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日本PPJ 脉冲功率电源产品介绍

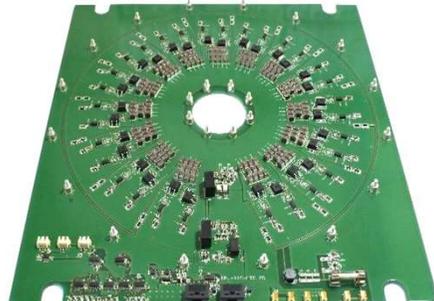
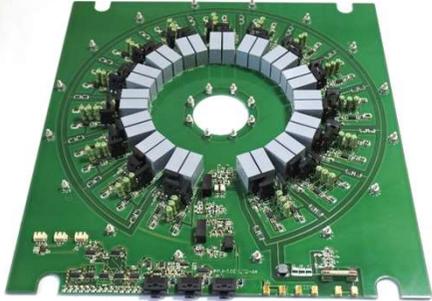
中国总代理:

秦皇岛市燕秦纳米科技有限公司

SiC LTD for pulsed kicker magnet

【 Main board 】

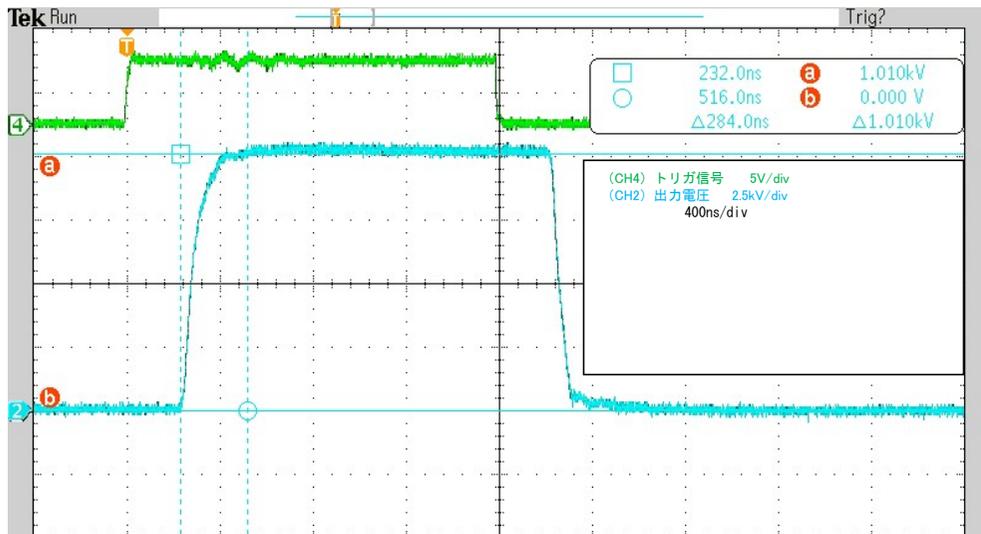
【 Circuit correction board 】



応用例	
加速器用	加速器用
キッカー電磁石用	脉冲冲击磁铁用

Output voltage	800 Vp (Main board), 100 Vp (compensation board)
Output current	2 kAp
Pulse width	1.5 μ s
Repetition	25 Hz
Rise time	<250 ns
Interlock	control voltage drop, charge voltage drop, high temperature

(Example) 13 main boards and 11 compensation boards to be stacked



Output Voltage	10.1kVp, Output Current 2 kAp
Pulse width	1.53 μ s
Rise time	127ns

MARX type high voltage pulse generator

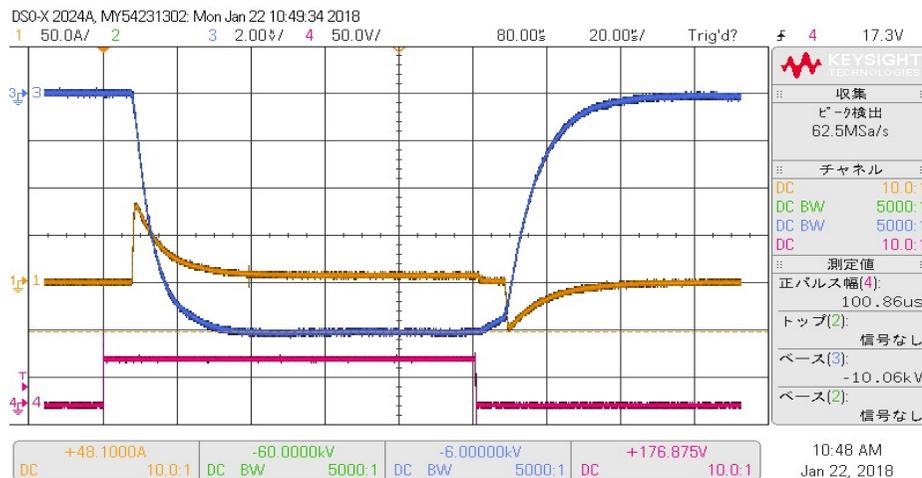


Charging Voltage -2.5kV
 Output Voltage -100kVp
 Output Current 10Ap
 Pulse Width 50us~200us
 Repetition 10Hz
 Device used IGBT

Gate power is provided from each MARX capacitor

応用例

加速器用	加速器用
電子銃用	電子銃用



CH3 (B): Output voltage

20kV/div

100kV

CH1 (Y): Output current

50A/div

peak 88A、DC 10A

CH4 (M): Trigger signal

20us/div

Pulse width

100us

Rise time

15us

Fall time

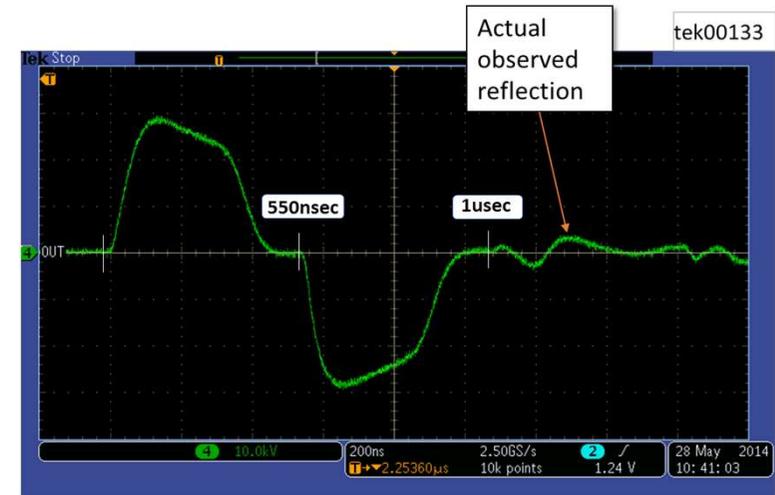
20us

Solid-state Marx Generator for Muon Kicker

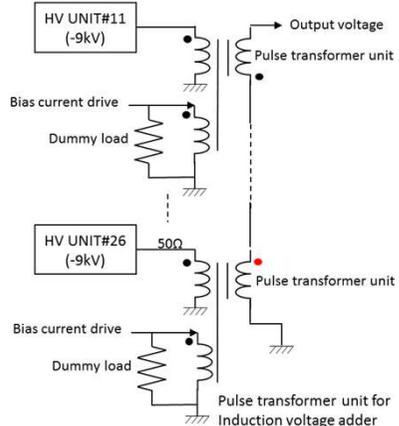


Output Voltage $\pm 54\text{kVp}$
 Pulse Width $300\text{ns}+300\text{ns}$
 Repetition 50Hz

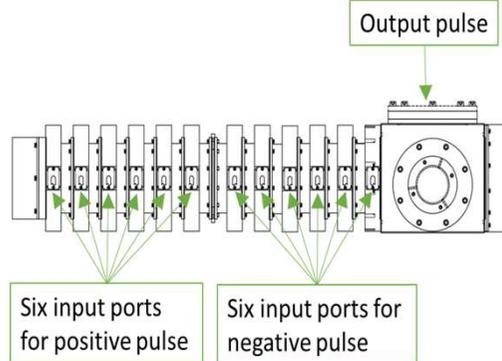
応用例	
加速器用	加速器用
静電キッカー用	静电冲击用



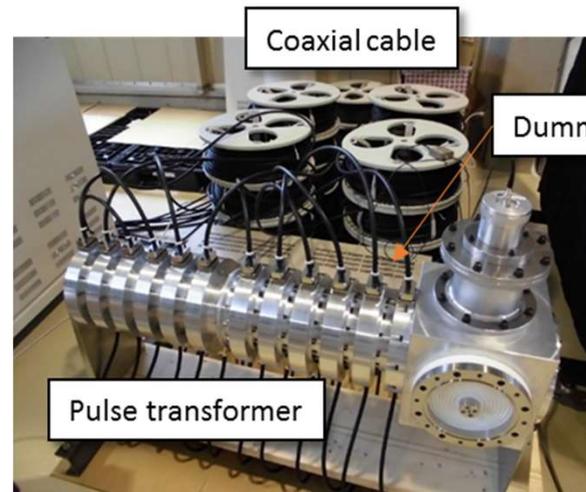
Bipolar Induction voltage adder



Pulse transformer type Bipolar Induction voltage adder



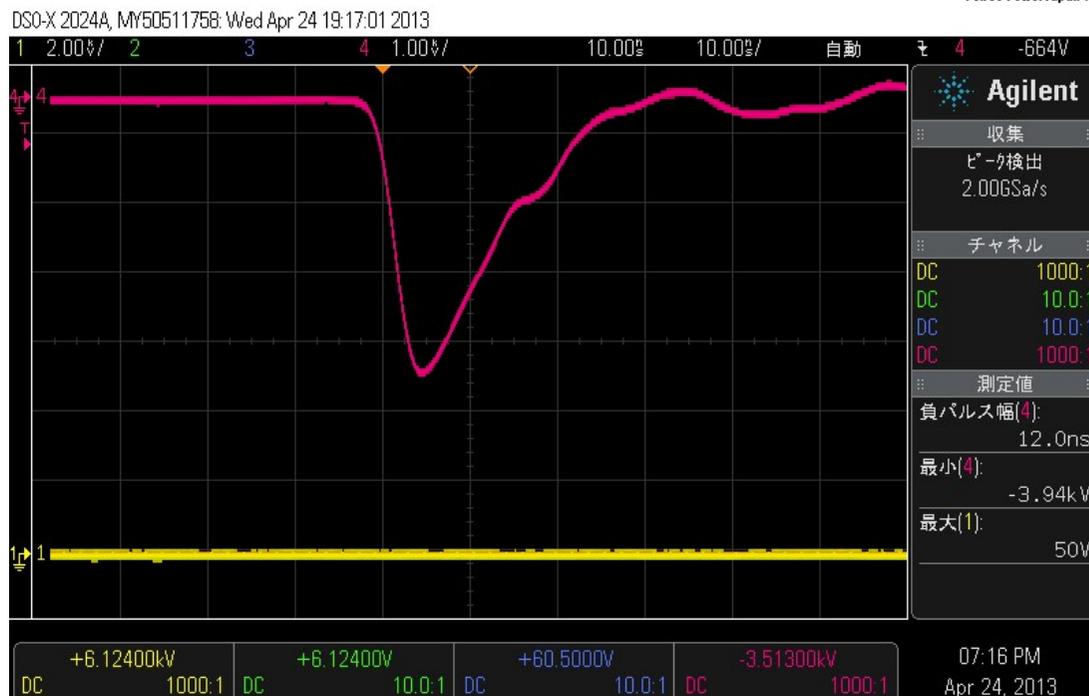
- HV pulsed power supply unit and Pulse transformer unit for Induction voltage adder



