
4AK16

Silicon N-Channel Power MOS FET Array

HITACHI

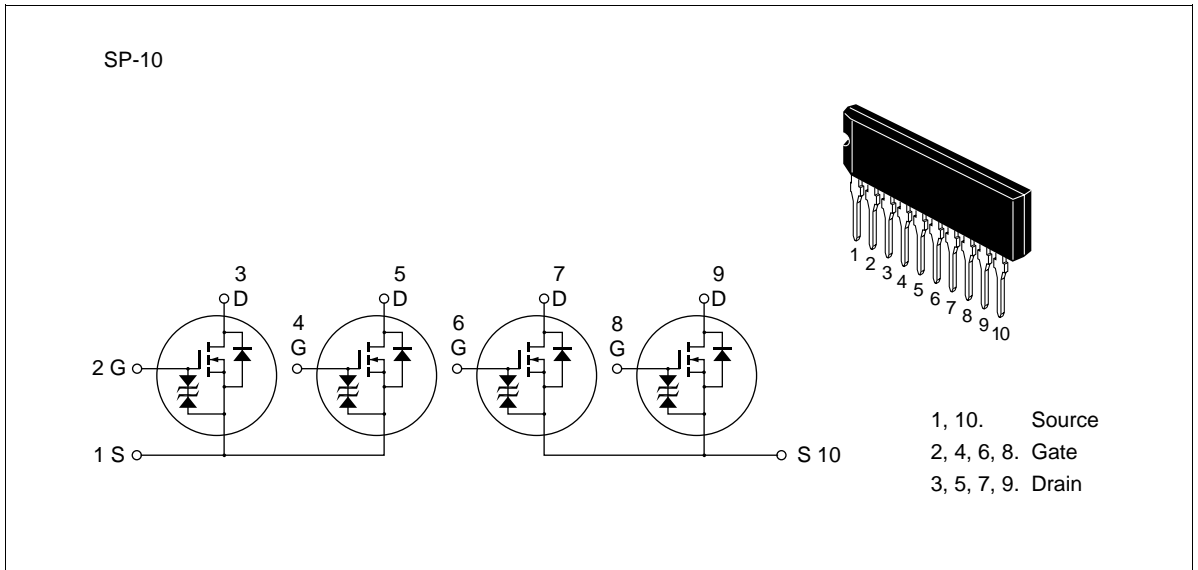
Application

High speed power switching

Features

- Low on-resistance
 $R_{DS(on)} \leq 0.18 \text{ } \Omega$, $V_{GS} = 10 \text{ V}$, $I_D = 5 \text{ A}$
 $R_{DS(on)} \leq 0.25 \text{ } \Omega$, $V_{GS} = 4 \text{ V}$, $I_D = 5 \text{ A}$
- 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	5	A
Drain peak current	$I_{D(pulse)}^{*1}$	20	A
Body to drain diode reverse drain current	I_{DR}	5	A
Channel dissipation	$P_{ch} (T_c = 25^\circ C)^{*2}$	28	W
Channel dissipation	P_{ch}^{*2}	4	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

