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P1 98.2

P-CHANNEL POWER MOS FET ARRAY SWITCHING TYPE

DESCRIPTION

The μPA1523 is P-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
 $I_{D(pulse)} = \mp 8 \text{ A}$
 $R_{DS(on)} \leq 0.8 \Omega \text{ MAX. (} V_{GS} = -10 \text{ V)}$
 $R_{DS(on)} \leq 1.3 \Omega \text{ MAX. (} V_{GS} = -4 \text{ V)}$
- 2.54 mm Pitch (0.1 inch)

ORDERING INFORMATION

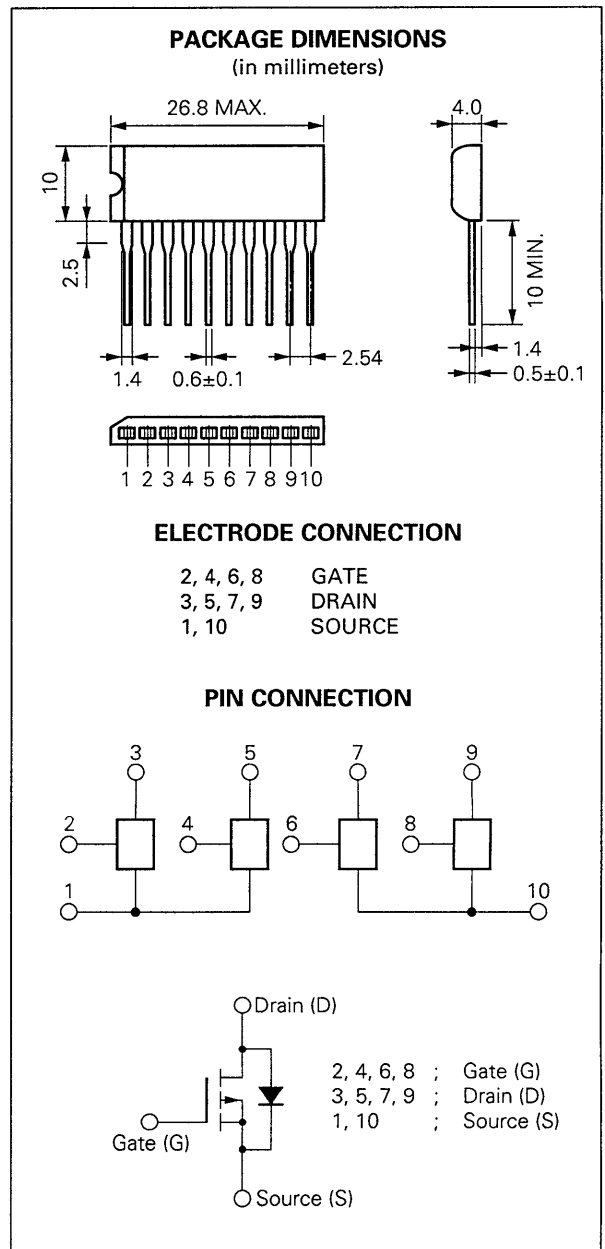
Part Number	Package	Quality Grade
μPA1523H	10-Pin SIP	Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-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 °C)

Drain to Source Voltage	V _{DSS}	-60	V
Gate to Source Voltage	V _{GSS(AC)}	±20	V
Drain Current (DC)	I _{D(DC)}	±2.0	A/unit
Drain Current (pulse)	I _{D(pulse)*}	±8.0	A/unit
Total Power Dissipation (4 circuits) <T _c = 25 °C>	P _{T1}	28	W
Total Power Dissipation (4 circuits) <T _a = 25 °C>	P _{T2}	3.5	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