Output Voltage 20kV/div 200ns/div

No.4

Solid-state nano-second HV Pulser

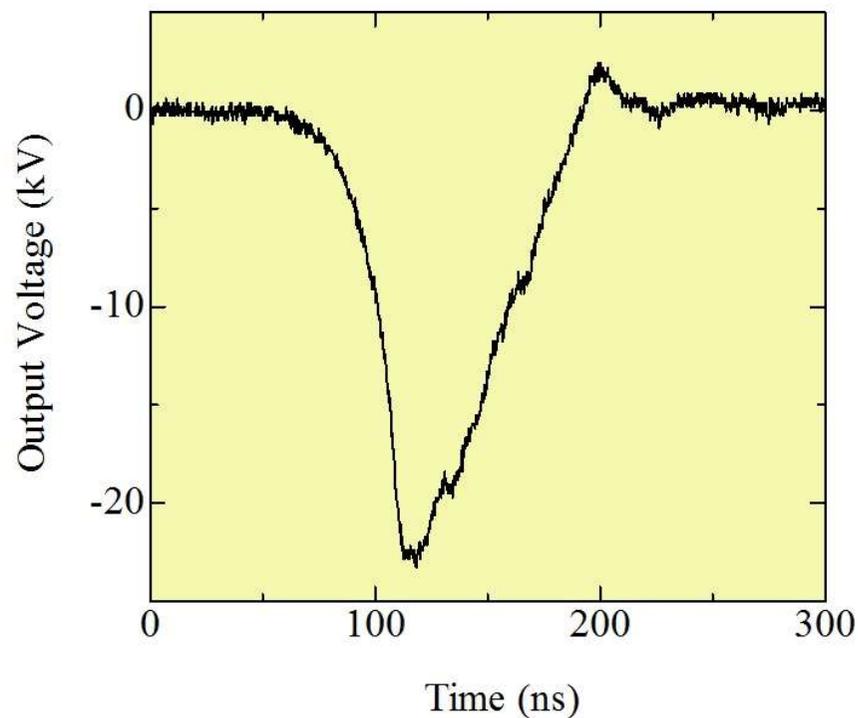


CH4 (R) Output voltage 1kV/div 4kVp
10ns/div

Output Voltage -4kVp
Output Current 80Ap
Pulse Width 10ns
Rise Time 4ns
Repetition 20kHz

応用例	
材料分析用	材料分析用

High Voltage SOS Pulse Generator for Streamer Discharge



Output Voltage -30kVp
 Output Current 30Ap
 Pulse Width 50ns
 Rise Time 20ns
 Repetition 1kHz
 Input DC24V, 10A
 Weight 16.5kg

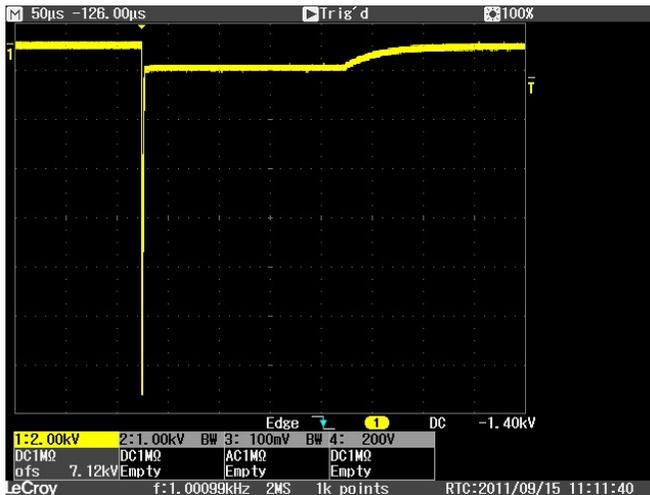
応用例	
排ガス処理	废气排放处理
排水処理	污水处理
エンジン燃焼促進	发动机燃烧促进

No.6

High Voltage Pulse Power Supply for Plasma Generation



Output Voltage(for ignition)	-20kVp
Output Voltage(for keeping)	-1kV
Output Current	1Ap
Pulse Width(for ignition)	100ns
Pulse Width(for keeping)	10 μ s ~ 1ms
Repetition	100Hz ~ 10kHz (duty < 10%)



Output Voltage 2kV/div,

50 μ s/div

応用例

プラズマ生成用

等 離 子 生 成 用

No.7

High Voltage Pulse Generator for Plasma CVD



Output Voltage	-3kVp
Output Current)	6Ap
Pulse Width	15 μ s
Repetition	2kHz

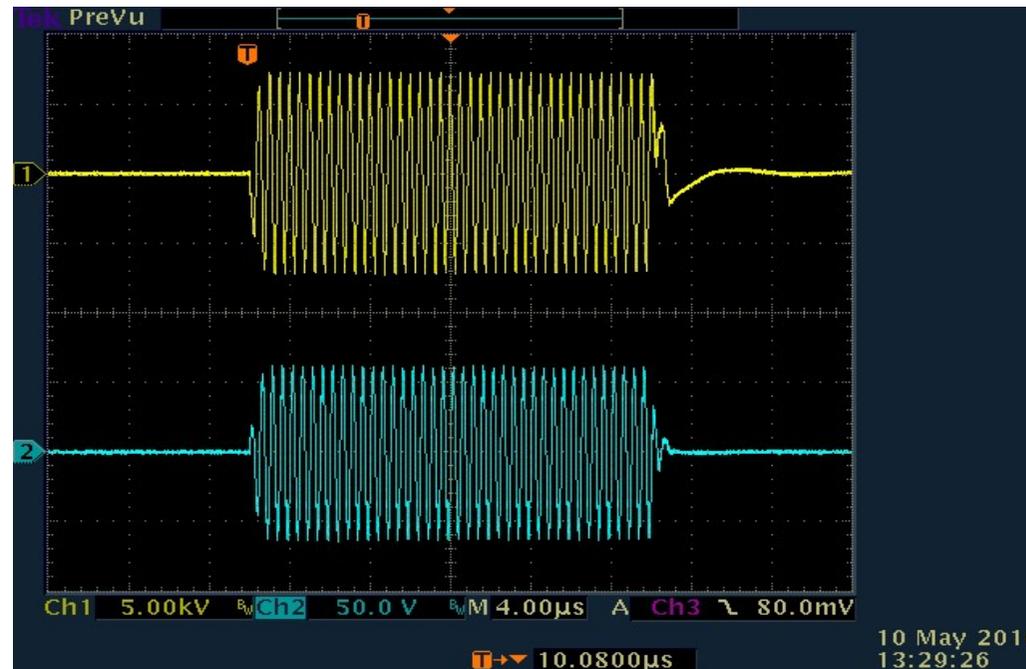
応用例	
プラズマCVD用	等離子CVD用



CH4 (B) Output Current 2A/div

No.8

High-Voltage HF Power Supply



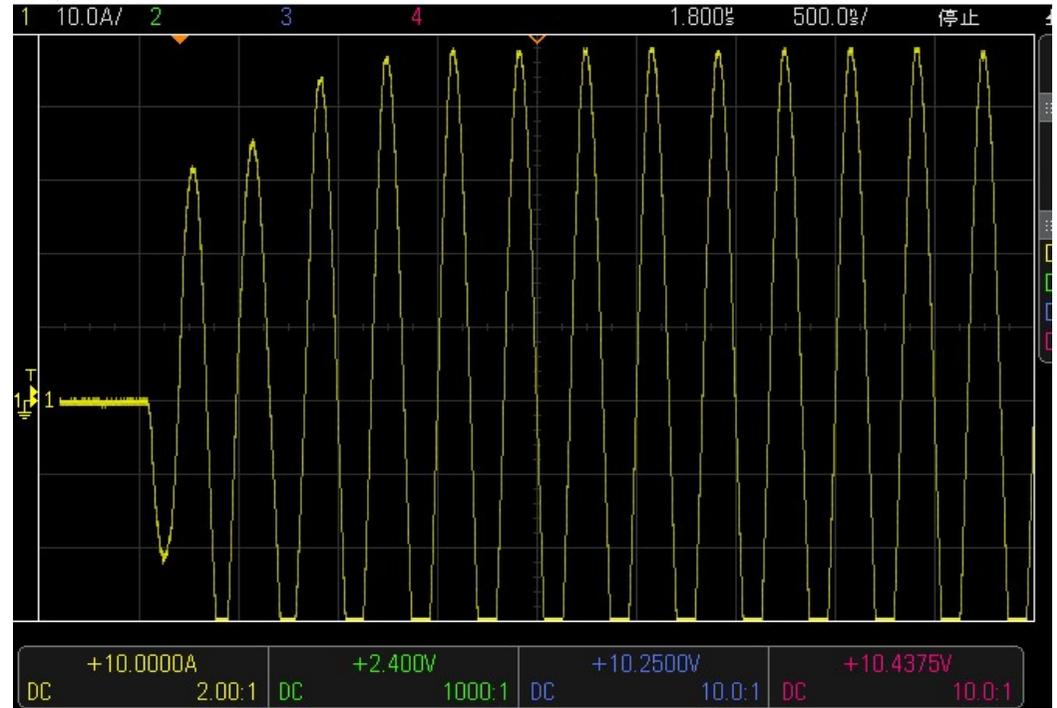
Output Voltage $\pm 6\text{kVp}$
Output Current $\pm 60\text{Ap}$
Frequency 2MHz
Duty (Max.) 5%
Burst width (Max.) 100 μ s

CH1 (Y) : Output Voltage 5kV/div $\pm 7\text{kVp}$
CH2 (B) : Output Current 50A/div $\pm 65\text{Ap}$
4 μ s/div

