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# 4AK17

Silicon N-Channel Power MOS FET Array

# HITACHI

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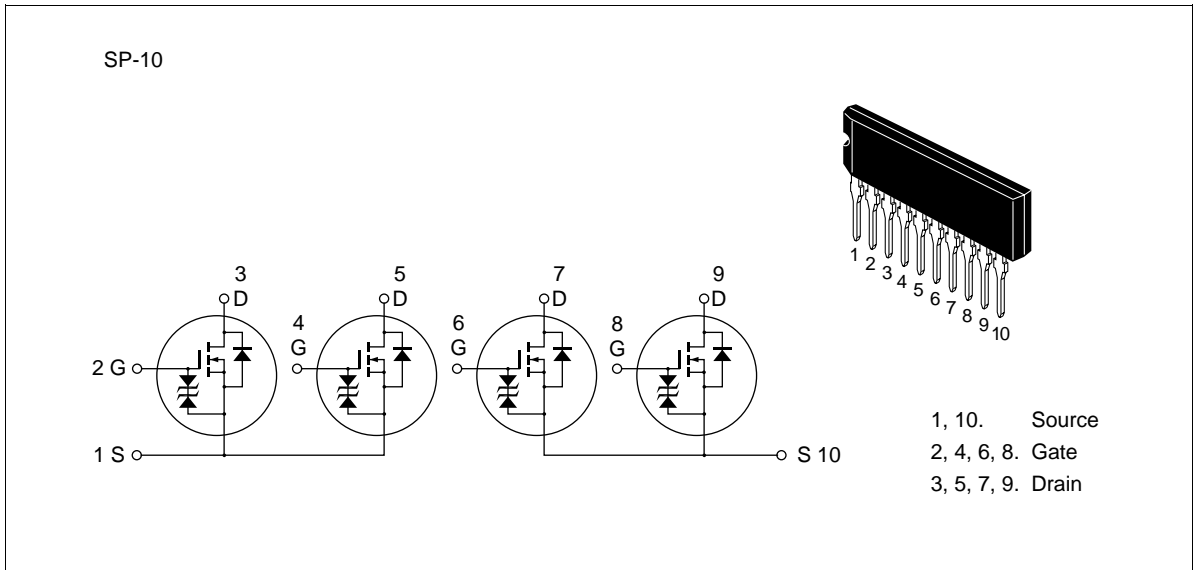
## Application

High speed power switching

## Features

- Low on-resistance  
 $R_{DS(on)} \leq 0.045$  ,  $V_{GS} = 10$  V,  $I_D = 10$  A  
 $R_{DS(on)} \leq 0.065$  ,  $V_{GS} = 4$  V,  $I_D = 10$  A
- Capable of 4 V gate drive
- Low drive current
- High speed switching
- High density mounting
- Suitable for motor driver, solenoid driver and lamp driver

## Outline



### Absolute Maximum Ratings (Ta = 25°C) (1 Unit)

Item	Symbol	Rating	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	10	A
Drain peak current	$I_{D(pulse)}^{*1}$	40	A
Body to drain diode reverse drain current	$I_{DR}$	10	A
Channel dissipation	$Pch (Tc = 25°C)^{*2}$	28	W
Channel dissipation	$Pch^{*2}$	4	W
Channel temperature	$Tch$	150	°C
Storage temperature	$Tstg$	-55 to +150	°C

