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P1 98.2

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

**DESCRIPTION**

The  $\mu$ PA1527 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  
 $I_{D(pulse)} = \mp 8$  A  
 $R_{DS(on)} \leq 1.0 \Omega$  MAX. ( $V_{GS} = -10$  V)  
 $R_{DS(on)} \leq 1.5 \Omega$  MAX. ( $V_{GS} = -4$  V)
- 2.54 mm Pitch (0.1 inch)

**ORDERING INFORMATION**

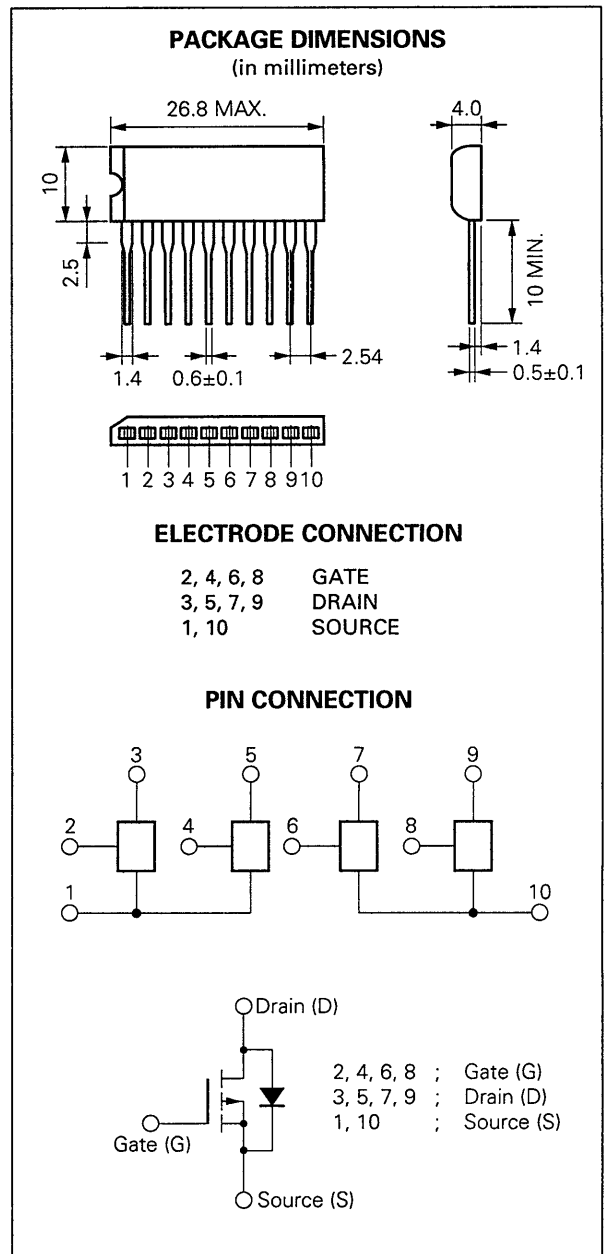
Part Number	Package	Quality Grade
$\mu$ PA1527H	10-Pin SIP	Standard

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

Drain to Source Voltage	$V_{DS}$	-100	V
Gate to Source Voltage	$V_{GS(AC)}$	$\mp 20$	V
Drain Current (DC)	$I_{D(DC)}$	$\mp 2.0$	A/unit
Drain Current (pulse)	$I_{D(pulse)^*}$	$\mp 8.0$	A/unit
Total Power Dissipation (4 circuits) < $T_c = 25^\circ\text{C}$ >	$P_{T1}$	28	W
Total Power Dissipation (4 circuits) < $T_a = 25^\circ\text{C}$ >	$P_{T2}$	3.5	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

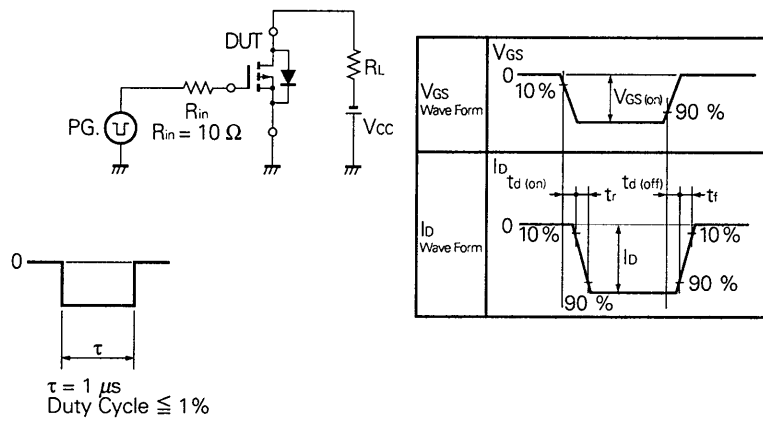
\*  $PW \leq 300 \mu\text{s}$ , Duty Cycle  $\leq 10\%$



