Introduction

New !

Fuji Smart power device ：M-POWER2 for Multi-oscillated current resonant type power supply

Summary

System: **The ideal and Fuji's original system**
It includes many functions(Soft-switching,stand-by).

Device： **Multiple-chip Power Device：M-POWER2**
contains IC and two MOSFETs in SIP-13pin package.
M-POWER has various types of protection functions.

Features

1. High efficiency (a reduction in SMPS size is possible.)
   DC/DC : 92.3%(DC input:400V,output:16V)
   PFC+DC/DC :87.0%(AC100V),89.5%(AC200V)

2. Built in stand-by mode (An auxiliary power supply is unnecessary.)
   P_{in}<0.4W at P_{out}=0.0W
   P_{in}<1.0W at P_{out}=0.5W
   P_{in}<4.0W at P_{out}=2.0W

3. Low noise
   (a reduction in the noise suppression parts is possible.)
   MOSFETs: Turn-on : ZVS+ZCS
   Turn-off : ZVS
   Diodes(secondary side)
   Surge voltage does not occur at reverse recovery.

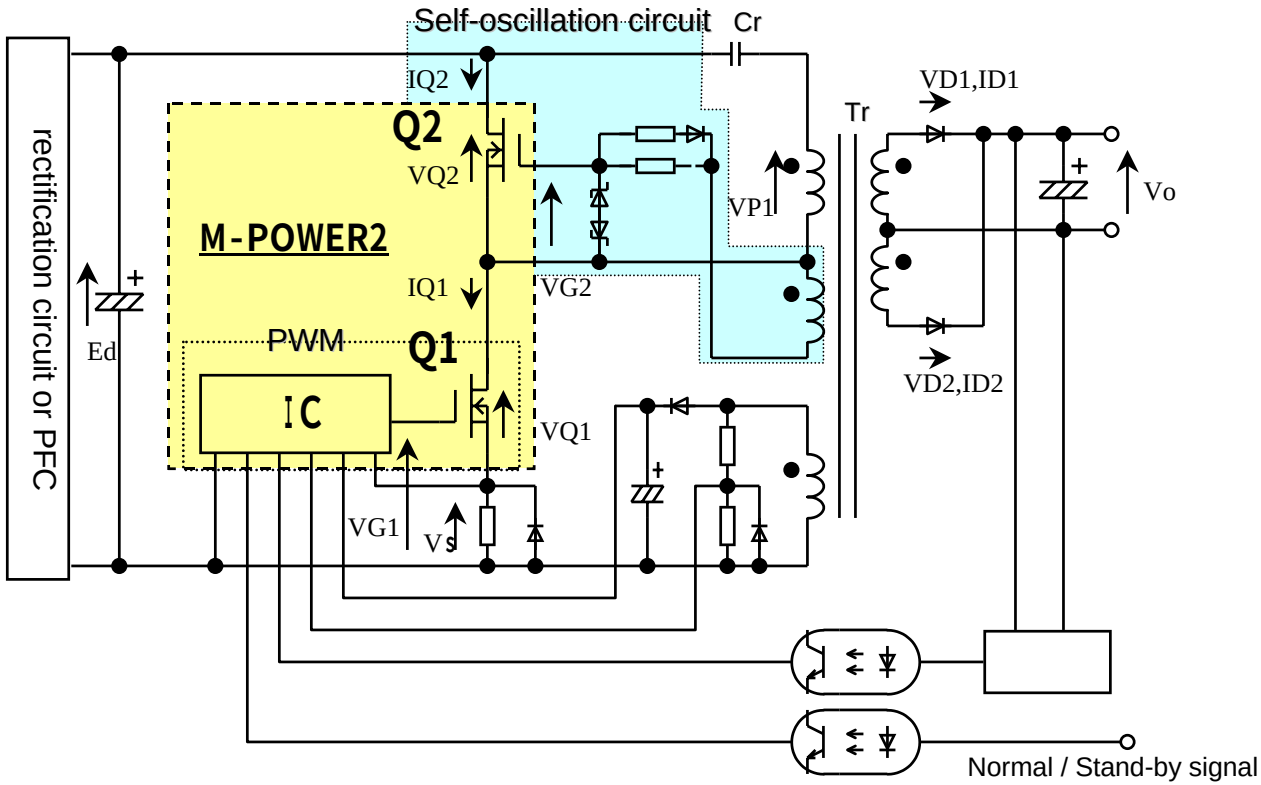
4. Fail-safety (Built in protection functions:OC,SC,OV,Tj(OH))