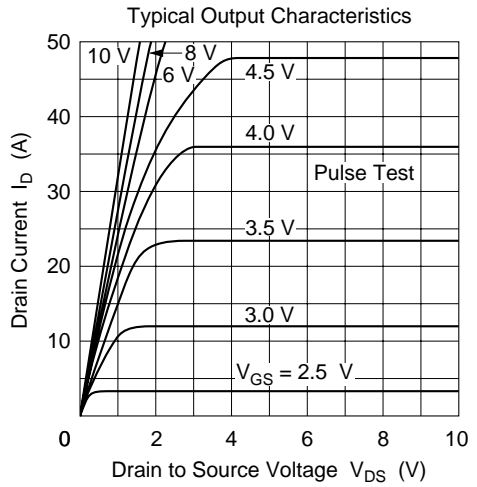
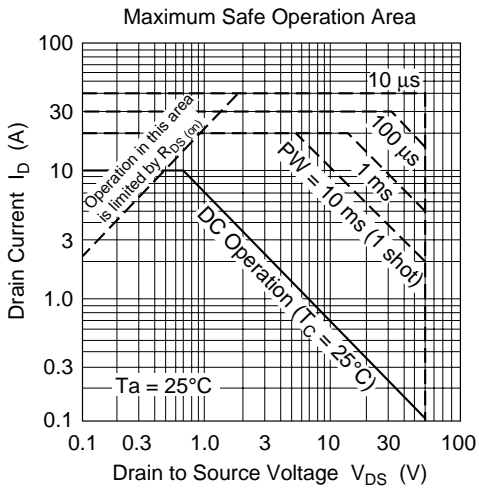
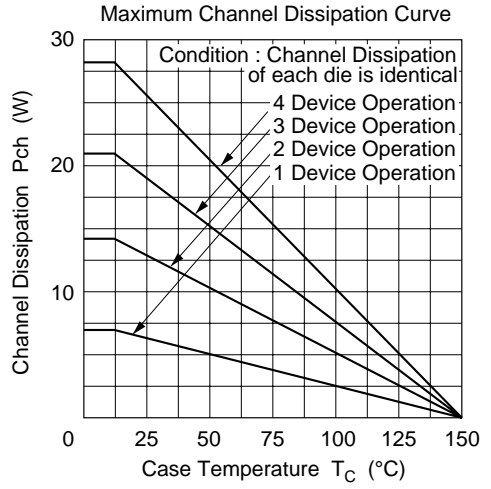
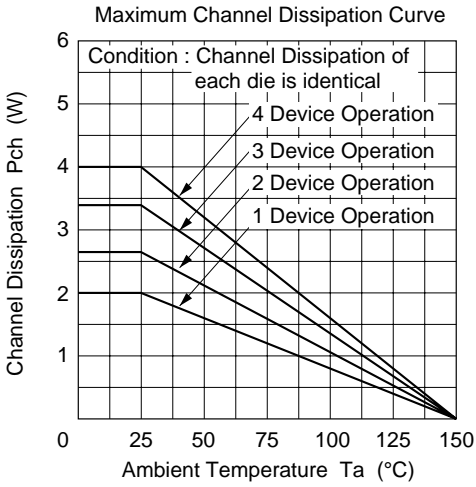
Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

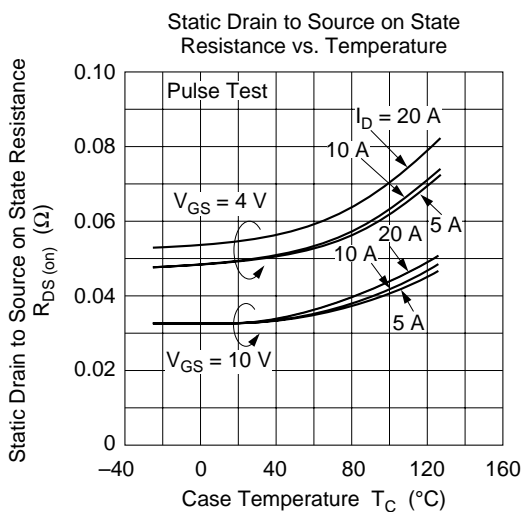
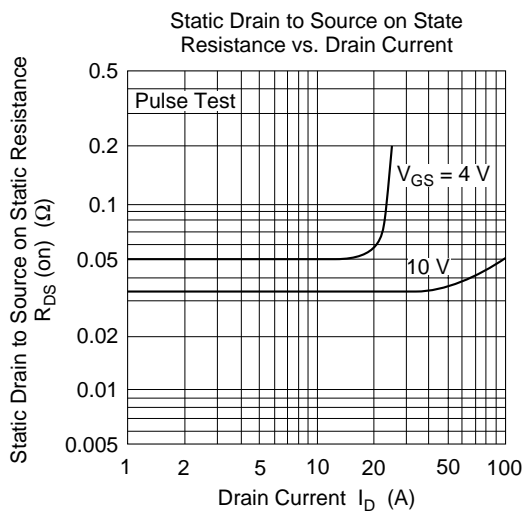
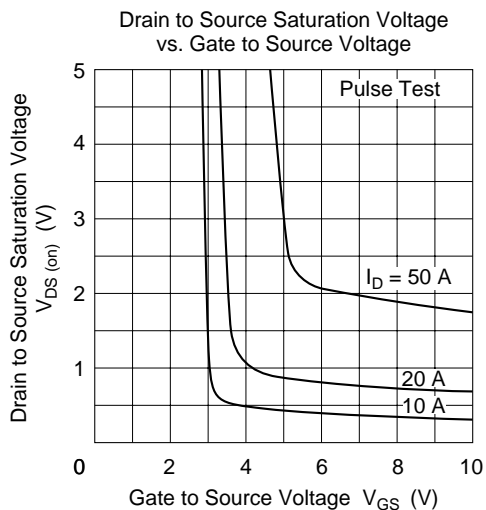
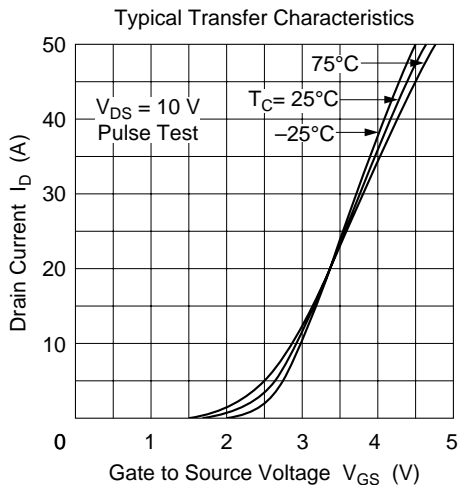
2. 4 devices operation