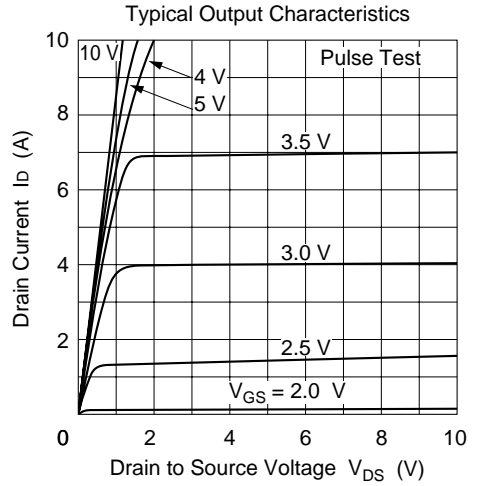
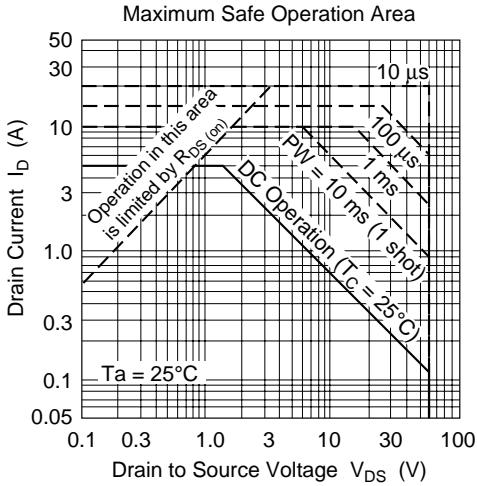
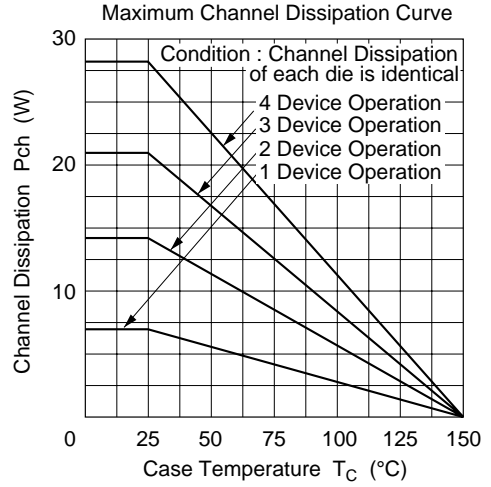
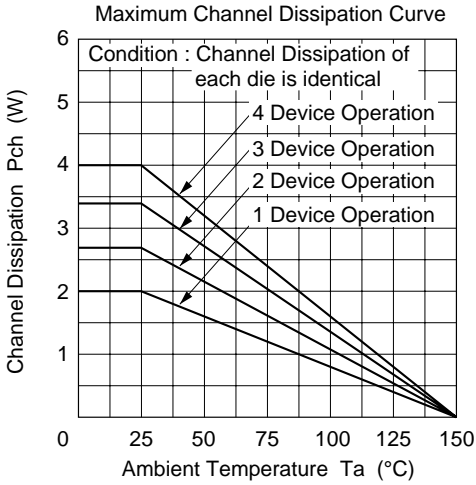
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

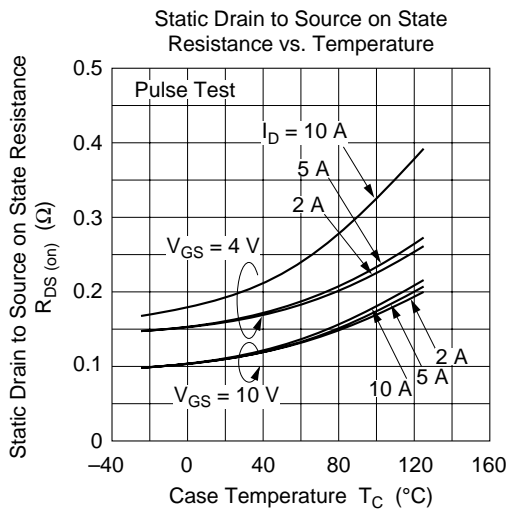
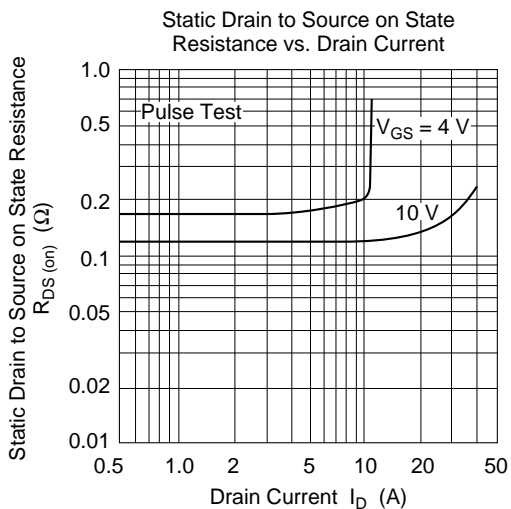
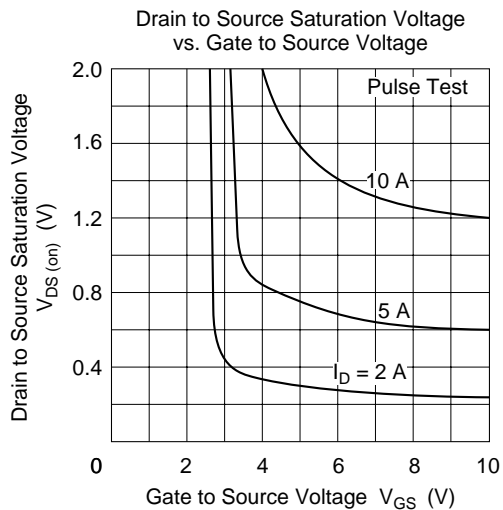
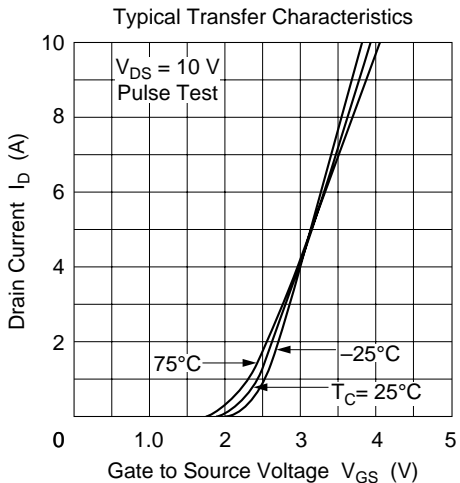
2. 4 devices operation

