
2SK1402, 2SK1402A

Silicon N-Channel MOS FET

HITACHI

Application

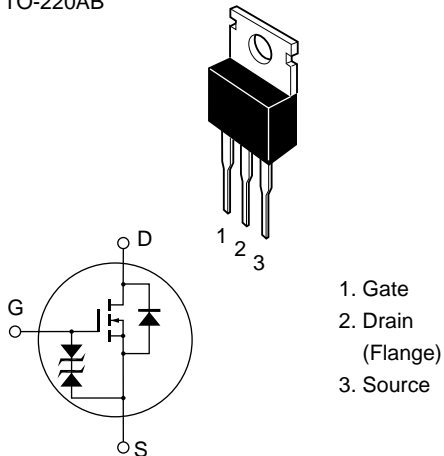
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

Outline

TO-220AB



2SK1402, 2SK1402A

Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1402	V_{DSS}	600	V
	2SK1402A		650	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	4	A
Drain peak current		$I_{D(pulse)}^{*1}$	16	A
Body to drain diode reverse drain current		I_{DR}	4	A
Channel dissipation		P_{ch}^{*2}	50	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

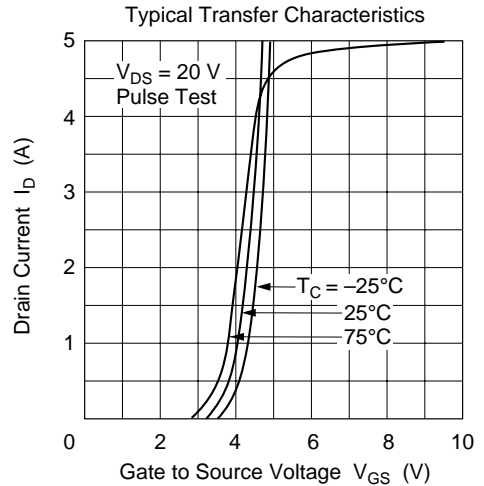
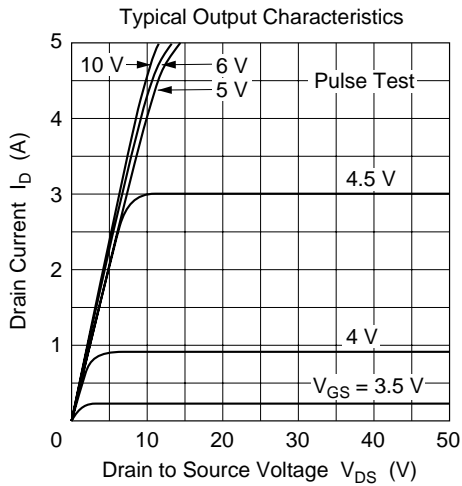
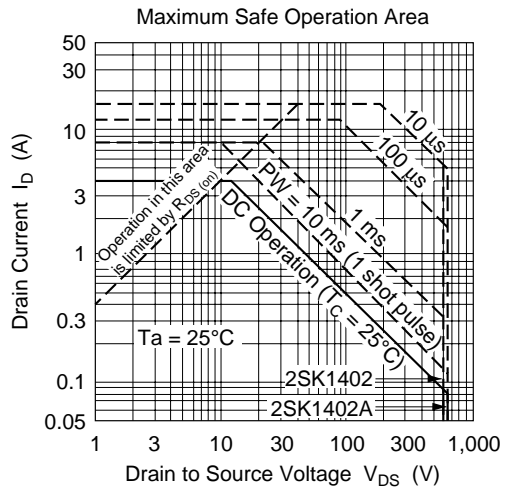
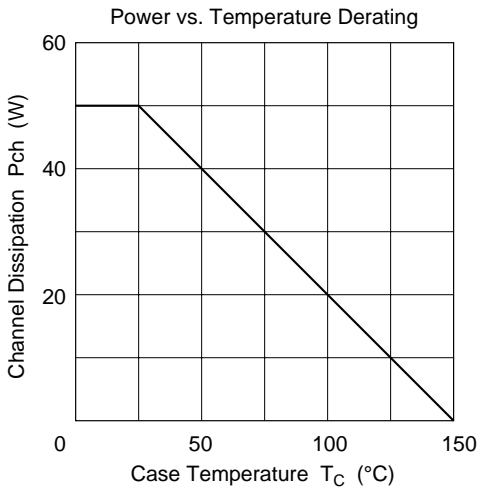
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