5. Easy design power supply (Reduction of design time)

Down size your SMPS

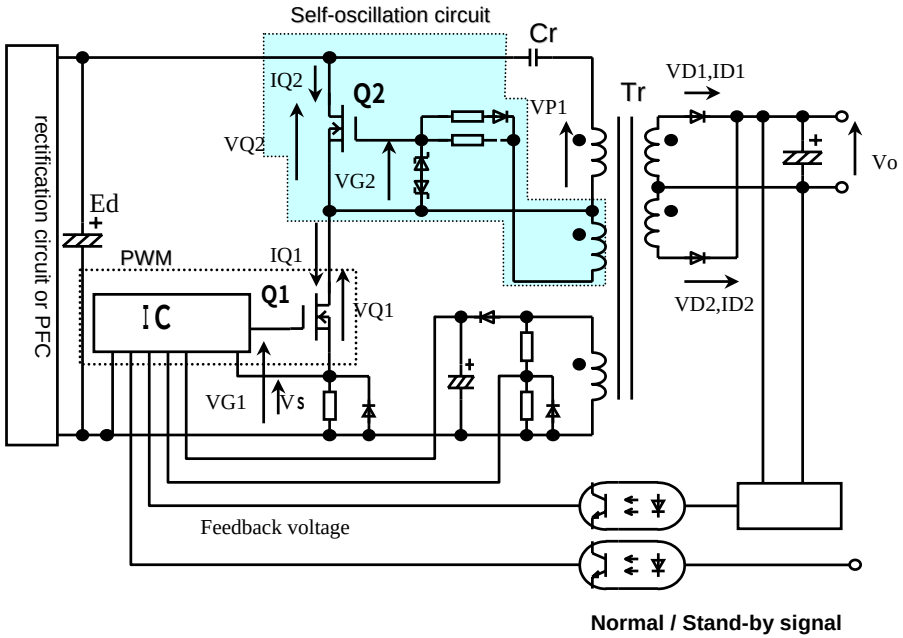
Circuit configuration

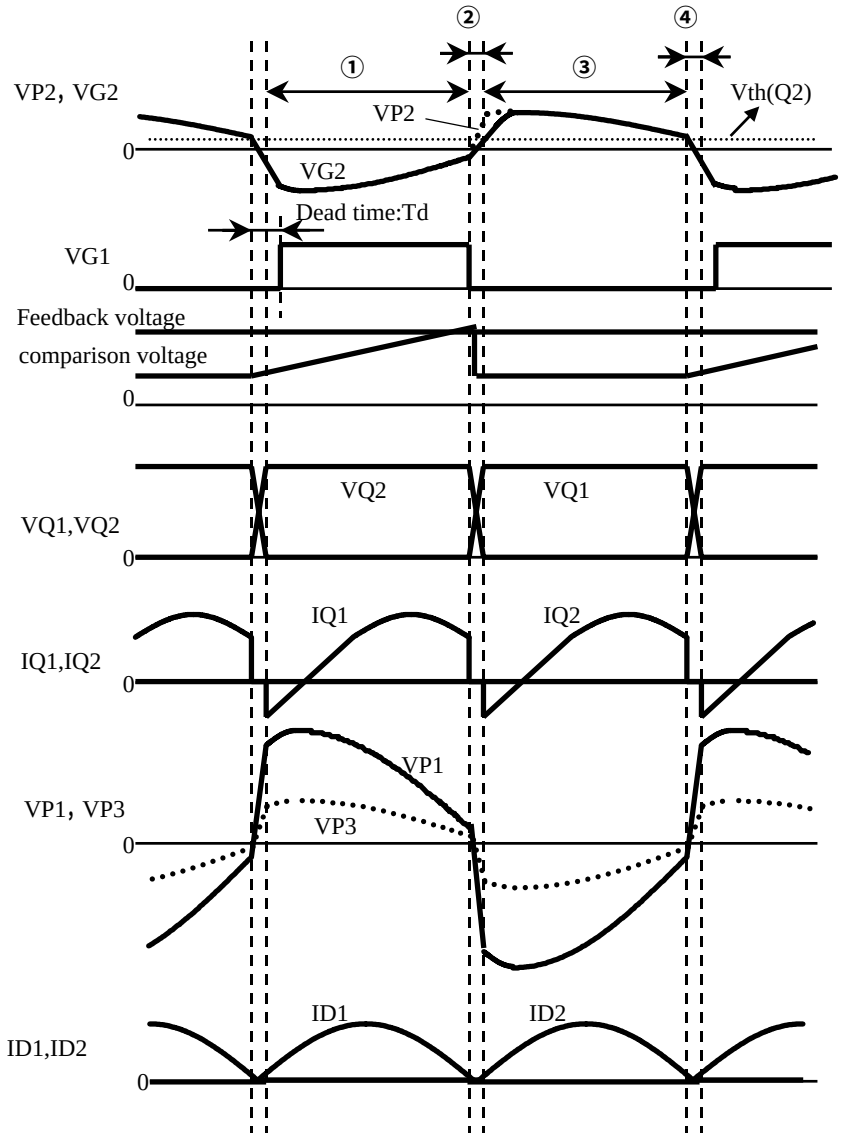
Multi-oscillated current resonant type power supply