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

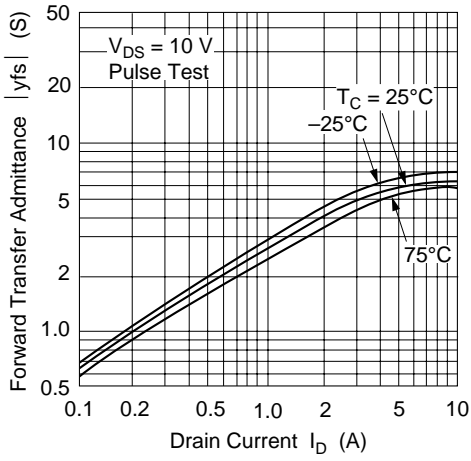
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	μA	$V_{DS} = 50 \text{ V}$, $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.12	0.18	Ω	$I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$
		—	0.17	0.25	Ω	$I_D = 5 \text{ A}$ $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	3.5	6.0	—	S	$I_D = 5 \text{ A}$ $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	220	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	60	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$I_D = 5 \text{ A}$
Rise time	t_r	—	55	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	140	—	ns	$R_L = 6 \text{ }\Omega$
Fall time	t_f	—	90	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	$I_F = 5 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 5 \text{ A}$, $V_{GS} = 0$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

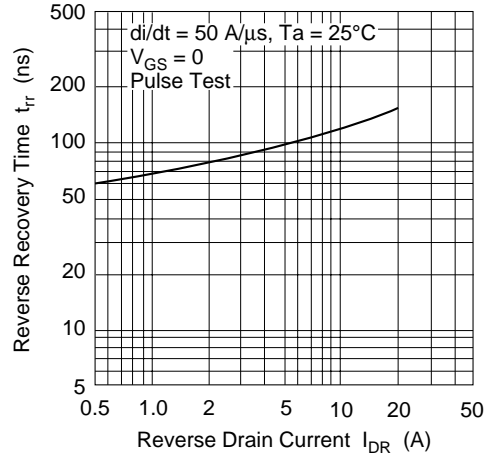




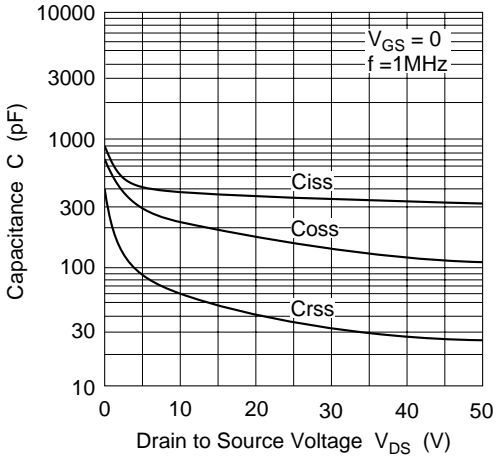
Forward Transfer Admittance vs. Drain Current