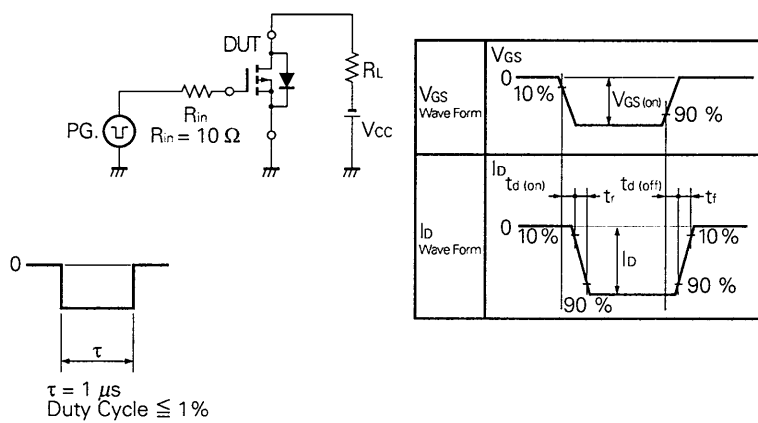
* PW ≤ 300 μs, Duty Cycle ≤ 10 %



ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

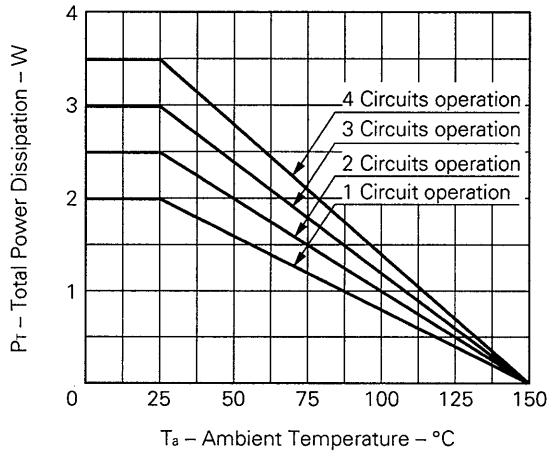
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Leakage Current	I _{DSS}			-10	μA	V _{DS} = -100 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±100	nA	V _{GS} = ±20 V, V _{DS} = 0
Gate to Source Cutoff Voltage	V _{GS(off)}	-1.0		-3.0	V	V _{DS} = -10 V, I _D = -1 mA
Forward Transfer Admittance	y _{fs}	1.0			S	V _{DS} = -10 V, I _D = -1 A
Drain to Source On-state Resistance	R _{DS(on)1}		0.6	0.8	Ω	V _{GS} = -10 V, I _D = -1 A
Drain to Source On-state Resistance	R _{DS(on)2}		0.9	1.3	Ω	V _{GS} = -4 V, I _D = -0.8 A
Input Capacitance	C _{iss}		800		pF	V _{DS} = -10 V V _{GS} = 0 f = 1.0 MHz
Output Capacitance	C _{oss}		190		pF	
Reverse Transfer Capacitance	C _{rss}		45		pF	
Turn-On Delay Time	t _{d(on)}		30		ns	I _D = -1 A V _{GS} = -10 V V _{DD} = -30 V R _L = 30 Ω, R _{in} = 10 Ω See Fig. 1
Rise Time	t _r		30		ns	
Turn-Off Delay Time	t _{d(off)}		130		ns	
Fall Time	t _f		40		ns	

Fig. 1 Switching Test Circuit

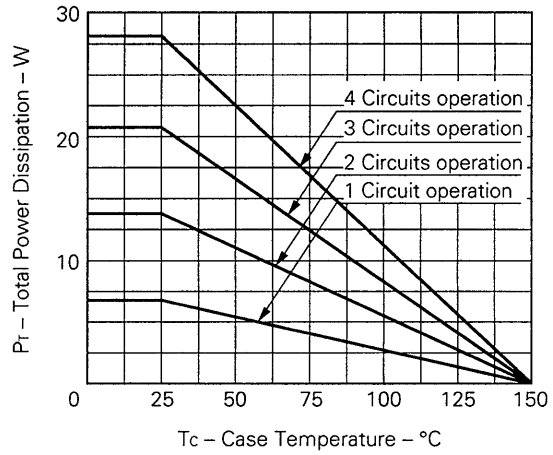


TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

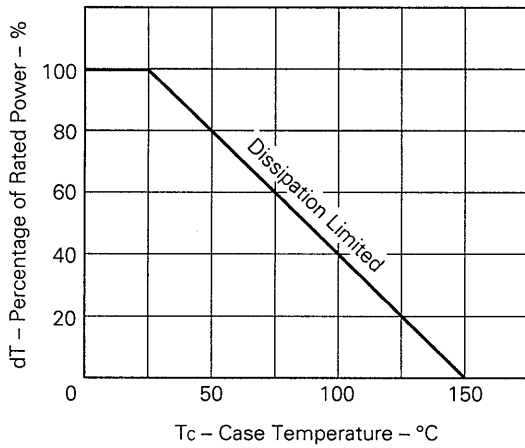
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



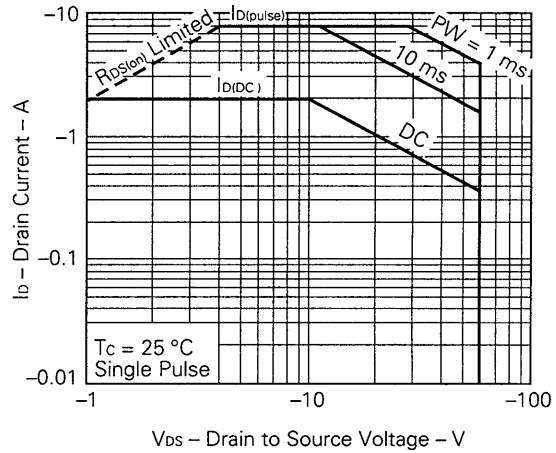
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