**Electrical Characteristics** (Ta = 25°C) (1 Unit)

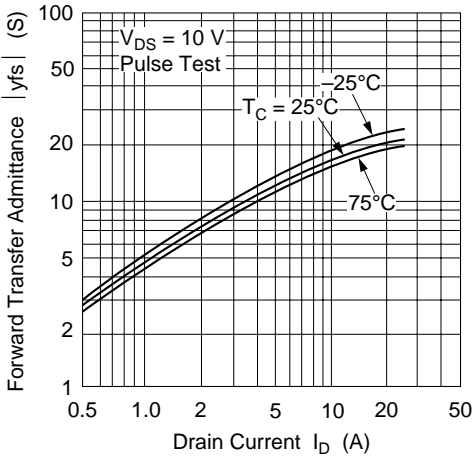
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 50 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.033	0.045	$\Omega$	$I_D = 10 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$
		—	0.04	0.065	$\Omega$	$I_D = 10 \text{ A}$ $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	10	17	—	S	$I_D = 10 \text{ A}$ $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	1400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	720	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	220	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 10 \text{ A}$
Rise time	$t_r$	—	95	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	300	—	ns	$R_L = 3 \text{ }\Omega$
Fall time	$t_f$	—	170	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.05	—	V	$I_F = 10 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	110	—	ns	$I_F = 10 \text{ A}$ , $V_{GS} = 0$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

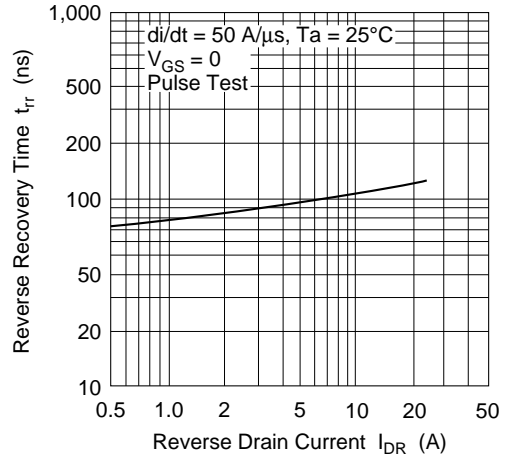




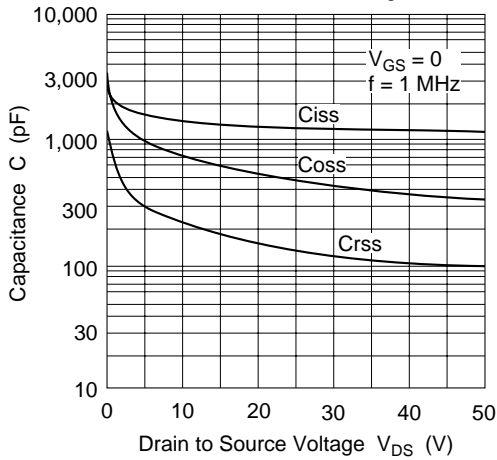
Forward Transfer Admittance vs. Drain Current



