

Phase-out/Discontinued

**N-CHANNEL POWER MOS FET ARRAY
SWITCHING TYPE**

DESCRIPTION

The μPA1556 is N-channel Power MOS FET Array that built in 4 circuits designed for solenoid, motor and lamp driver.

FEATURES

- 4 V driving is possible
- Large Current and Low On-state Resistance
 $I_{D(pulse)} = \pm 20$ A
 $R_{DS(on)} = 0.20 \Omega$ TYP. ($V_{GS} = 10$ V)
 $R_{DS(on)} = 0.25 \Omega$ TYP. ($V_{GS} = 4$ V)
- 2.54 mm Pitch (0.1 inch)

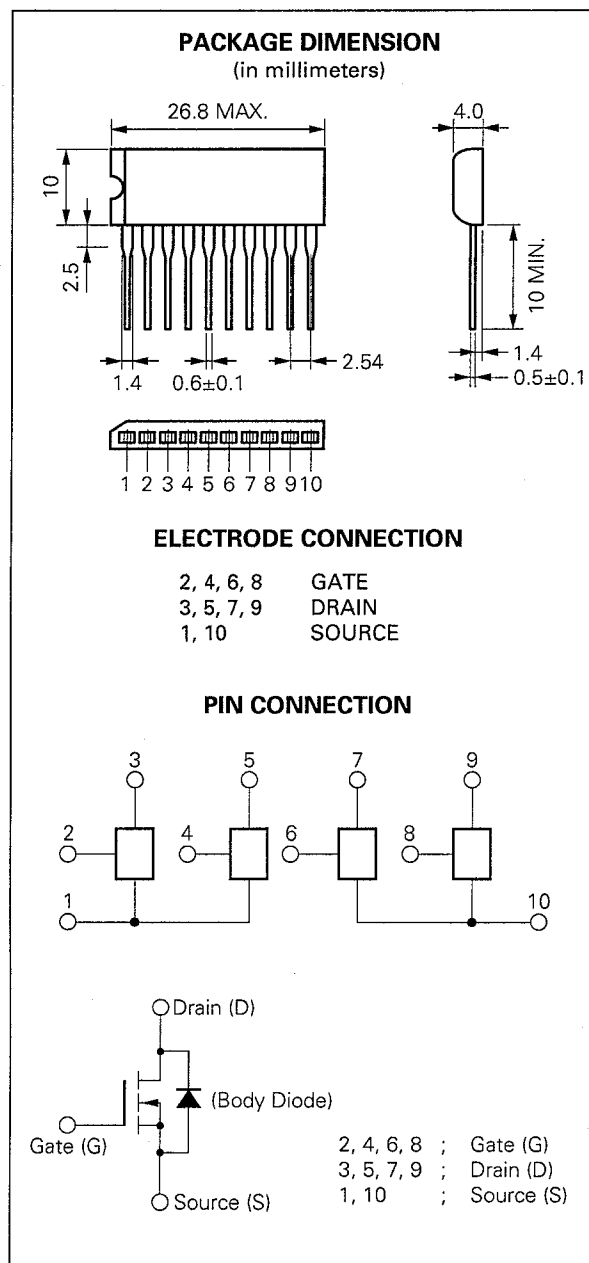
ORDERING INFORMATION

Part Number	Package	Quality Grade
μPA1556H	10 Pin SIP	Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEL-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

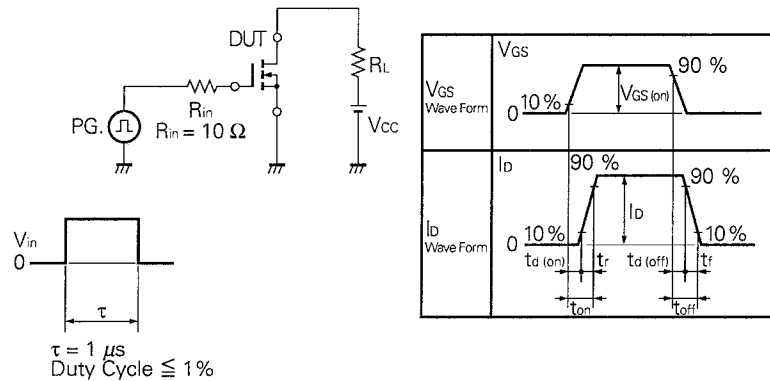
Drain to Source Voltage	V_{DSS}	100	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 5.0	A/unit
Drain Current (pulse)	$I_{D(pulse)}$	± 20	A/unit
Total Power Dissipation (4 circuits)			
$\langle T_c = 25^\circ\text{C} \rangle$	PT_1	28	W
Total Power Dissipation (4 circuits)			
$\langle T_a = 25^\circ\text{C} \rangle$	PT_2	3.5	W
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Junction Temperature	T_j	150	$^\circ\text{C}$
$PW \leq 300 \mu\text{s}$, Duty Cycle $\leq 10\%$			