Q1 ------ PWM oscillation
Q2 ------ self-oscillation (driven by winding voltage).

Operation of switching transient





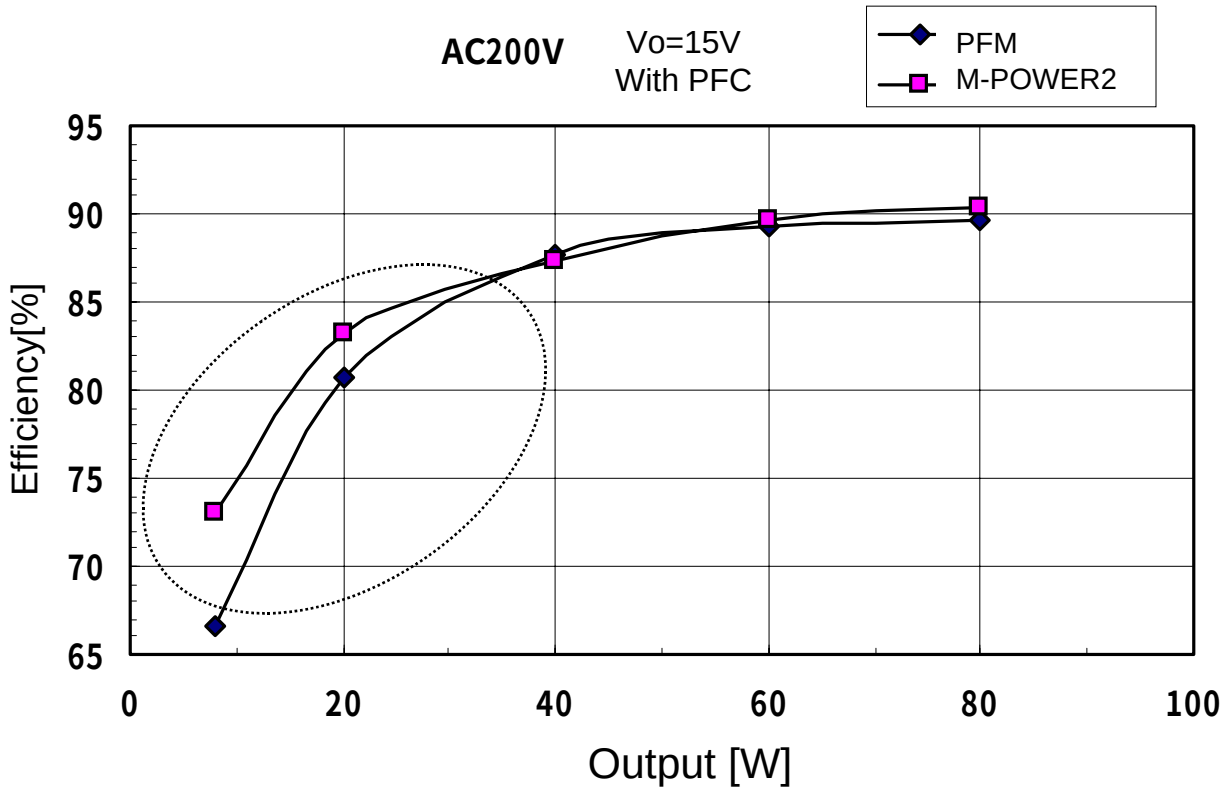
Features of the Multi-oscillation

1) No arm-short circuit.

2) it is high efficiency at light load too.

Efficiency comparison

PFM V.S. M-POWER2(Muiti oscillation)



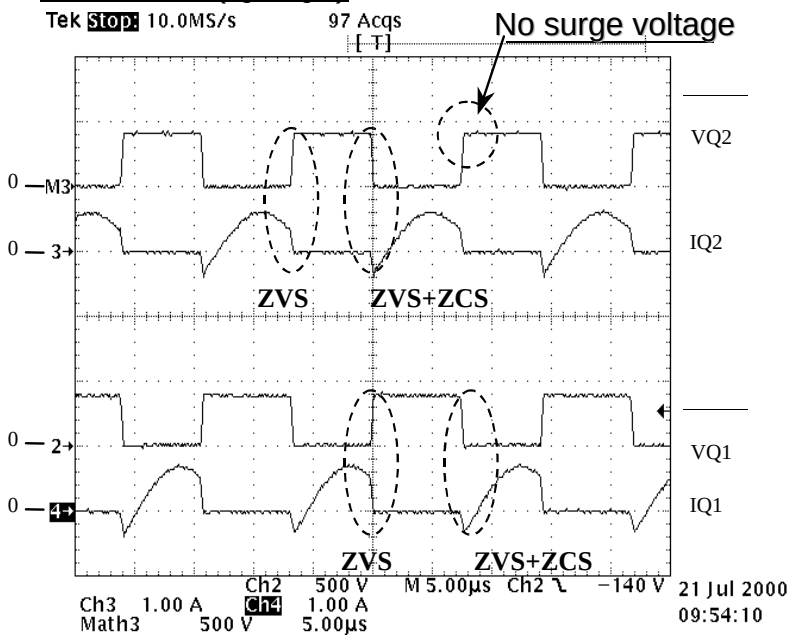
It is high efficiency at light load too.

Switching waveforms

Ultra Low Noise

Condition:Ed=400V,Po=65W,Vo=16V

MOSFETs(Q1,Q2)