応用例	
ガスレーザー用	気体激光用

No.9

Large-Current HF Power Supply

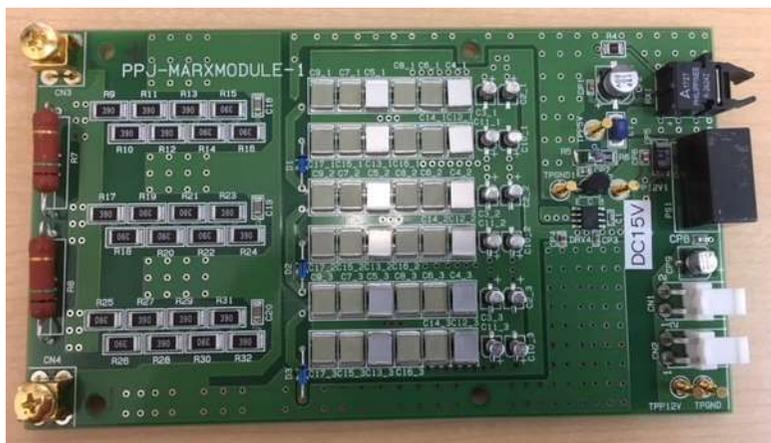


Output Voltage ±500V
Output Current ±400A
Frequency 3MHz
Duty (Max.) 5%

CH1 (Y) : Output Current 80A/div ±390Ap
500ns/div

応用例	
加速器用	加速器用
電磁石励磁用	电磁铁励磁用

High repetitive MARX switch

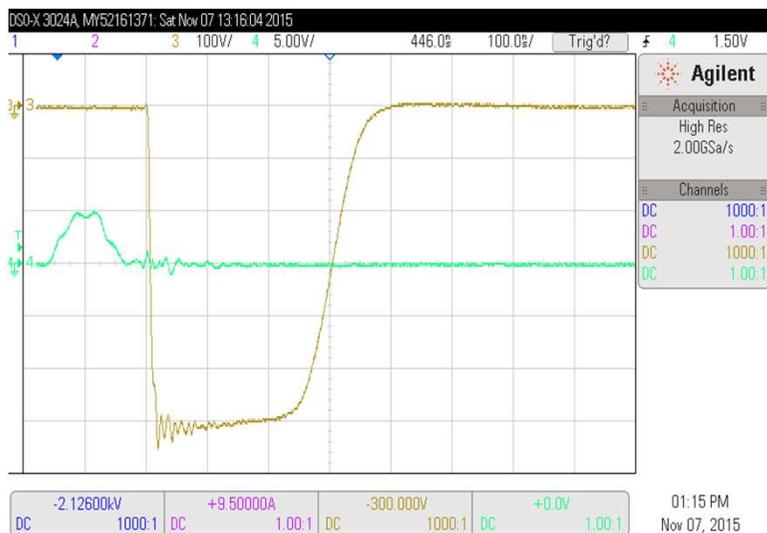


Output voltage	600V
Output current	40A
Pulse width	200ns
	(Variable with external input trigger pulse width)
Rise time	7.6ns
Pulse repetition	400kHz
Semiconductor switch	MOS-FET
Operating temperature limit	0-40°C
Switching trigger input signal	Optical trigger

応用例

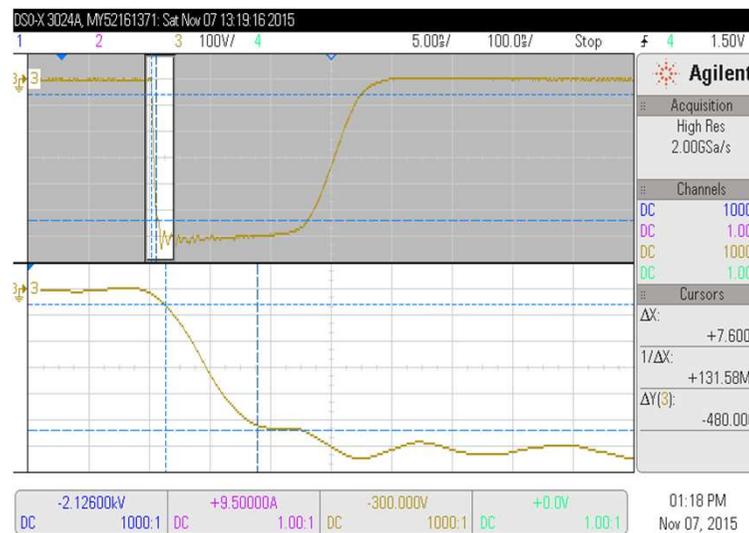
超高速パルス発生用

超高速脉冲发生用



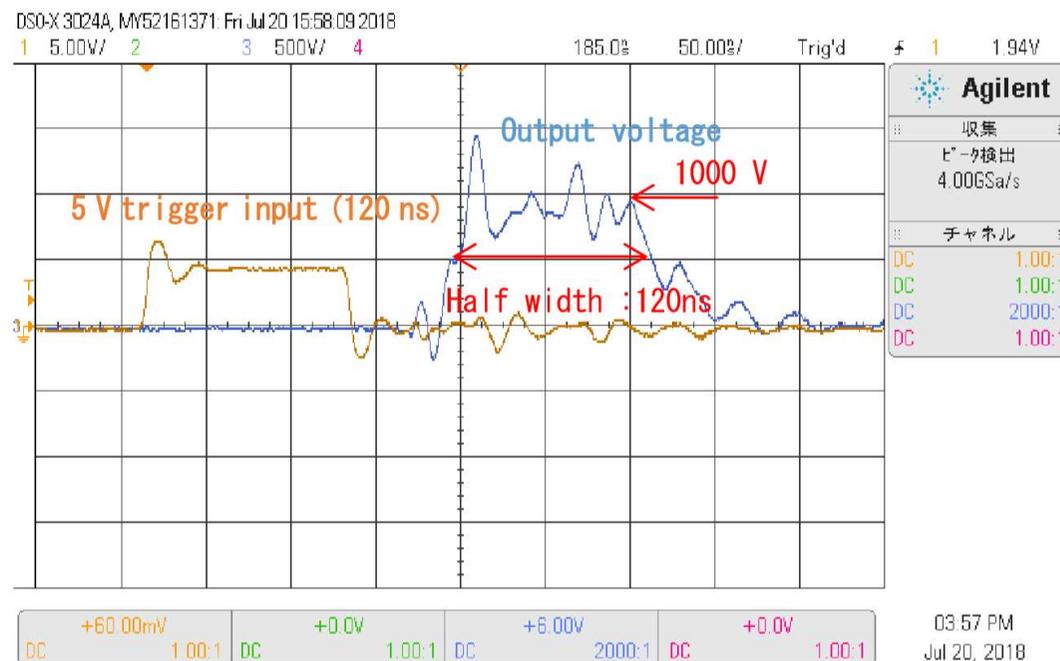
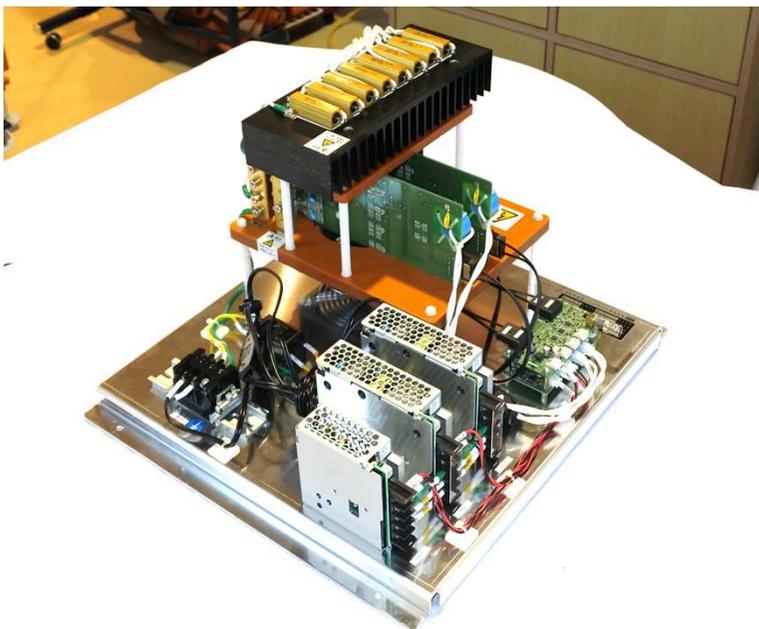
CH3 (Y) ; Output Voltage -600Vp 100V/div

CH4 (G) ; TRG input signal 5V/div



Rise time (10%–90%) 7.6ns 5ns/div

High repetition HV switch

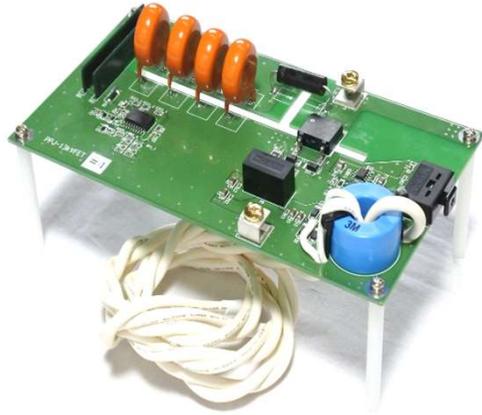


Pulse voltage generation with voltage 1 kV, pulse width 120 ns, repetition 100 kHz

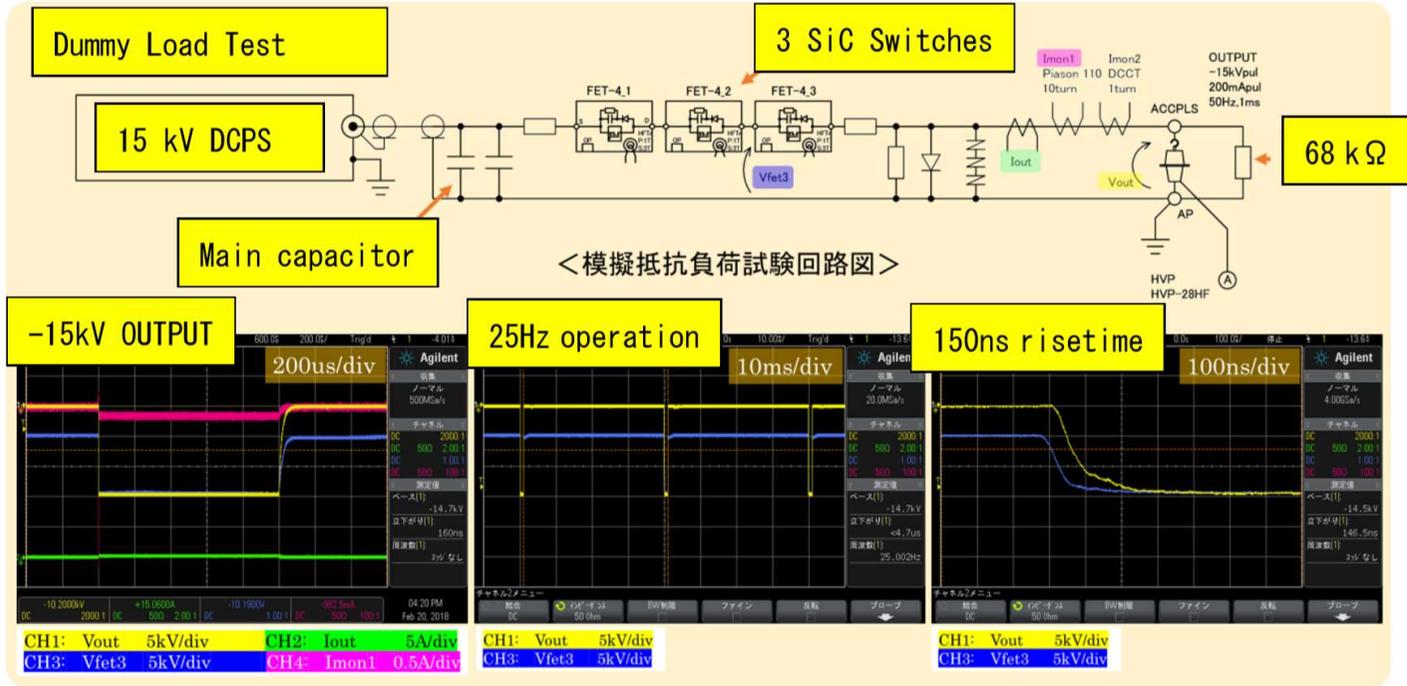
Maximum Output Voltage	1kV
Maximum Output Current	10A
Pulse Width	60ns~100ns
	(Variable with external input trigger pulse width)
Maximum Pulse Repetition	100kHz
Maximum DC input voltage	DC1kV
Receiving electricity	AC100V Single-phase
Size	390mm × 430mm × H240mm