**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

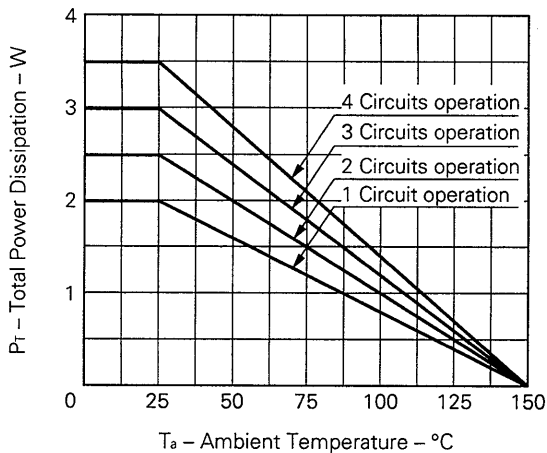
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Leakage Current	I <sub>DSS</sub>			-10	μA	V <sub>DS</sub> = -100 V, V <sub>GS</sub> = 0
Gate to Source Leakage Current	I <sub>GSS</sub>			±100	nA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0
Gate to Source Cutoff Voltage	V <sub>GS(off)</sub>	-1.0		-3.0	V	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 mA
Forward Transfer Admittance	y <sub>fs</sub>	1.0			S	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 A
Drain to Source On-state Resistance	R <sub>DS(on)1</sub>			1.0	Ω	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -1 A
Drain to Source On-state Resistance	R <sub>DS(on)2</sub>			1.5	Ω	V <sub>GS</sub> = -4 V, I <sub>D</sub> = -0.8 A
Input Capacitance	C <sub>iss</sub>		1 000		pF	V <sub>DS</sub> = -10 V V <sub>GS</sub> = 0 f = 1.0 MHz
Output Capacitance	C <sub>oss</sub>		200		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		25		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		30		ns	I <sub>D</sub> = -1 A V <sub>GS</sub> = -10 V V <sub>CC</sub> = -50 V R <sub>L</sub> = 50 Ω, R <sub>in</sub> = 10 Ω See Fig. 1
Rise Time	t <sub>r</sub>		30		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		110		ns	
Fall Time	t <sub>f</sub>		40		ns	

**Fig. 1 Switching Test Circuit**

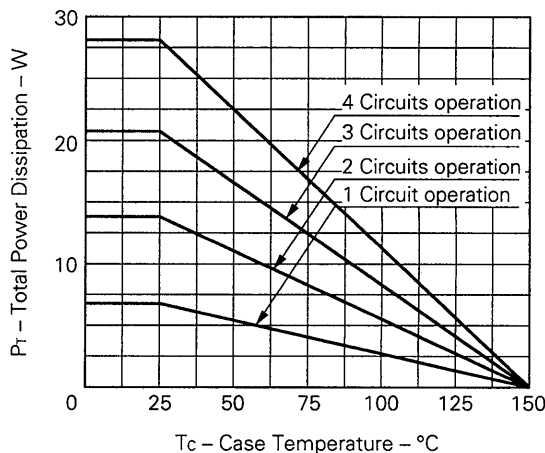


TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

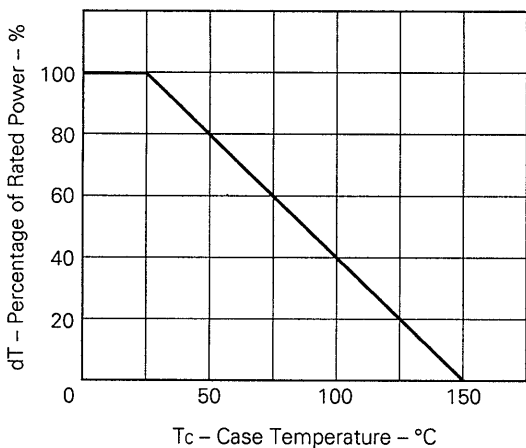
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



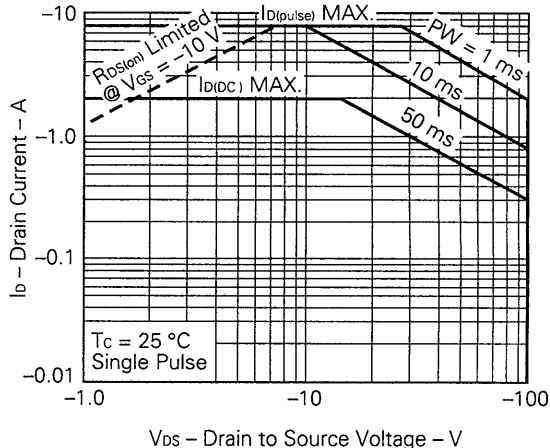
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