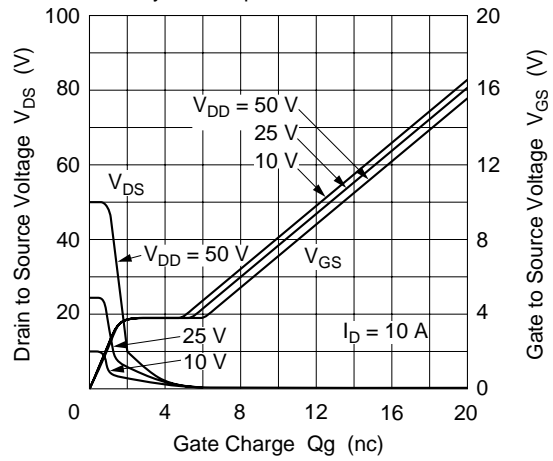
Body to Drain Diode Reverse Recovery Time

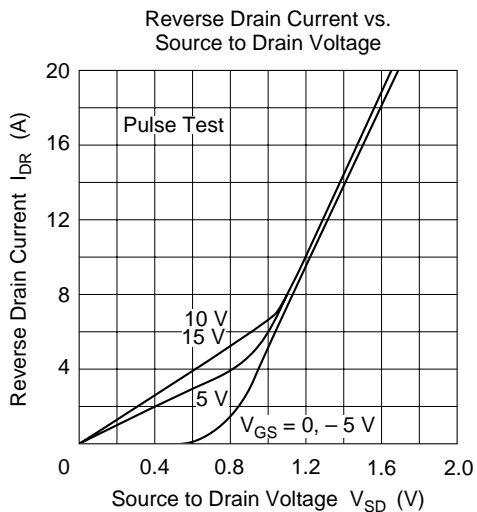
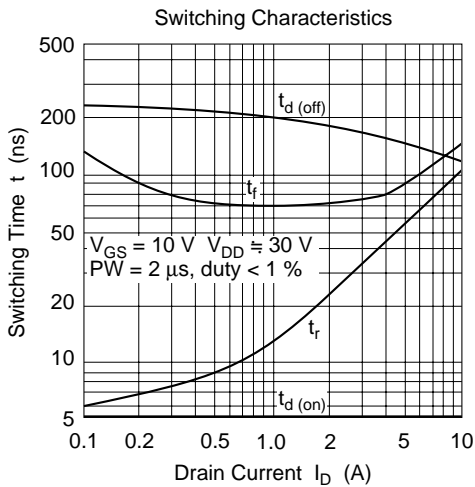


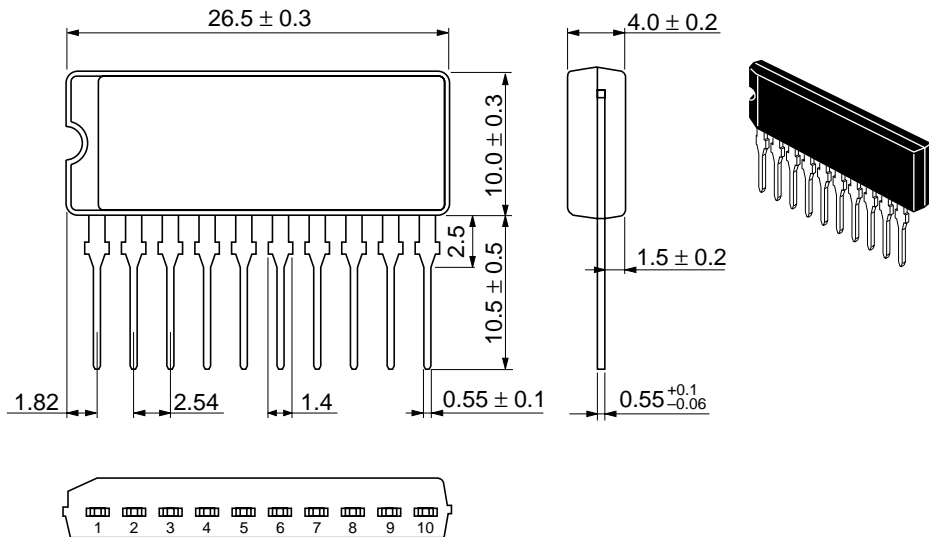
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics







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

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