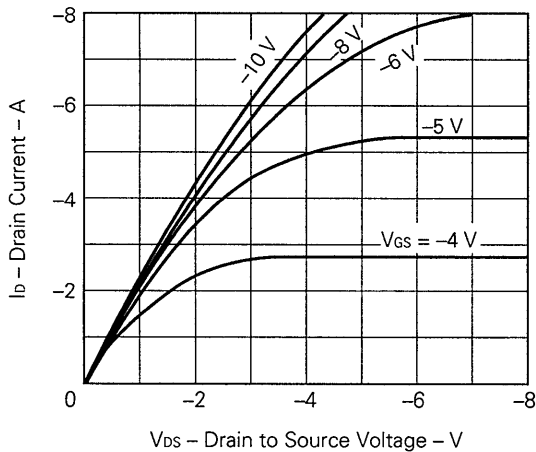
DERATING CURVE OF SAFE OPERATING AREA



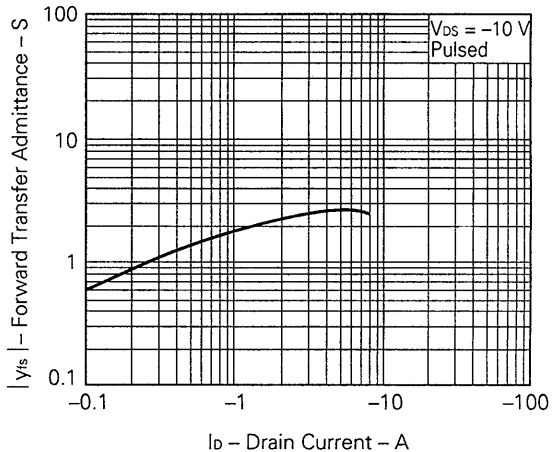
FORWARD BIAS SAFE OPERATING AREA



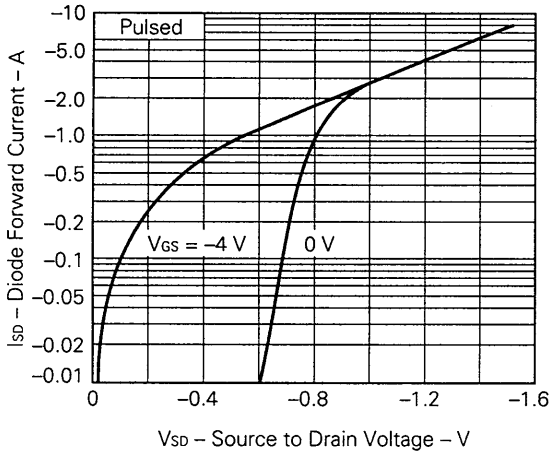
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



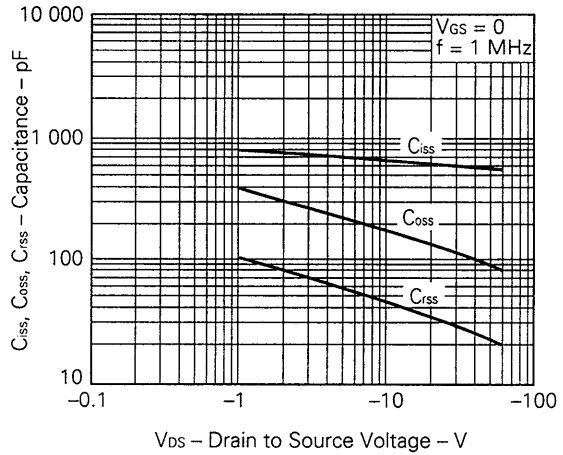
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



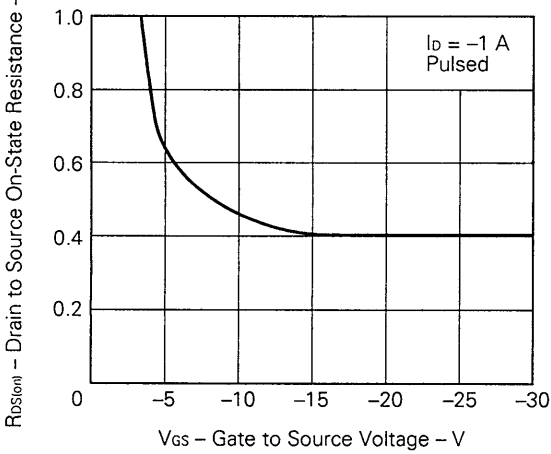
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