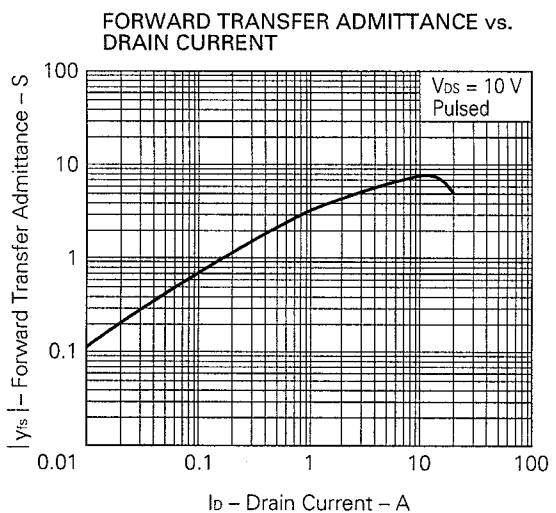
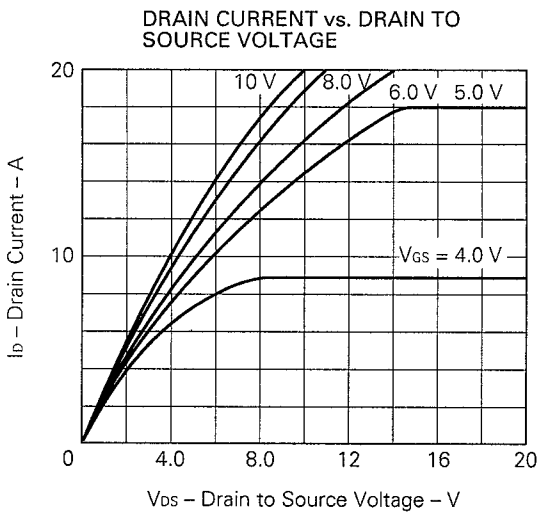
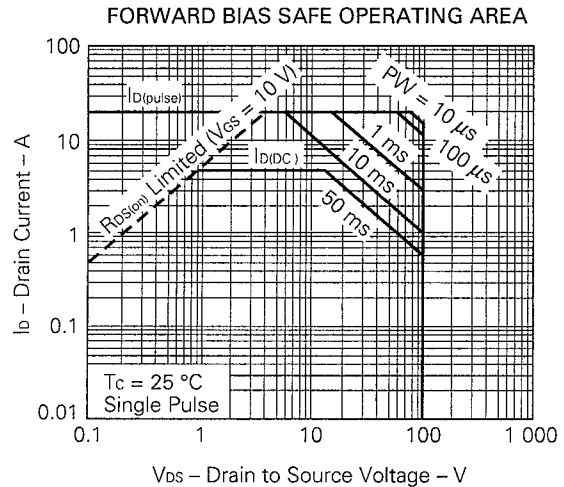
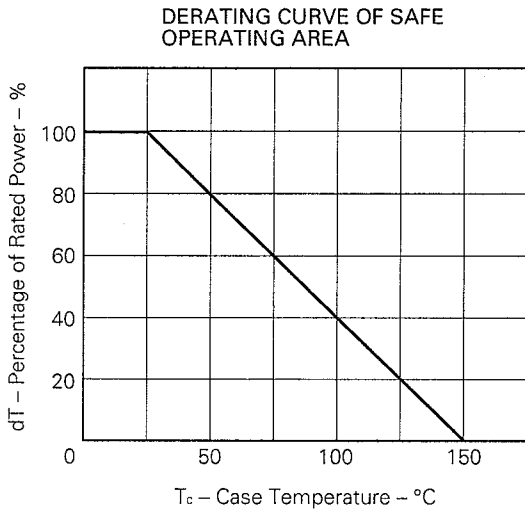
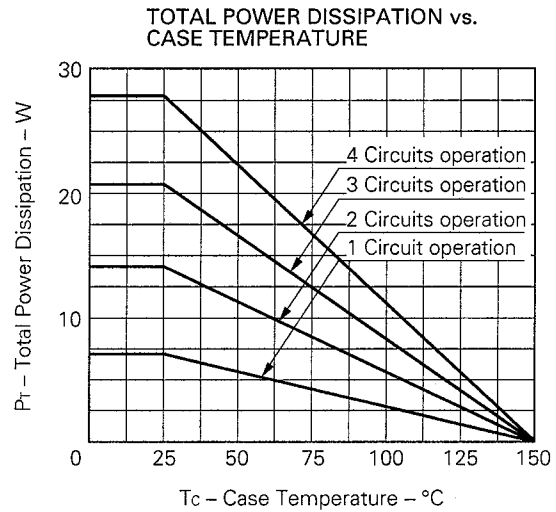
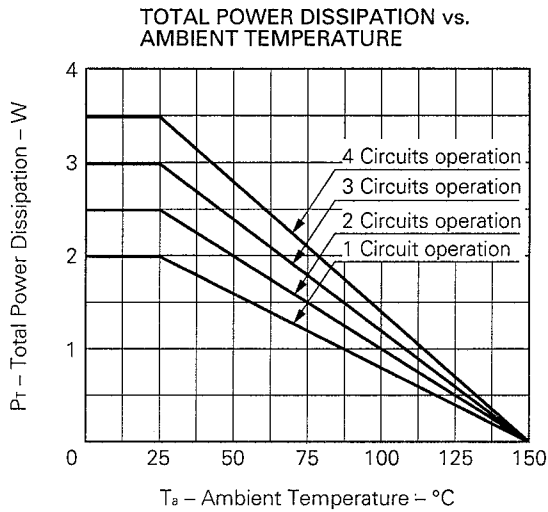
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = 100 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±100	nA	V _{GS} = ±20 V, V _{DS} = 0
Gate to Source Cutoff Voltage	V _{GS(off)}	1.0		2.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	4.0			S	V _{DS} = 10 V, I _D = 3 A
Drain to Source On-state Resistance	R _{DS(on)1}		0.2	0.45	Ω	V _{GS} = 10 V, I _D = 5 A
Drain to Source On-state Resistance	R _{DS(on)2}		0.25	0.5	Ω	V _{GS} = 4 V, I _D = 5 A
Input Capacitance	C _{iss}		900		pF	V _{DS} = 10 V V _{GS} = 0 f = 1.0 MHz
Output Capacitance	C _{oss}		250		pF	
Reverse Transfer Capacitance	C _{rss}		50		pF	
Turn-On Delay Time	t _{d(on)}		10		ns	I _D = 3 A V _{GS} = 10 V V _{CC} = 50 V R _L = 17 Ω R _{in} = 10 Ω See Fig. 1
Rise Time	t _r		40		ns	
Turn-Off Delay Time	t _{d(off)}		110		ns	
Fall Time	t _f		30		ns	