応用例	
材料開発	材料开发
材料試験用	材料试验用

10kV SiC-MOSFET switch



Rated Voltage 10kV
 Rated Current 200mA
 Pulse Width 100us ~ 1ms
 Repetition 50Hz
 Trigger input 5V (50Ω)
 Main device **10kV SiC-MOSFET**



3枚应用例

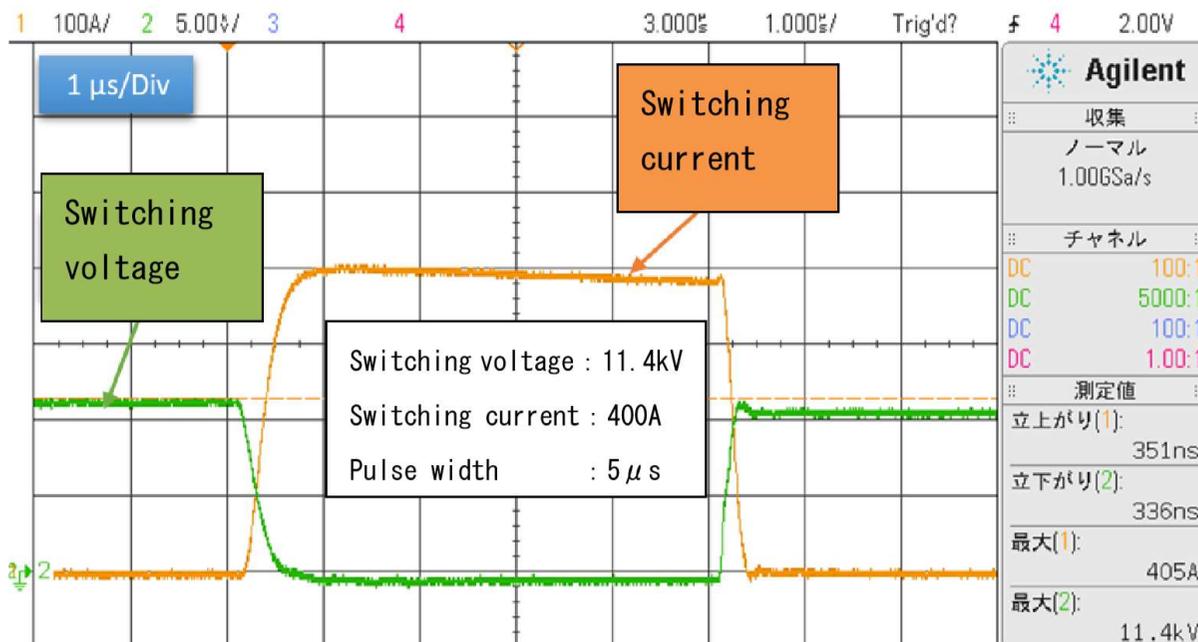
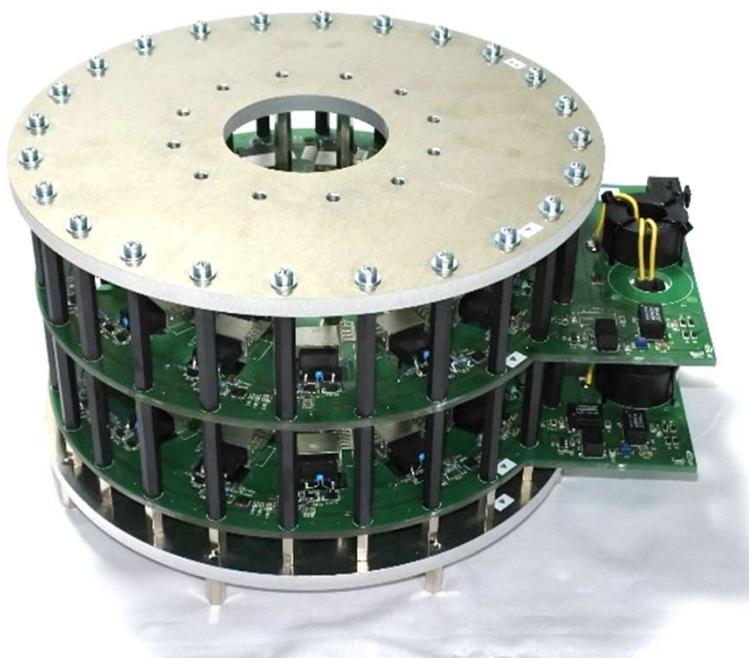


応用例	
加速器用	加速器用

輸出禁止対象
 代替品対応可

No.13

High voltage semiconductor switch



Rated Voltage 20 kV
 Rated Current 500 A
 Main device **10kV SiC-MOSFET (12P2S)**
 Size 300mm x 250mm x 150mm

応用例	
加速器用	加速器用
静電キッカー-電磁石用	静电冲击(kicker) 电磁铁用

輸出禁止対象
 代替品対応可

MOS-gate thyristor module



Output Voltage 6kV
 Pulse Current 5kAp
 Pulse Width $2\mu\text{s}$
 Turn-on time 20ns
 Repetition 200Hz



CH1 (Y) : PFN Output Voltage -3kV 1kV/div. 6kV charging 200pps

CH4 (G) : PFN Output current -870A 200A/div.

CH2 (M) : MOSTHY A-K Voltage 1kV 500V/div.

5 $\mu\text{s}/\text{div}$

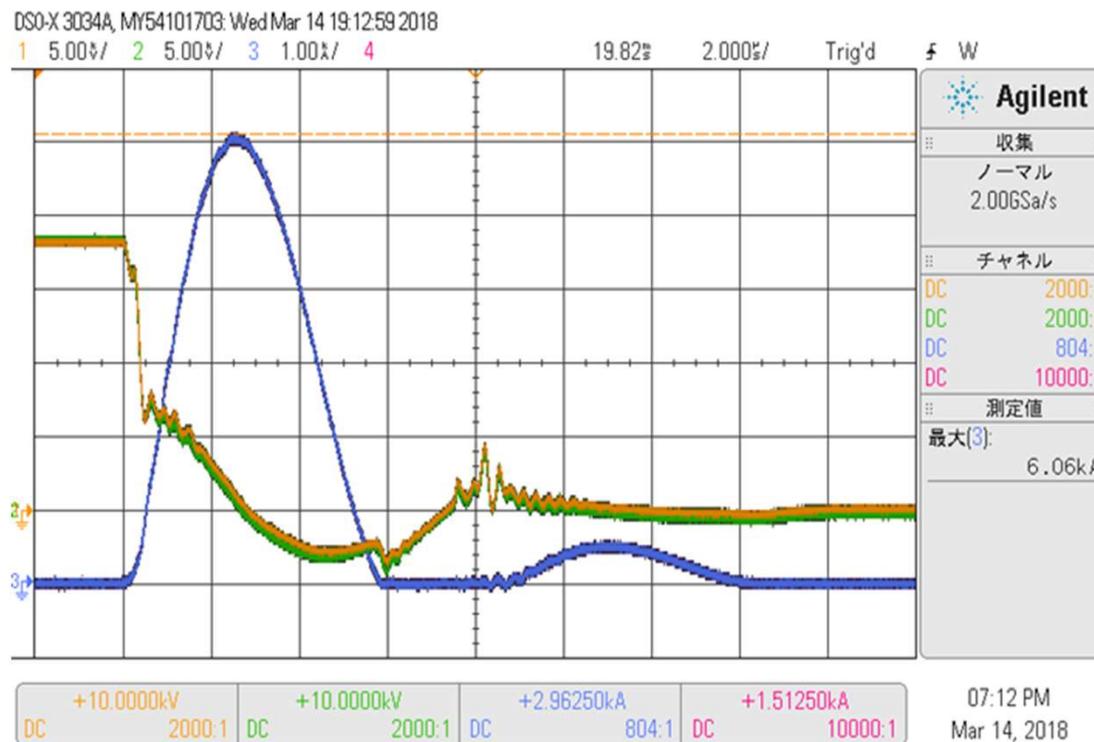
応用例

応用例	
加速器用	加速器用
サイラトロン代替	替代 闸流管 (thyatron)
イグナイトロン代替	替代 引燃管 (Ignitron)

MOS gate thyristor unit

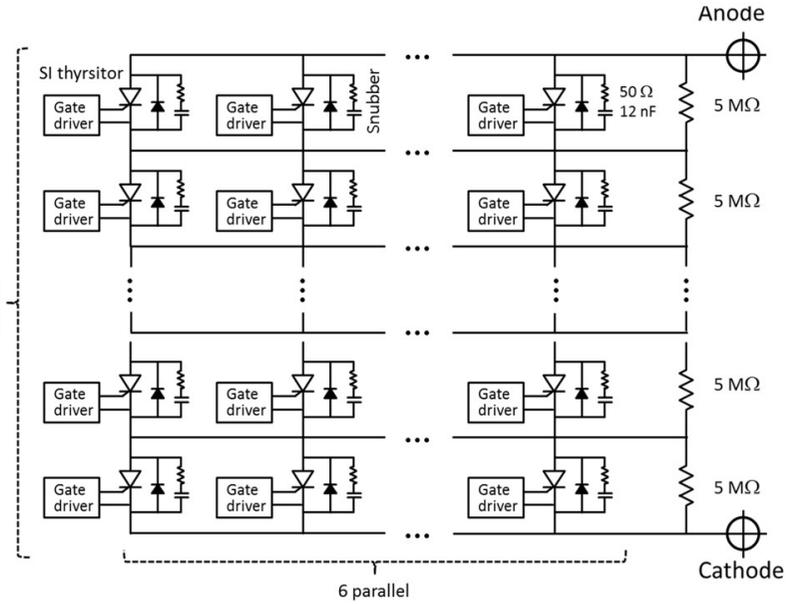
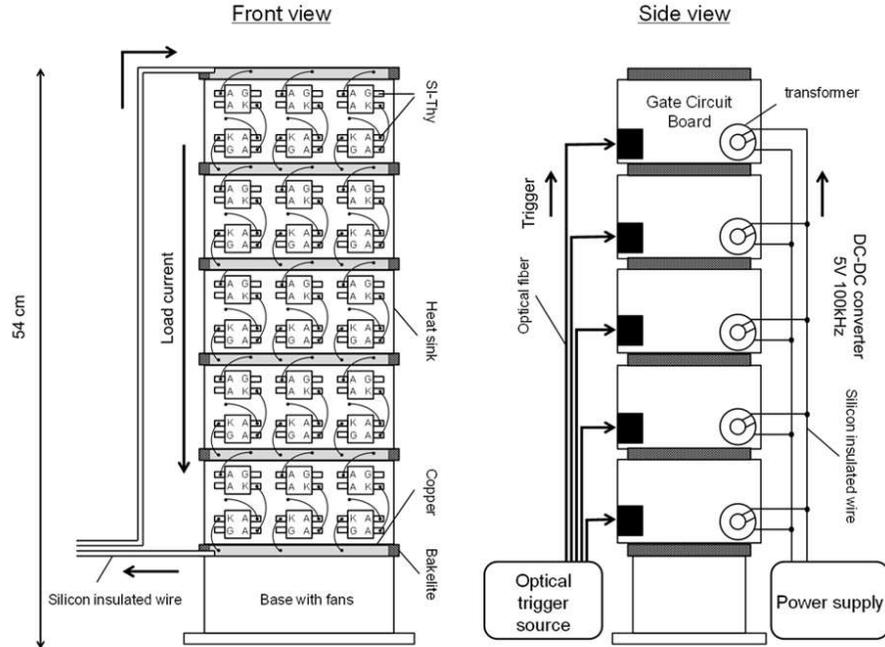