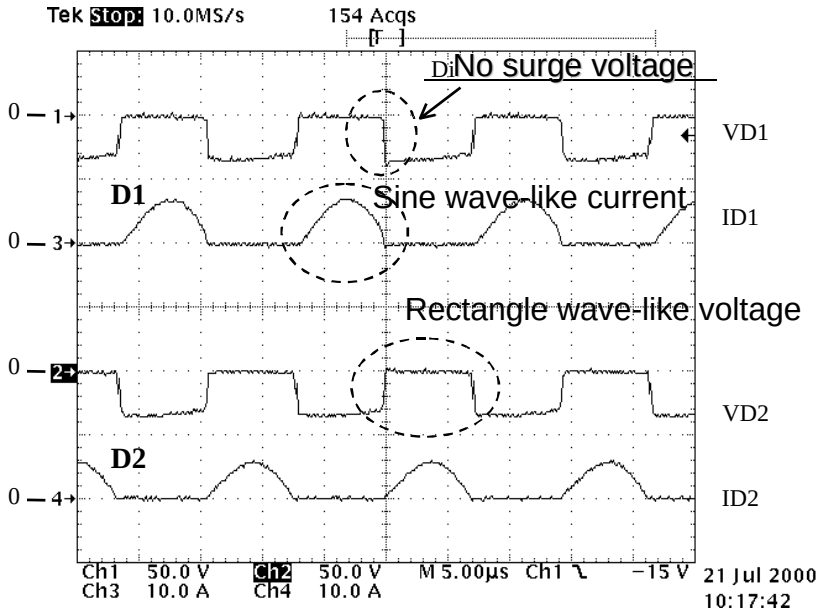


Turn-on : ZVS+ZCS
Turn-off : ZVS
No surge voltage at Turn-off

VQ1 :500V /DIV
IQ1 :1A /DIV
VQ2 :500V /DIV
IQ2 :1A /DIV

5us/DIV

Diodes(Secondary side)



No surge voltage at reverse recovery

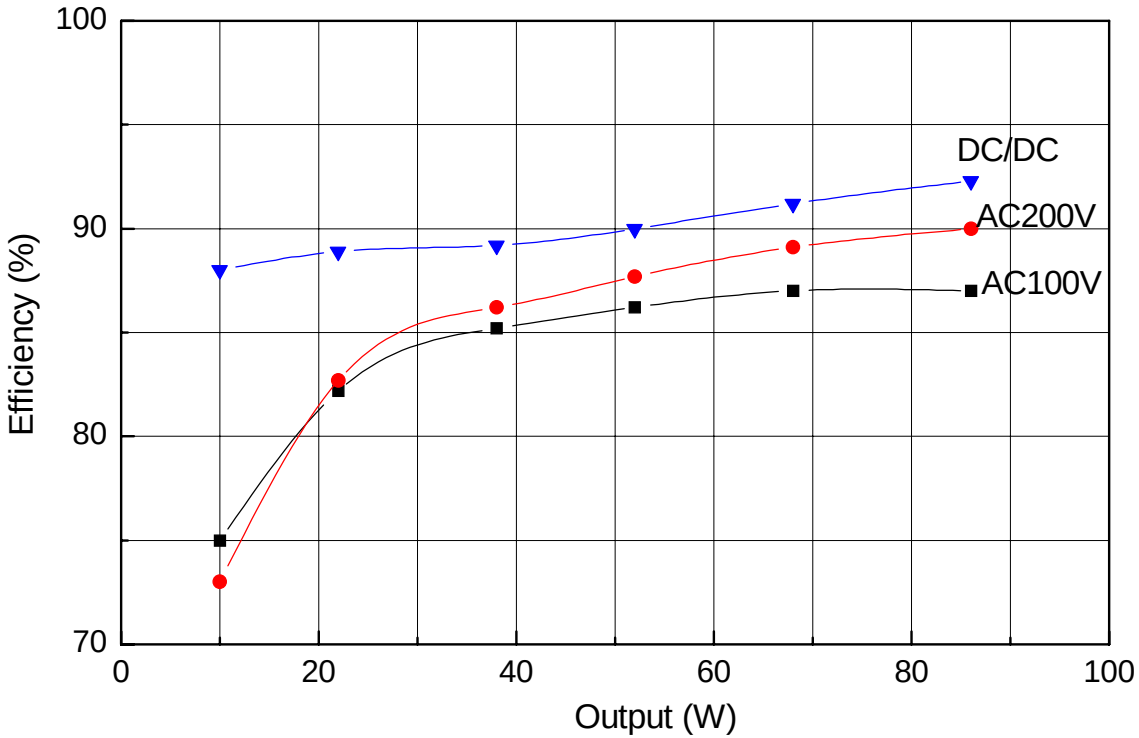
VD1:50V /DIV
ID1:10A /DIV
VD2:50V /DIV
ID2:10A /DIV

5us/DIV

Reduction in the noise suppression parts is possible.