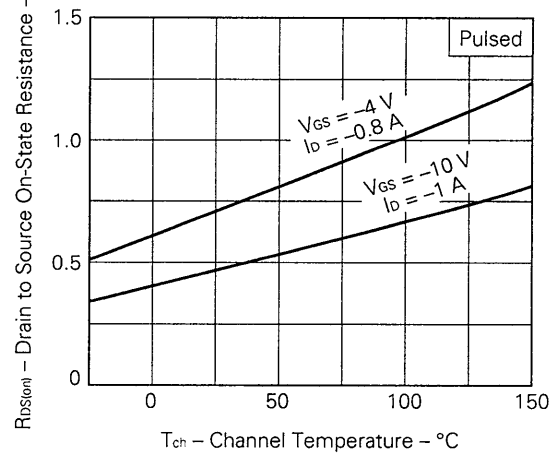
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



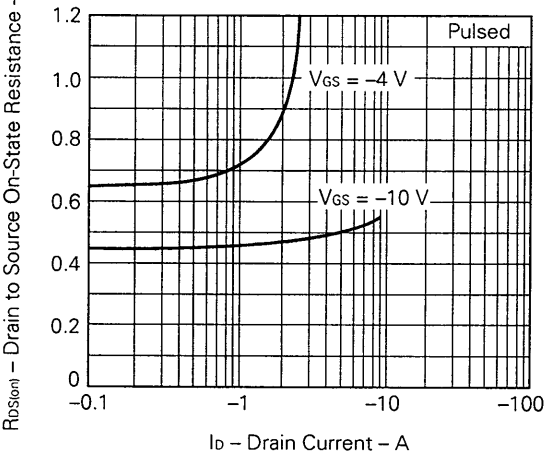
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



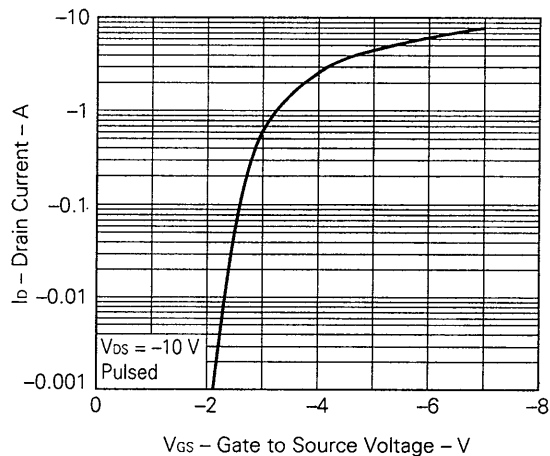
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



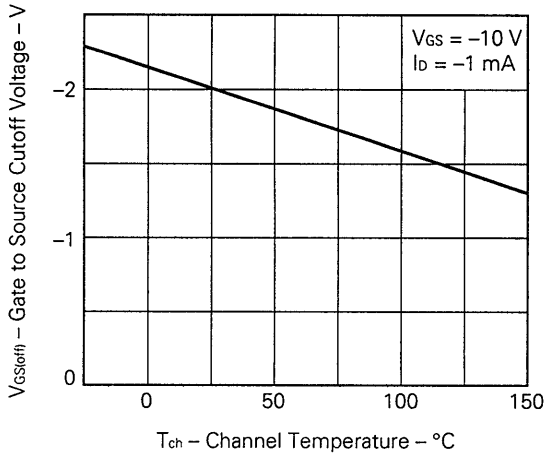
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



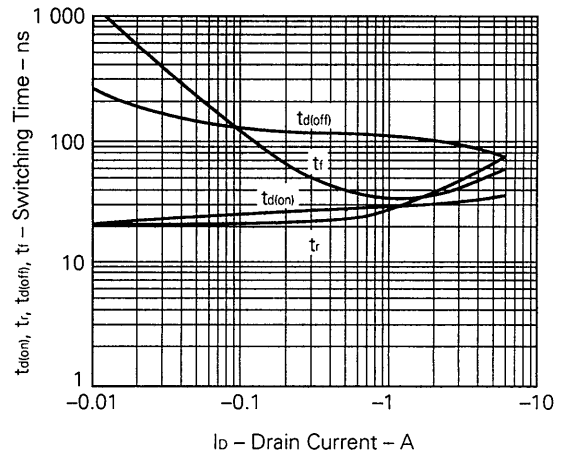
TRANSFER CHARACTERISTIC



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
Application circuit using Power MOS FET	TEB-1035

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