Rated Voltage 25kV
 Rated Current 6kA
 Pulse Width 8 μ s
 Repetition 50Hz
 Main device MOS-gate THY
 Size 430mmX450mmX612mm (H)



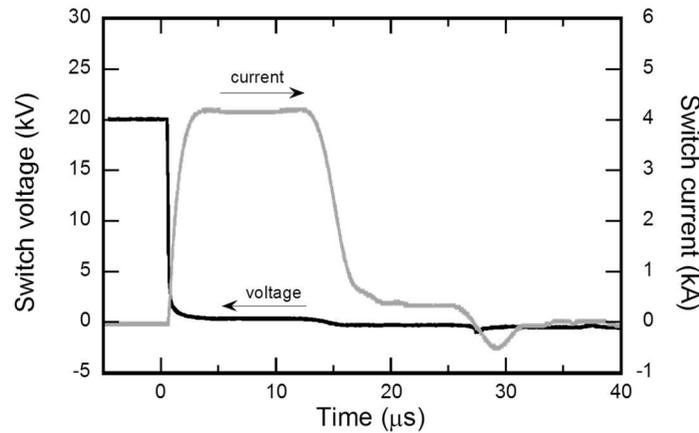
応用例	
加速器用	加速器用
サイラトロン代替	替代 闸流管 (thyatron)

Solid-state Switch(SI-SCR) replaceable with thyatron



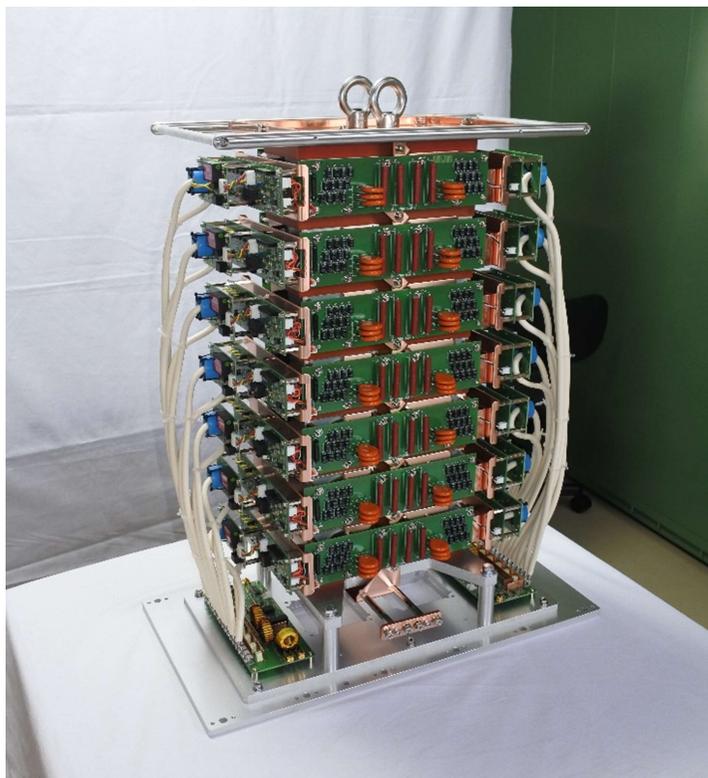
30cm(W) × 15cm(D) × 54cm(H)

Charging Voltage 25kVp
 Output Current 6kp
 Pulse Width 10 μs
 Repetition 10Hz



応用例	
加速器用	加速器用
サイラトロン代替	替代 闸流管 (thyatron)

Semiconductor HV switch replaceable with thyatron



Rated Voltage DC 50kV
 Pulse Current 5kAp (pulse width 5 μs)
 Pulse repetition 60pps
 Main device Thyristor
 Size H700mm*W440mm*D240mm

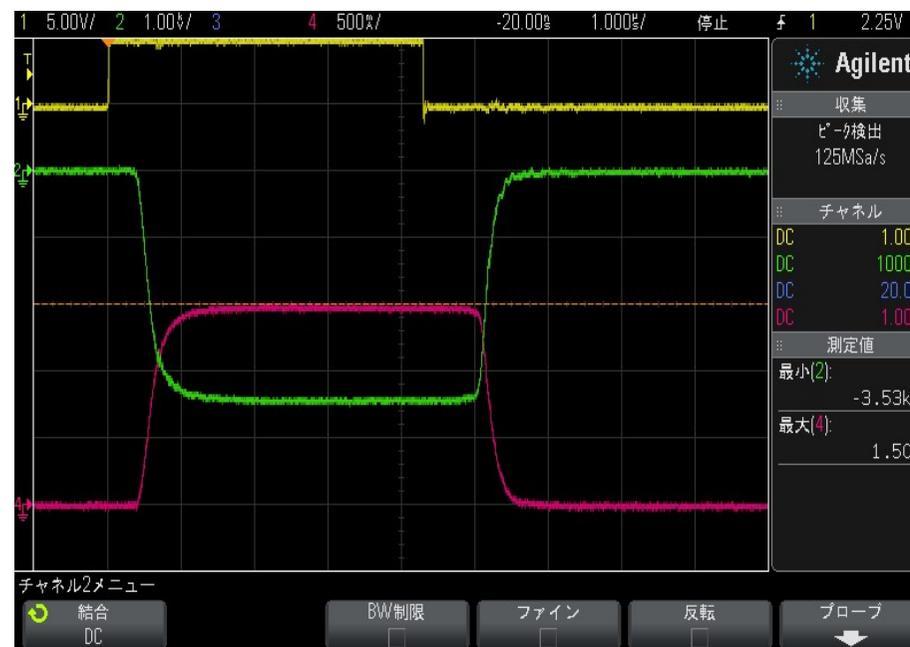
応用例	
加速器用	加速器用
サイラトロン代替	替代 闸流管 (thyatron)

HV Pulse Generator for Magnetron



Output Voltage -38.5kVp
 Output Current 100Ap
 Pulse Width 4.2 μ s
 Repetition 250Hz

応用例	
加速器用	加速器用
医療用・非破壊検査用	医療用，非破壊検測用
マグネトロン駆動用	磁控管（magnetron）駆動用



CH1 (Y) :Ext. Trigger 5V/div

CH2 (G) :Output Voltage(primary of PT) 1kV/div 3.5kVp

CH4 (R) :OutputCurrent(primary of PT) 400A/div 1.2kAp

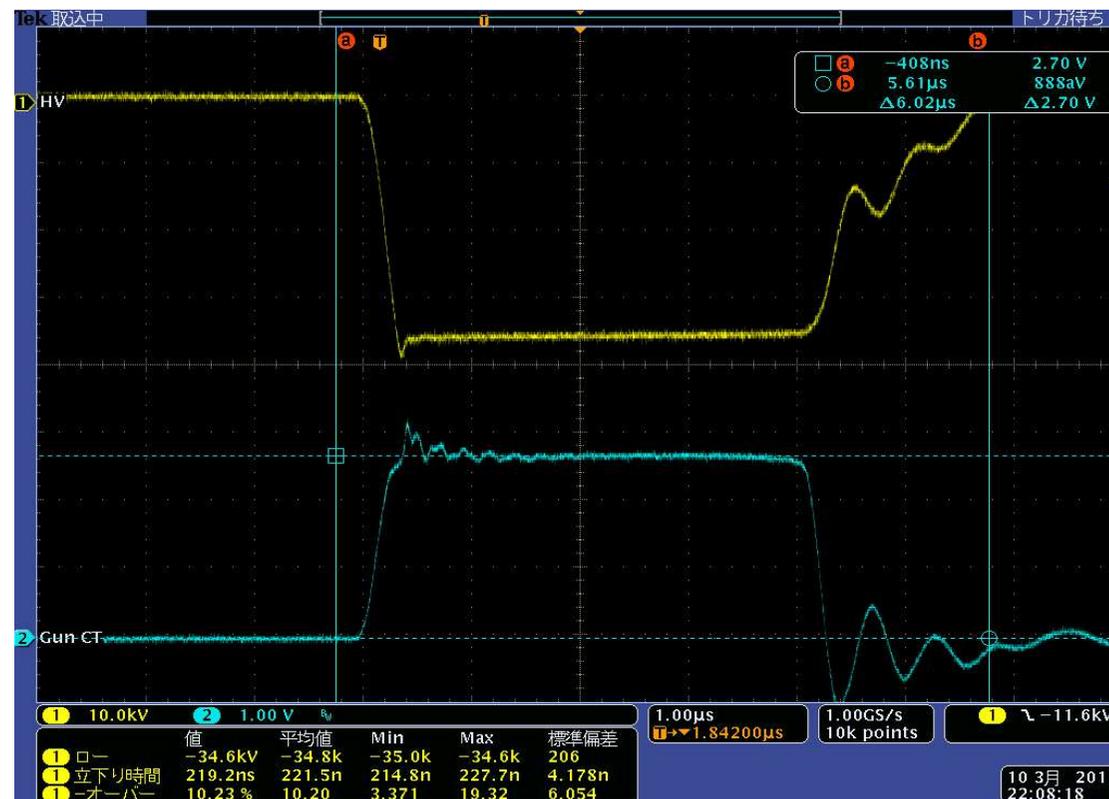
1 μ s/div

Portable HV Pulse Generator for Magnetron



Output Voltage -40kVp
 Output Current 40Ap
 Pulse Width 4.5 μ s
 Repetition 250Hz

Higher power is available by parallel operation.