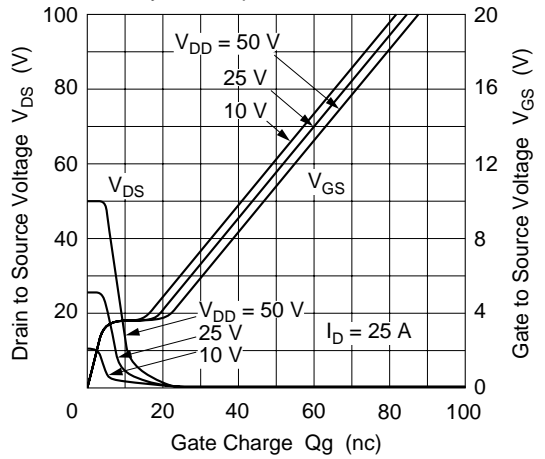
Body to Diode Reverse Recovery Time

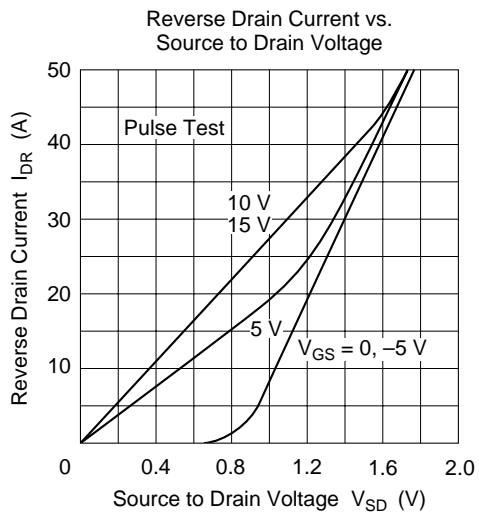
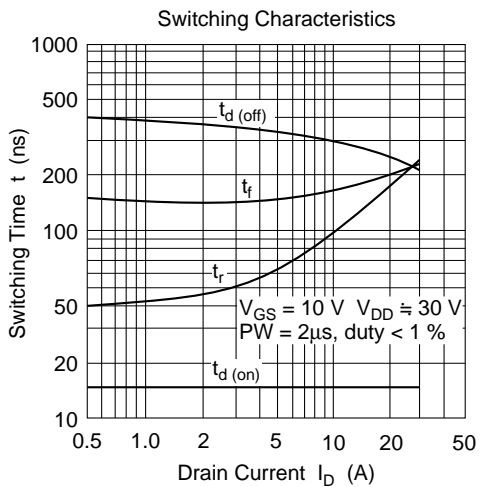


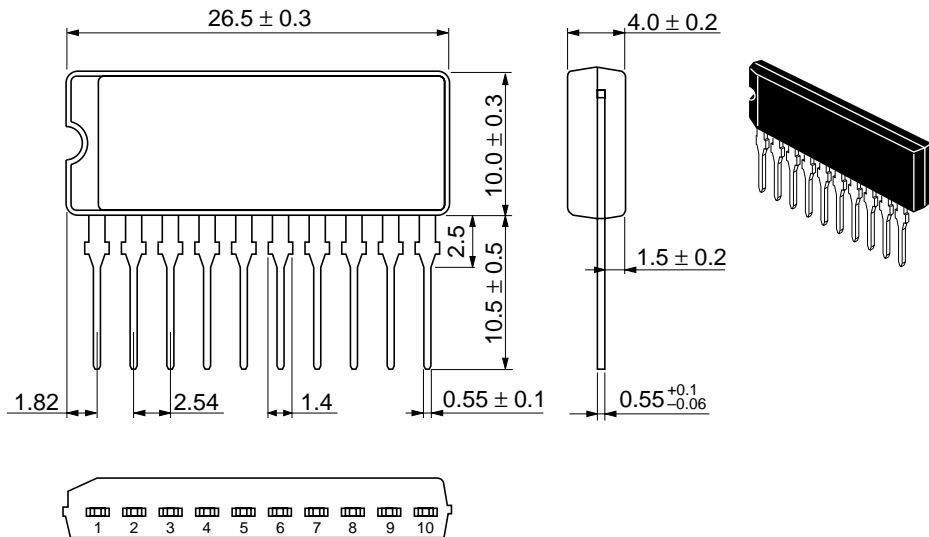
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics







Hitachi Code	SP-10
JEDEC	—
EIAJ	—
Weight (reference value)	2.9 g



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