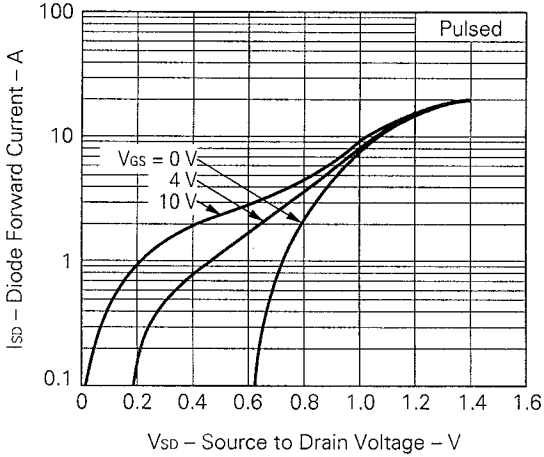
Fig. 1 Switching Time Test Circuit



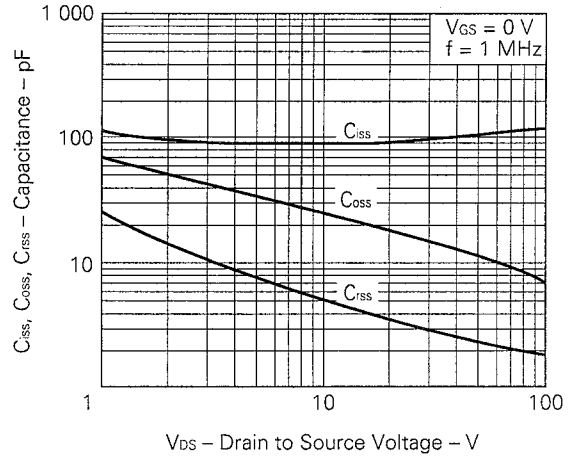
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



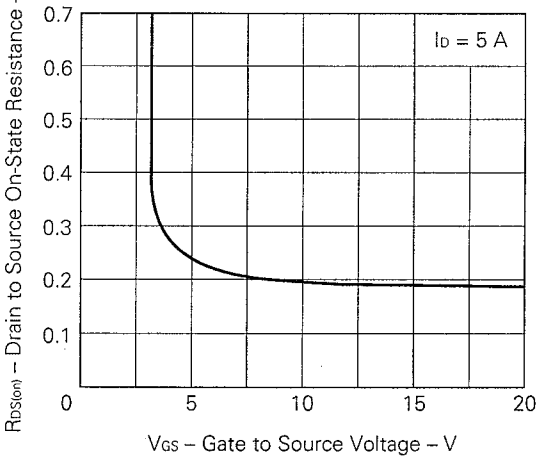
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