CH1 (Y) : Magnetron Voltage 37kVp

CH2 (B) : Magnetron Current 54Ap

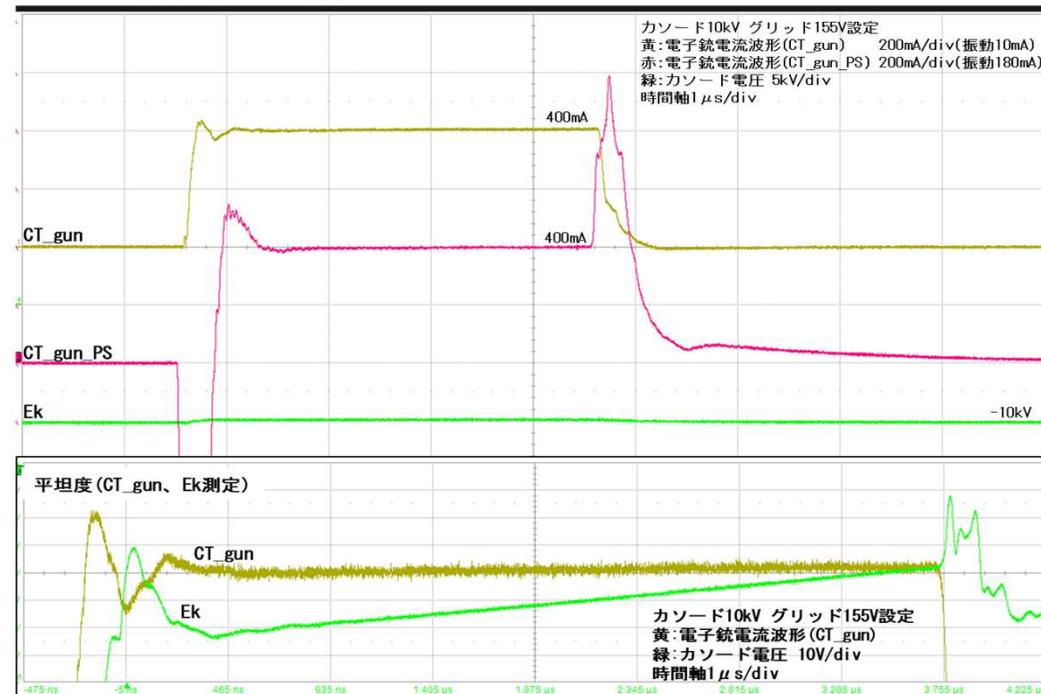
Flat-top Width of Magnetron Current: 3.7 μ s

応用例	
加速器用	加速器用
医療用	医療用
マグネトロン駆動用	磁控管(magnetron)駆動用

Power supply for triode electron gun



カソード電圧/電子銃電流

カソード電圧:10kV グリッド電圧:155V パルス幅:4 μ s

Output Voltage DC-20kV

Output Current 0.7A

Flatness 0.50%以下

Stability 0.20%以下

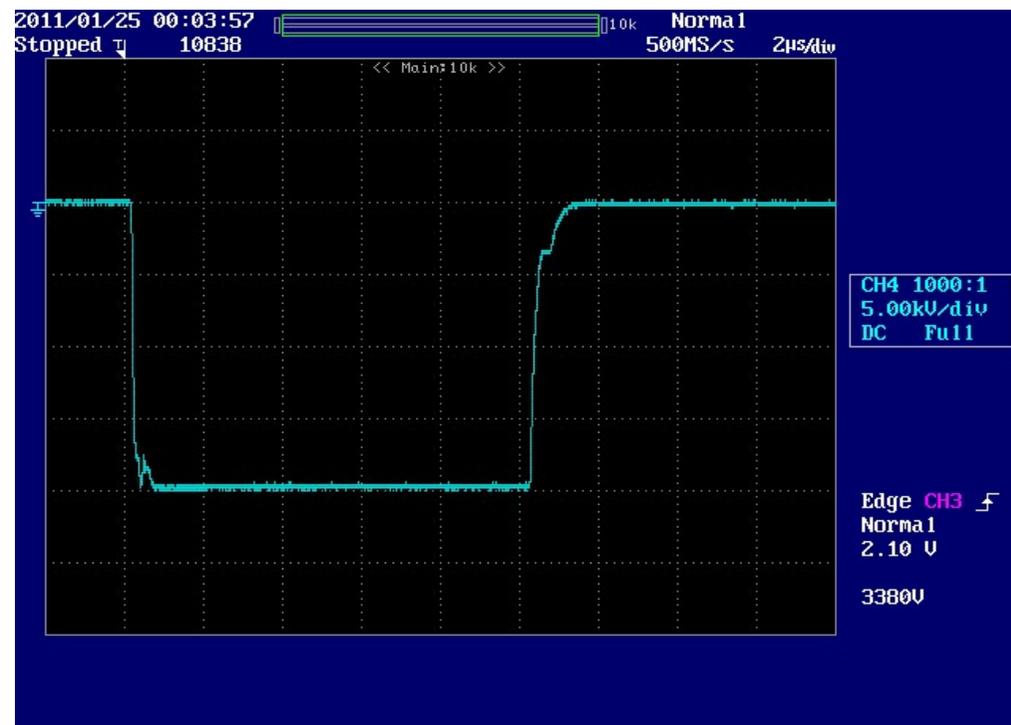
Including grid pulser and heater PS

応用例

加速器用	加速器用
医療用・非破壊検査用	医療用, 非破壊検測用
電子銃用	電子銃(electron gun)用

No.21

Compact Marx-type HV Pulser for E-Gun

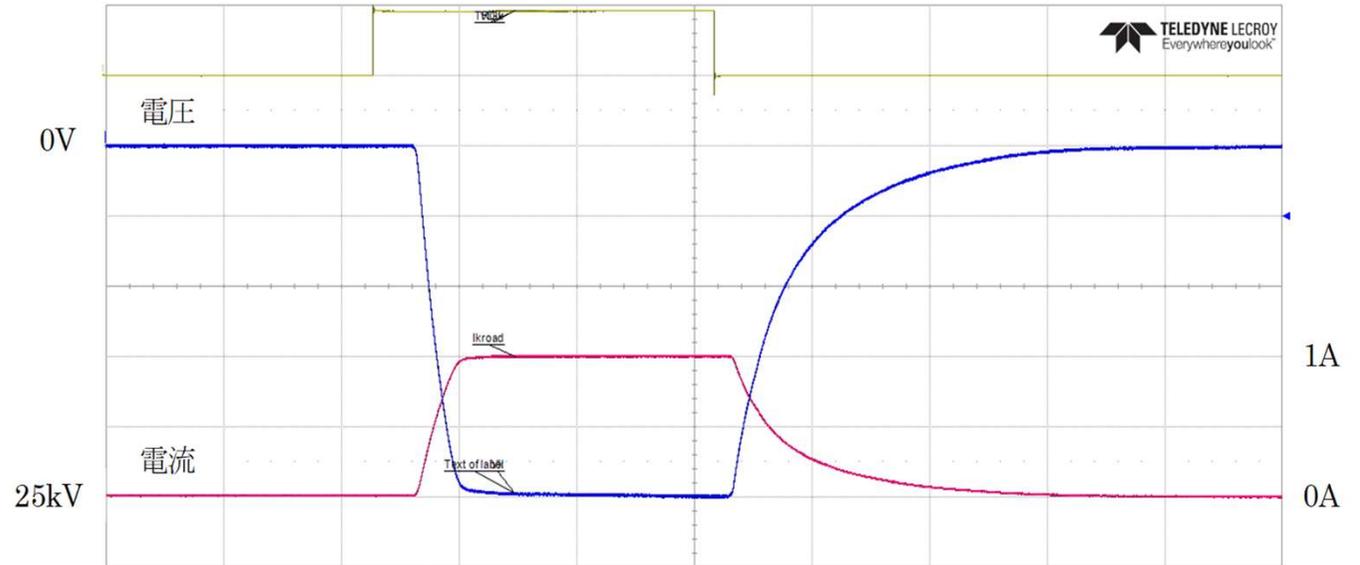


CH4 (B) :Output Voltage 5kV/div 2µs/div

Charging Voltage 3.3kV
 Output Voltage -20kVp
 Output Current 1Ap
 Pulse Width 3.5µs
 Repetition 200Hz
 Size 200mm (W) × 100mm (D) × 241mm (H)
 Weight 2kg

応用例	
加速器用	加速器用
医療用・非破壊検査用	医療用，非破壊検測用
電子銃用	電子銃 (electron gun) 用

Pulsed power supply for electron gun



CH3 (B) : Cathode output voltage waveform 5kV/div 25kV

CH2 (R) : Cathode output current waveform 0.5A/div 1A

Time axis: 2 μ s/div

Output Voltage -25kV

Output Current 1A

Pulse Width 12 μ s

Repetition 100Hz

Including Grid pulser and heater PS

応用例	
加速器用	加速器用
医療用・非破壊検査用	医療用, 非破壊検測用
電子銃用	電子銃 (electron gun) 用

No.23

SiC-MOSFET based MARX generator for electron gun



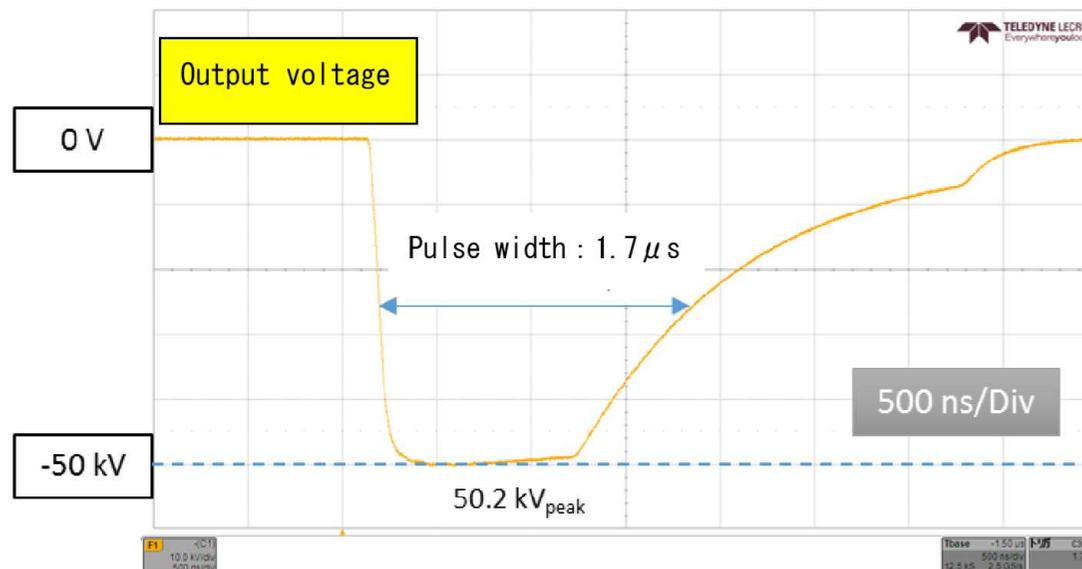
輸出禁止対象
代替品対応可

Charging Voltage -10 kV
Output Voltage -50 kV
Output Current 5 A
Main device 10kV SiC-MOSFET

Pulse Width >1 μ s
Repetition 30 Hz

Size 430mm*290mm*490mm

応用例	
加速器用	加速器用
医療用・非破壊検査用	医療用, 非破壊検測用
電子銃用	电子枪 (electron gun) 用



High frequency power supply



Output Voltage	±530Vp
Output Current	±50Ap
Average Output	10kW
Peak Output	16kW
Oscillation Frequency	40kHz
Receiving Electricity	AC200V、3-phase
Cooling	Water cooling and forced air cooling
Output Control	Constant power
Output power stability	± 5% or less (excluding transient condition)
Approximate size	482mm*683mm*266mm
Digital output control with arc cut function	