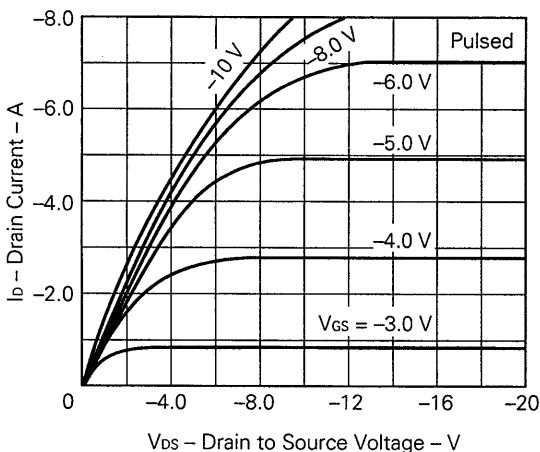
DERATING CURVE OF SAFE OPERATING AREA



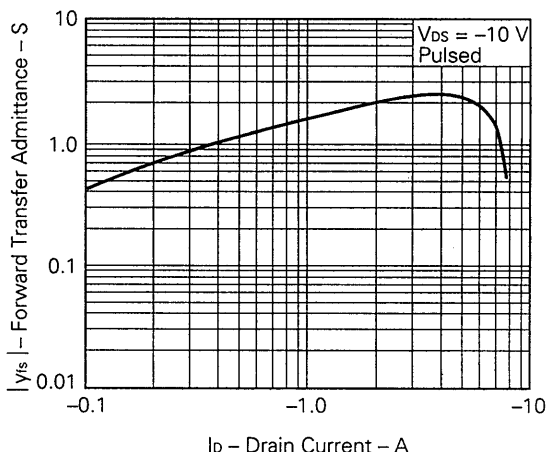
FORWARD BIAS SAFE OPERATING AREA



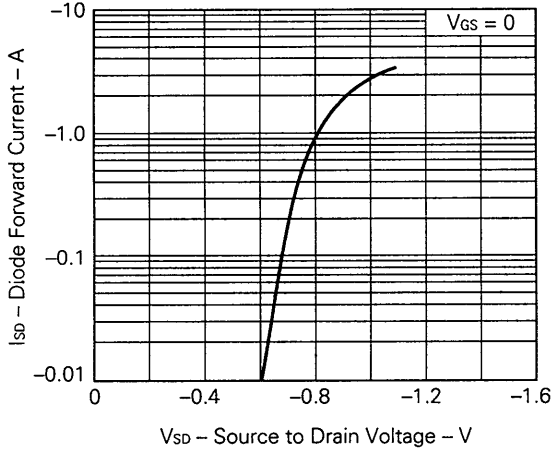
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



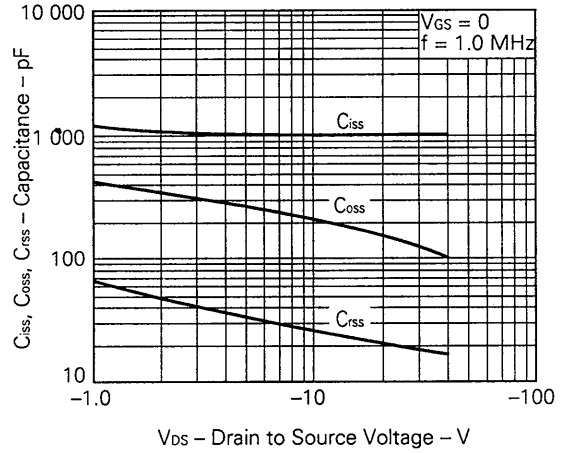
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