Characteristic

High efficiency



Efficiency - Load characteristic at normal mode

DC/DC : 92.3%
(DC input:400V,output:16V)

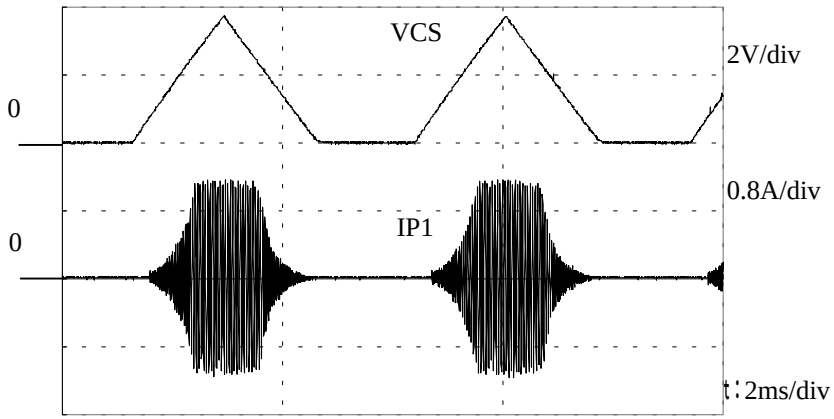
PFC+DC/DC:87.0%
(AC100V),89.5%(AC200V)

Down size your SMPS

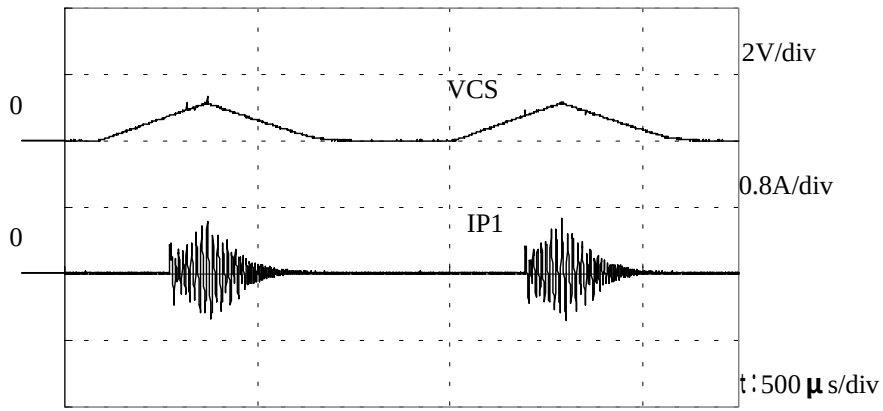
Performance

Power saving operation

'Soft-start and soft-end switching of M-POWER2 reduce transformer noise.



