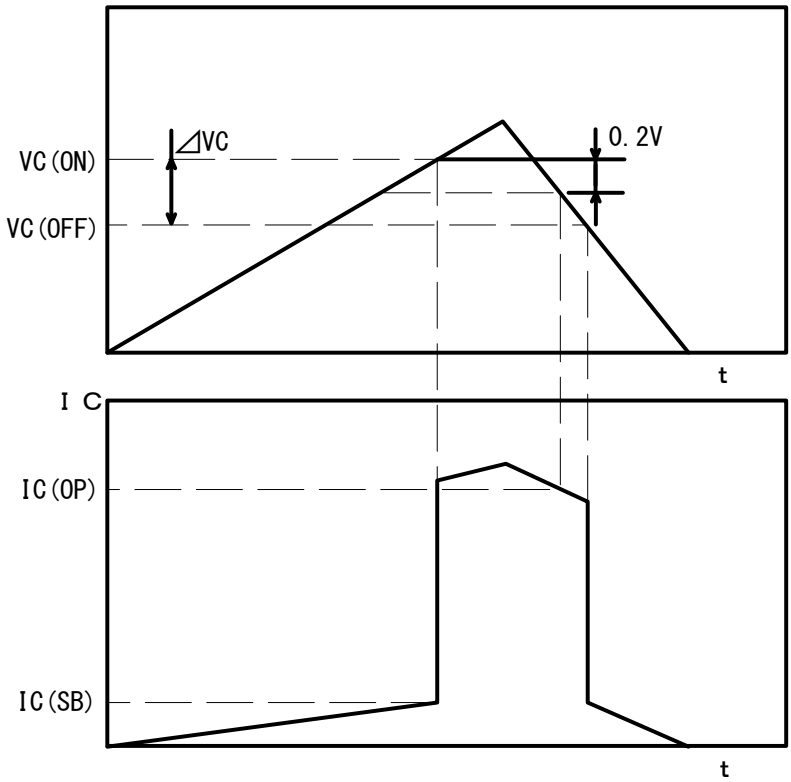
【ＮＯＴＥ（1）】



（2）



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