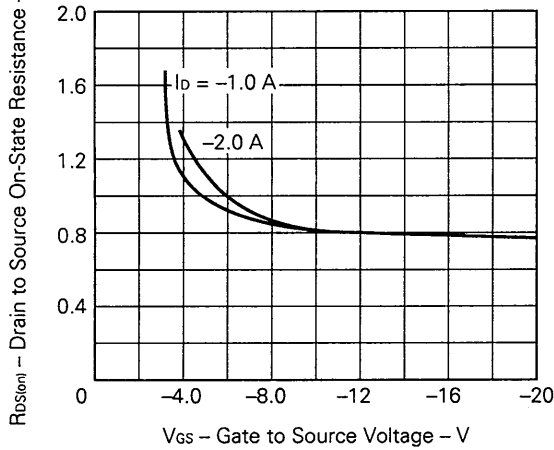
FORWARD VOLTAGE  
SOURCE TO DRAIN DIODE



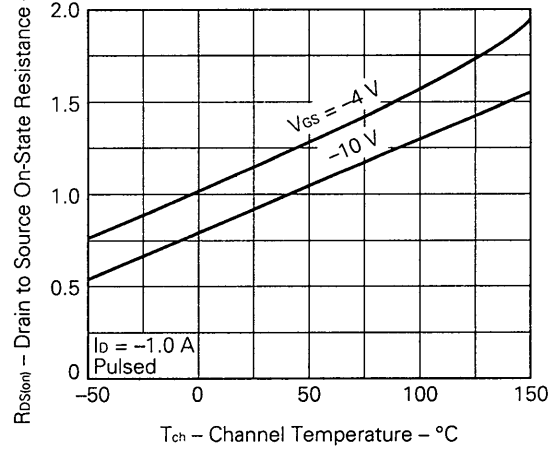
CAPACITANCE vs. DRAIN TO  
SOURCE VOLTAGE



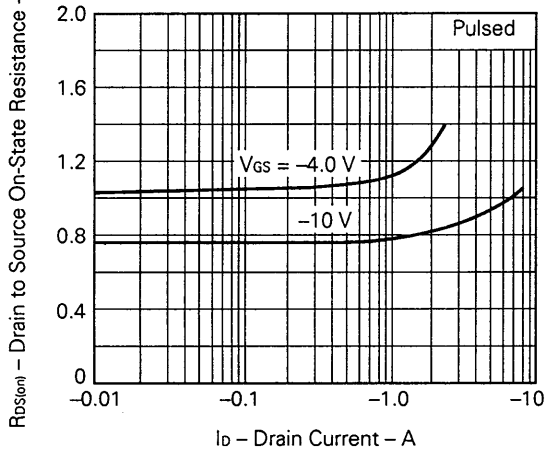
DRAIN TO SOURCE ON-STATE RESISTANCE  
vs. GATE TO SOURCE VOLTAGE



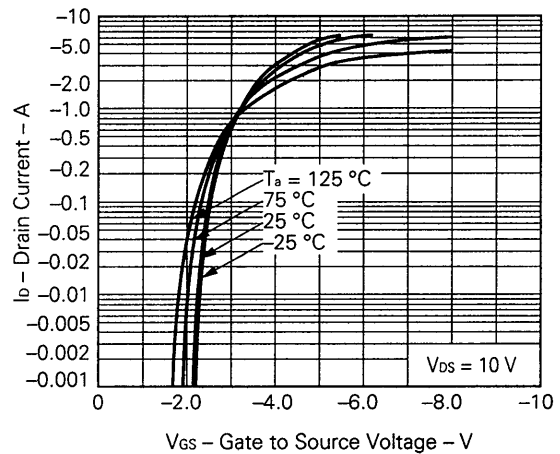
DRAIN TO SOURCE ON-STATE RESISTANCE  
vs. CHANNEL TEMPERATURE



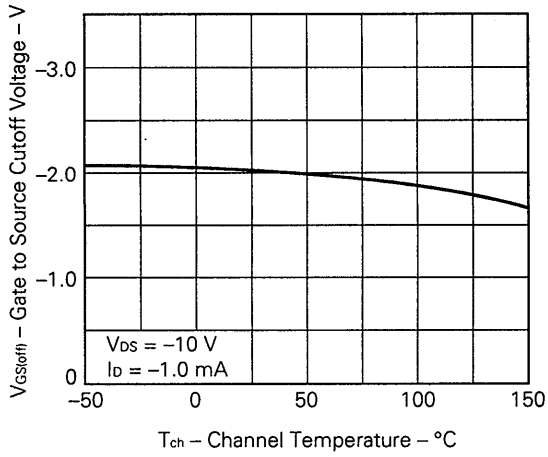
DRAIN TO SOURCE ON-STATE RESISTANCE  
vs. DRAIN CURRENT



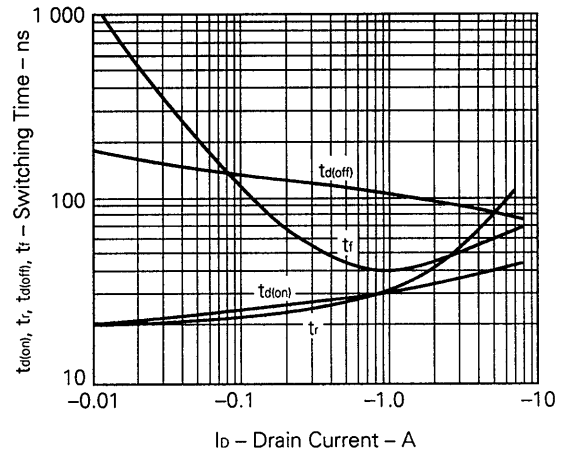
TRANSFER CHARACTERISTICS



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
Application circuit using Power MOS FET	TEB-1035

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