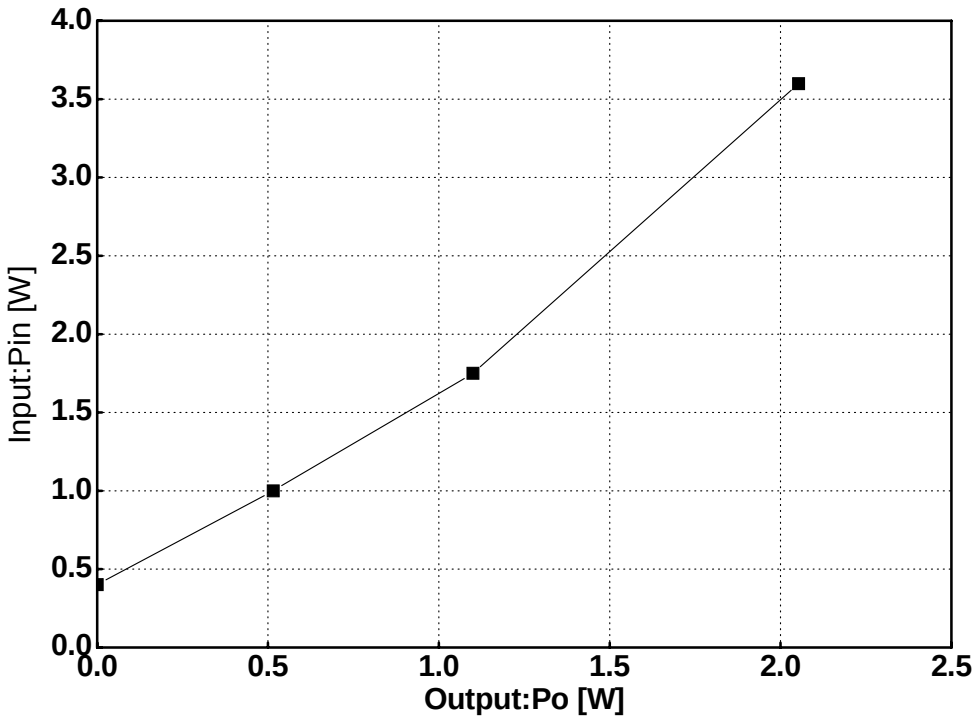
Condition:AC100V,Pout=0.5W



Condition:AC240V,Pout=0.5W

Characteristic

Power saving operation



Input power – output power characteristic at standby mode

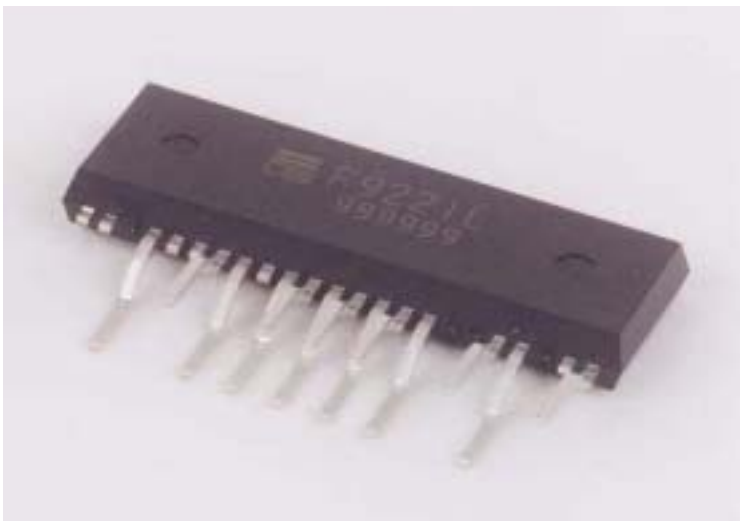
P_{in}<0.4W at P_{out}=0.0W
P_{in}<1.0W at P_{out}=0.5W
P_{in}<4.0W at P_{out}=2.0W

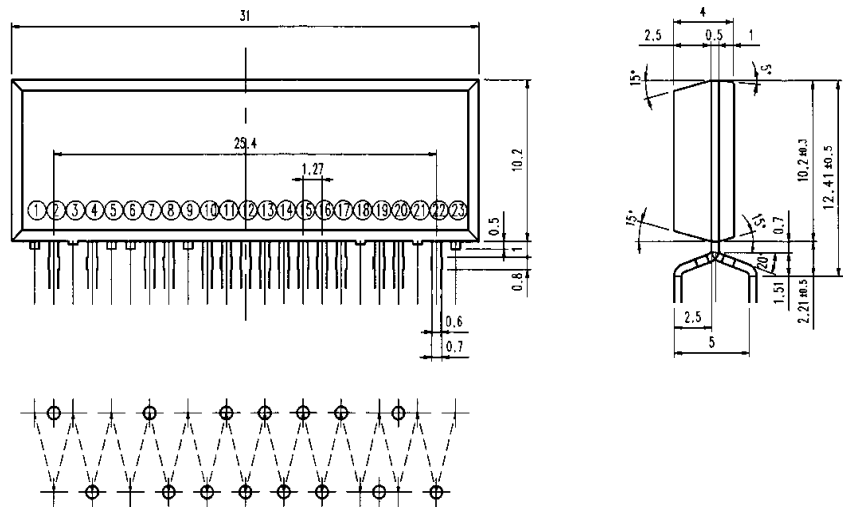
No sub power supply required for stand-by

M-POWER2

Type name	Main-MOSFET		Sub-MOSFET		Control IC		Sample
	V_{DS}	$R_{DS(ON)}$	V_{DS}	$R_{DS(ON)}$	$V_{CC(ON)}$	$T_{j(OH)}$	
F9221L	500V	0.9 Ω	500V	0.9 Ω	16.5V	125～150℃	M/P
F9222L	500V	0.6 Ω	500V	0.6 Ω	16.5V	125～150℃	02/09

External view of M-POWER2





PKG：H:10.2mm×W:31.0mm×T:3.5mm

Unit:mm