応用例	
プラズマ生成用	等イオン発生用
CVD用	CVD用

17.5 Ω load BLINK output (62.5 ms ON – 37.5 ms OFF) 480 V 28.0 A



No.25

High Voltage Pulsed generator for engine ignitor

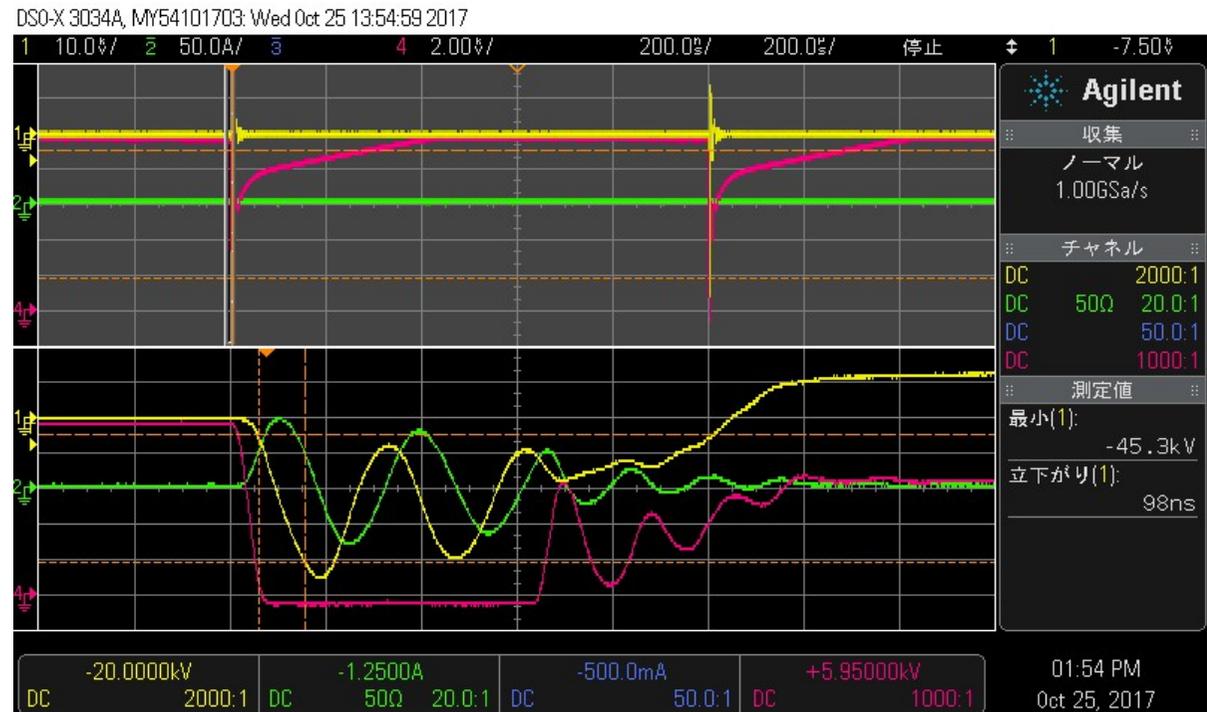


輸出禁止対象
代替品対応可



Output voltage
Maximum voltage rise rate
Pulse energy
Repetition rate
Main Device

-45kVp
100kV/us
20mJ
1kHz
10kV SiC-MOSFET



CH1 (Y) : Output Voltage 10kV/div
CH2 (G) : PTR primary current 50A/div
CH4 (M) : FET Drain voltage 2kV/div
Upper trace: 200us/div Lower trace: 200ns/div

応用例	
排ガス処理	废气排放处理
排水処理	污水处理
エンジン燃焼促進	发动机燃烧促进

Pulsed magnetic property measurement system



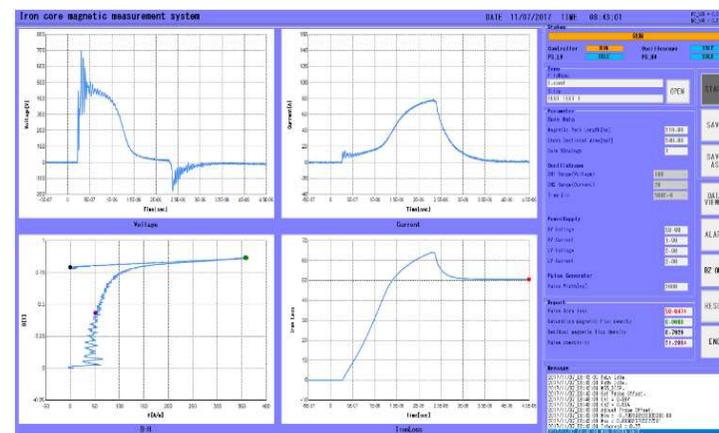
PC control screen

Voltage waveform

Current waveform

B-H curve

Core loss



Charging Voltage	620V
Output Voltage	6kV
Output Current	1kA
Pulse Width	50ns~100us
Repetition	One shot

応用例	
電子部品パルス特性評価用	電子元件脉冲特性评价用
コアパルスBHカーブ測定	磁芯脉冲BH曲线测定

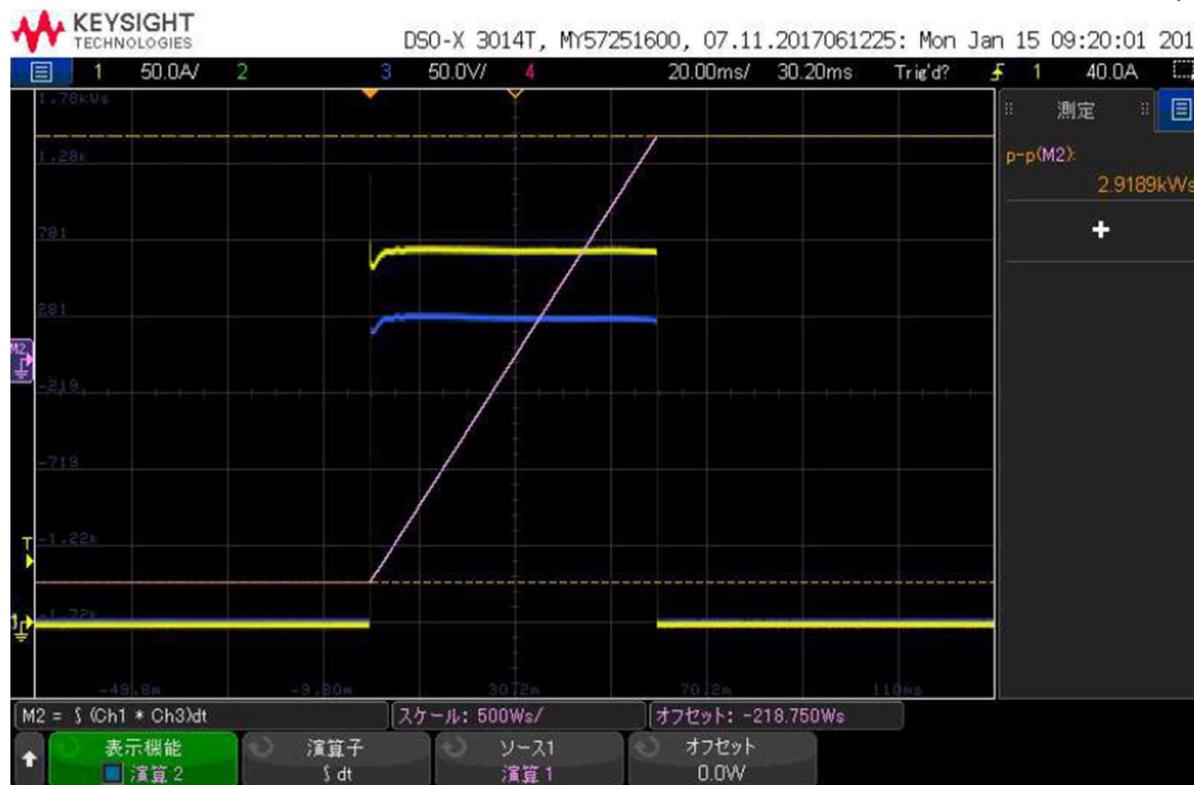


CH3 (Blue) : voltage 1kV/div 6.03kV
 CH4 (Red) : current 200A/div 1020A
 2us/div

Pulsed arc generator



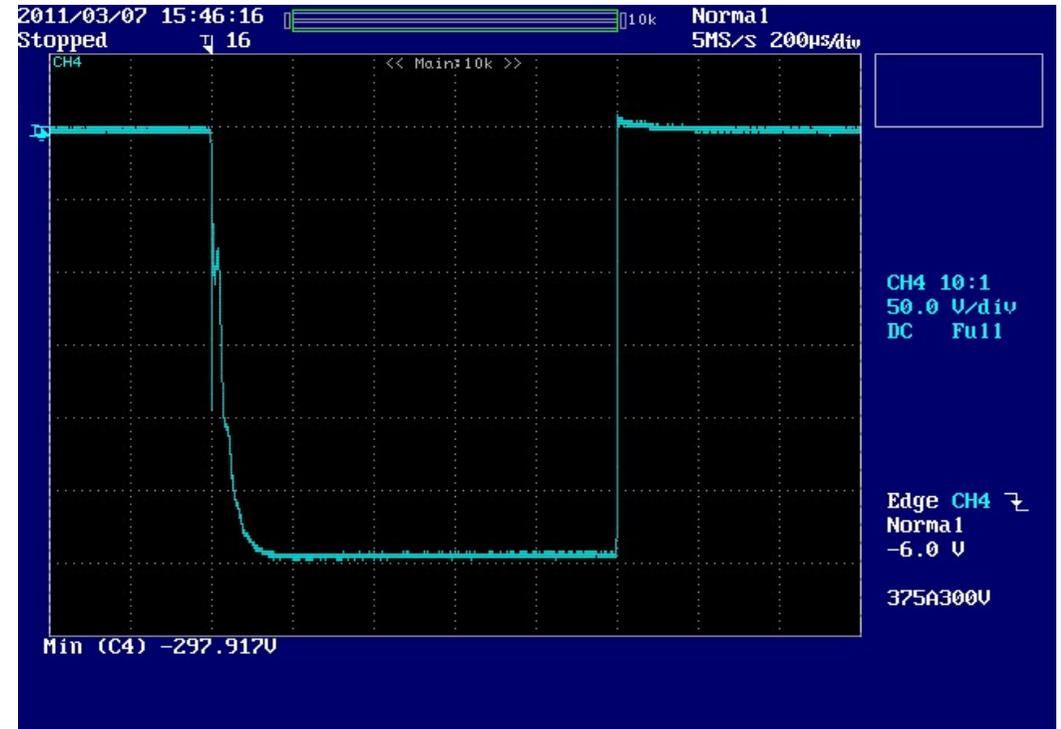
Maximum output voltage	200Vp
Maximum output current	250Ap
Output pulse width	10ms~60ms (Variable in steps of 1ms)
Output current rise time	< 0.5ms (10%—90%)
Output current flatness	< ±5%
Output current stability	< ±5%
Load inductance	< 10 μH



CH1 (Y): Output current 50A/div.
CH3 (B): Output voltage 50V/div.
MATH2 (M): Cumulative energy 500J/div.
20ms/div.