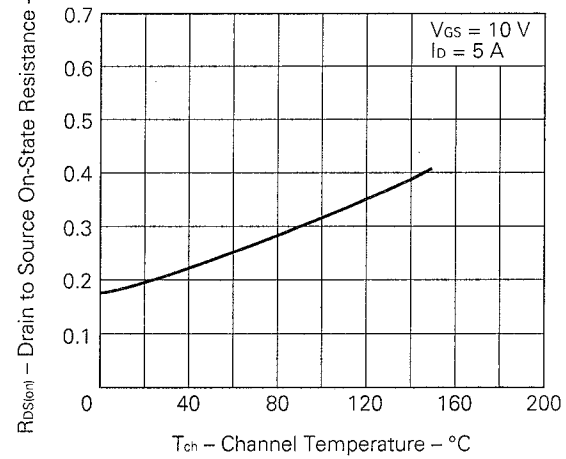
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



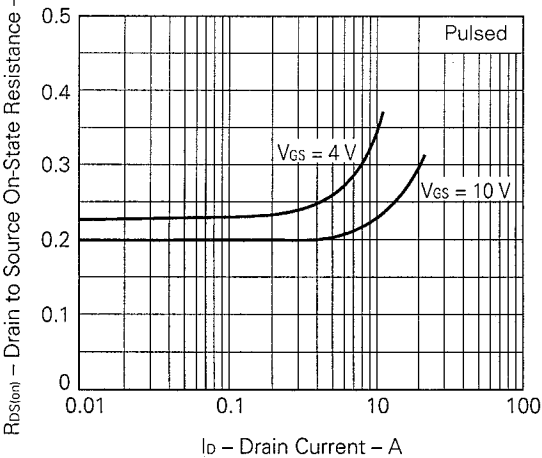
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



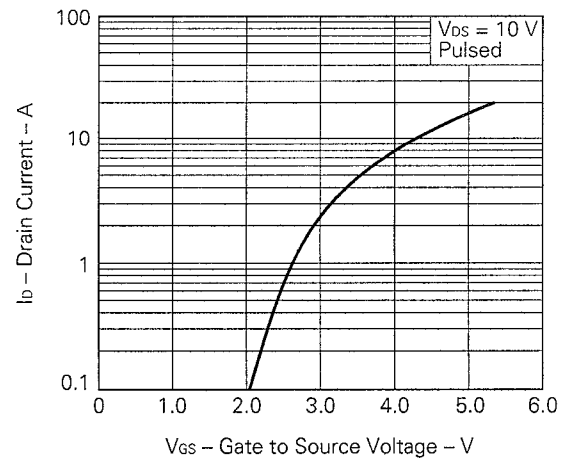
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



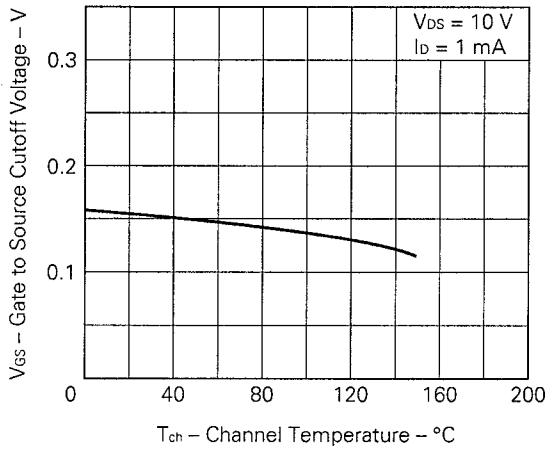
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



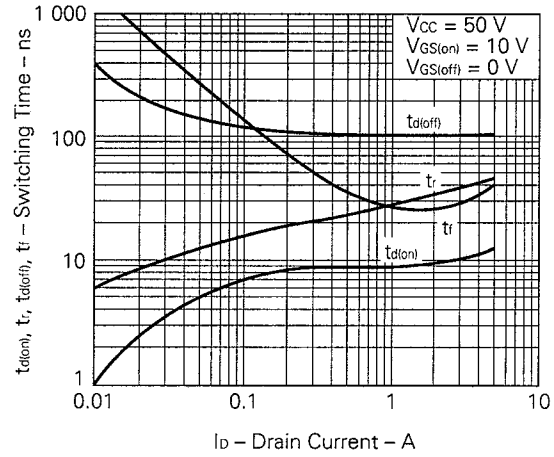
TRANSFER CHARACTERISTICS



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



SWITCHING TIME vs. DRAIN CURRENT



Reference

Application note name	No.
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207
Safe operating area of Power MOS FET	TEA-1034
Appication circuit using Power MOS FET	TEA-1035

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Application examples recommended by NEC Corporation.

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Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.