応用例	
プラズマ生成用	等离子发生用
アーク放電用	电弧(arc)放電用

Hybrid Pulse Arc Power Supply for Ion Source with LaB6 Filament



Output Voltage 300Vp
 Output Current 400Ap
 Pulse Width 1ms
 Repetition 50Hz

Output Current 50A/div
 200 µs/div

応用例	
加速器用	加速器用
イオンビーム発生用	离子束 (ion beam) 発生用

No.29

Power Supply for Beam distribution kicker magnet



- Output voltage $\pm 300\text{Vp}$
- Output current $\pm 100\text{Ap}$
- Average output 10kW Continuous
- Load 100mH , 1 Ω
- Output control Constant current control /
Constant magnetic field control
- Output current stability < 0.1% Excluding transient conditions
- Current switching ratio 10Hz
- External control LAN



Blue : Output Current 10A/div.
 Red : Gaussmeter waveform 200mT/div.
 Time axis : 200ms/div.

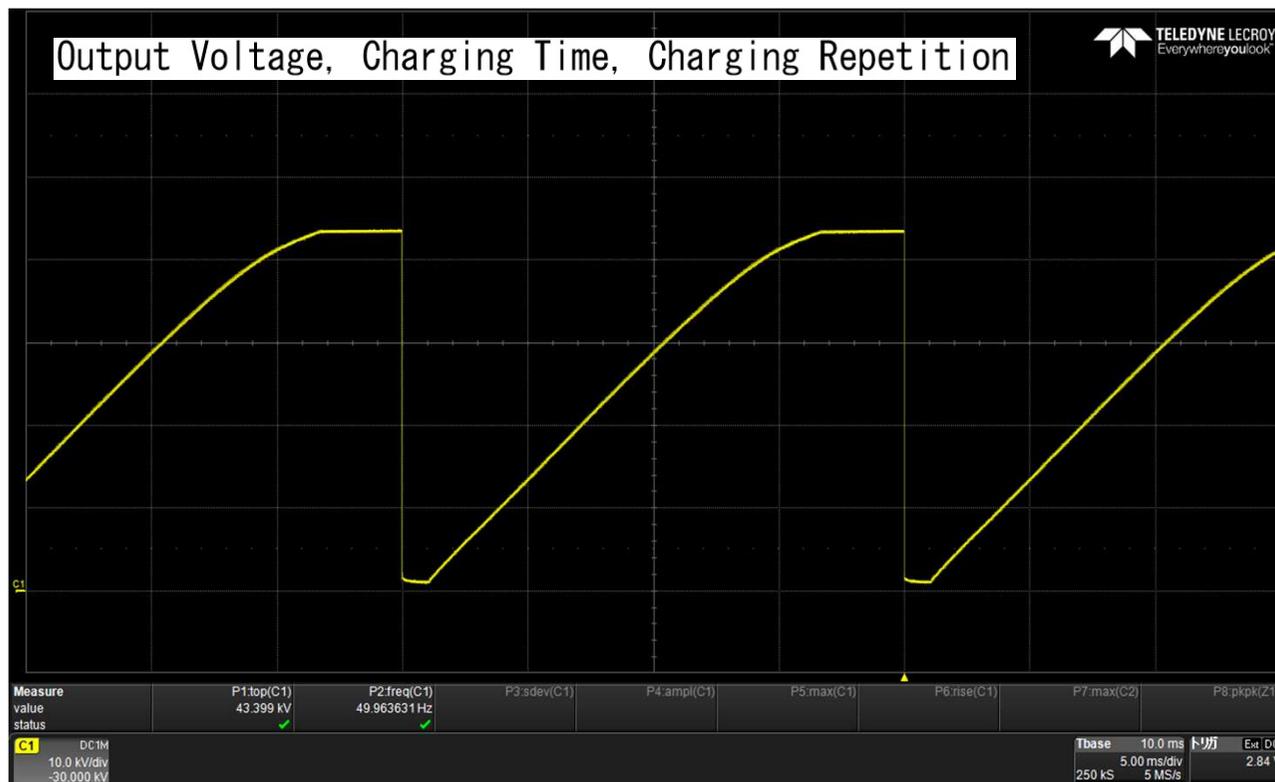
応用例	
加速器用	加速器用
ビーム振り分けキッカー用	束流 (beam) 分離Kicker電磁鉄用

Capacitor charger for klystron modulator



Receiving Electricity 3 ϕ AC420V
 Charging Voltage 43kV
 Charging Current 1.5A
 Charging Time 18ms
 Load capacitance 0.62 μ F
 Repetition 50pps
 Stability <0.1%

With keeping function of charging voltage



CH3: Charging voltage 10kV/div 43kV

Charging Time 16ms

応用例	
加速器用	加速器用
コンデンサ充電用	电容充电用
クライストロン変調器用	速调管(klystron)调制器用

No.31

Capacitor charger

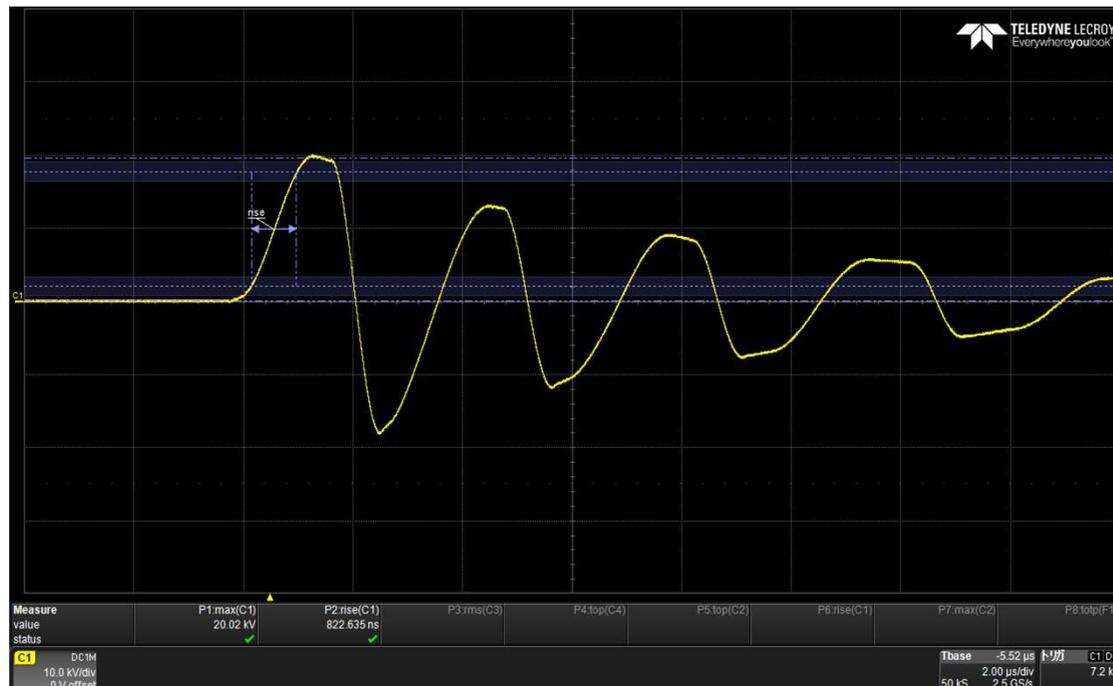


Receiving Electricity 3 φ AC200V
 Charging Voltage +20kV
 Charging Current 0.5A
 Charging time 80 ms
 Load capacitor 2μF
 Repetition 10Hz

CH1 (Y) : CHARGE GATE 5V/div
 CH3 (B) : Charging voltage 5kV/div 20kV
 CH4 (M) : Inverter output current 100A/div
 5ms/div charging time 21ms
 (Load capacitance 0.6μF)

応用例	
加速器用	加速器用
コンデンサ充電用	电容充電用

Rapid Capacitor charger



Load Capacity 12.6nF
 Charging Voltage 20kVp
 Charging Time 1 μ s
 Repetition 120Hz

Output Voltage 10kV/div
 2 μ s/div

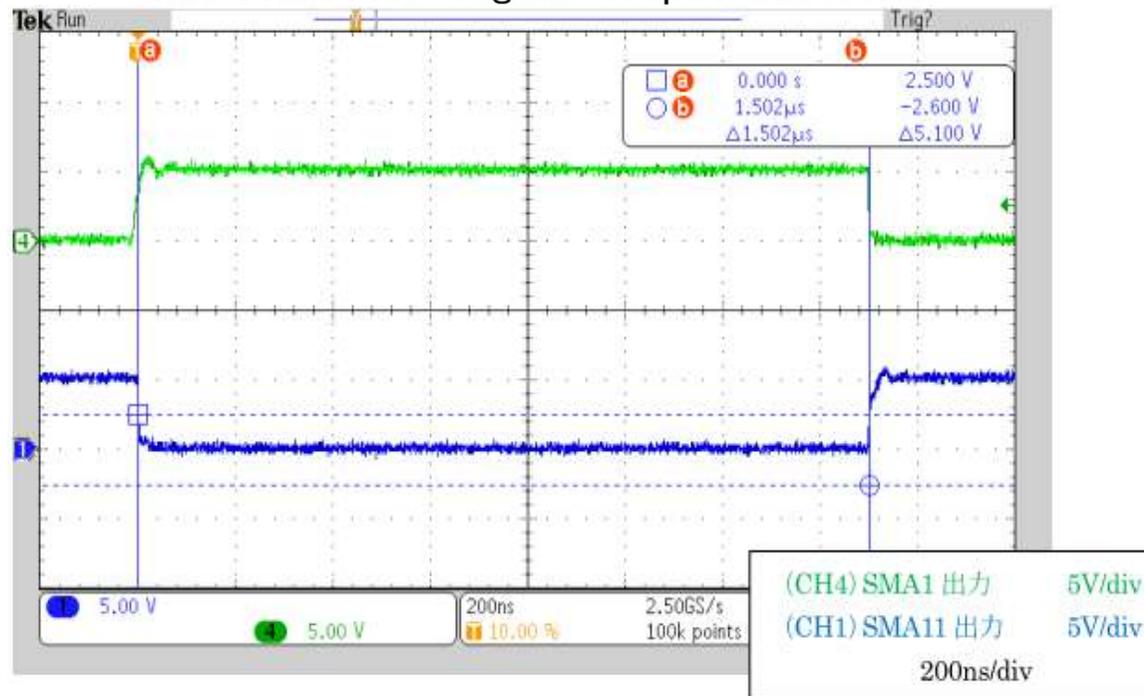
応用例	
排水処理用	汚水処理用
コンデンサ高速充電	电容高速充電用

Multi-channel Gate signal generator



Power-supply voltage	AC100V
Input connector	BNC (2 places)
Output connector	SMA (20ch) 、Optical output (20ch)
Input / output	50Ω (BNC, SMA)
Pulse width setting range	10ns~10μs
Pulse width adjustment resolution	10ns
Pulse setting method	Set by personal computer thru LAN connection
Master trigger	External input trigger
Size	483mm × 470mm × 298mm (H)

SMA connector signal output waveform



応用例	
加速器用	加速器用
LTD用多チャンネルゲート発生	LTD用 多channel gate発生

高性能脉冲功率电源产品 (PPJ) 代理销售及服务

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