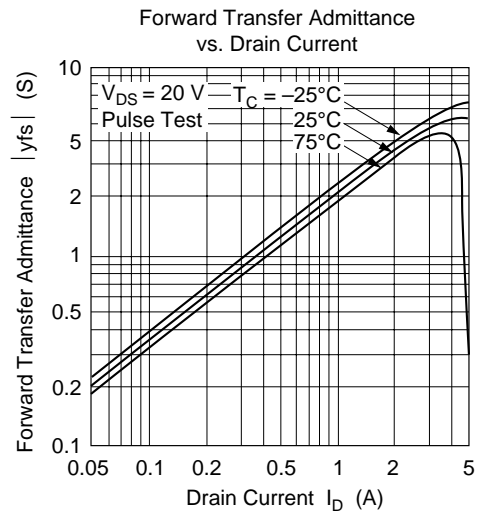
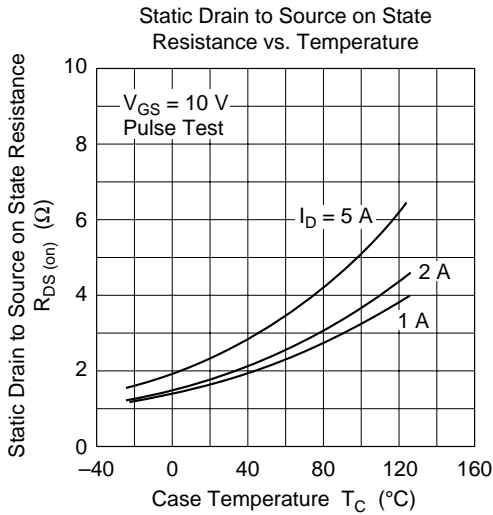
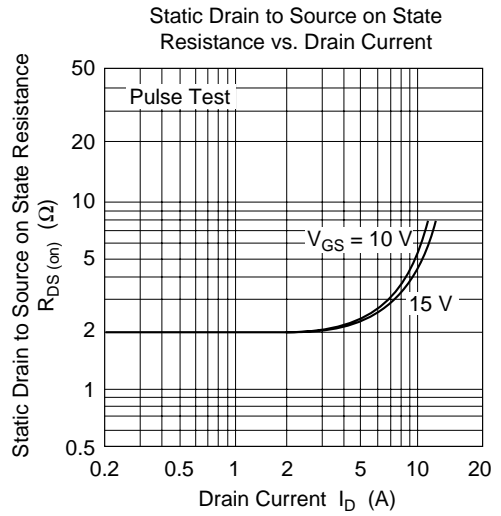
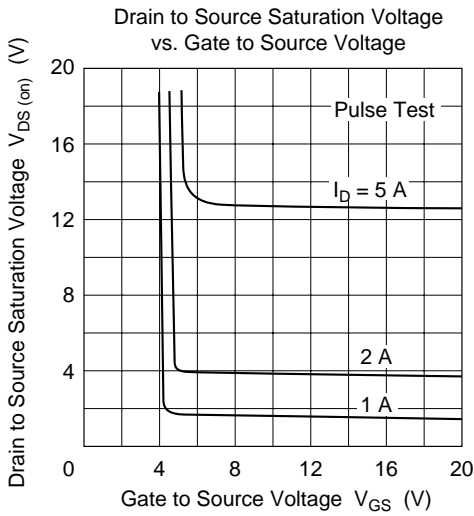
2. Value at $T_c = 25^\circ C$

Electrical Characteristics (Ta = 25°C)

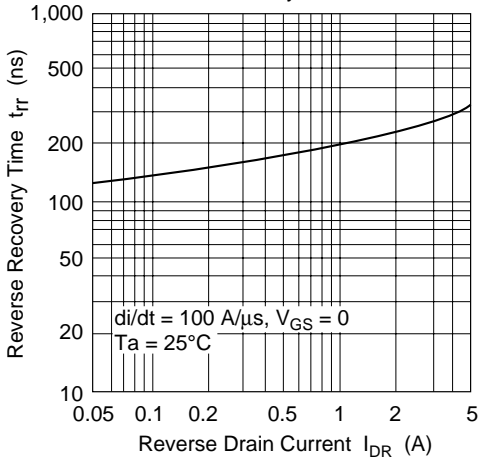
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1402 K1402A	$V_{(BR)DSS}$	600 650	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	± 30	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current		I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	K1402 K1402A	I_{DSS}	—	—	250	μA	$V_{DS} = 500 \text{ V}, V_{GS} = 0$ $V_{DS} = 550 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage		$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	K1402 K1402A	$R_{DS(on)}$	— —	1.8 2.0	2.4 2.6	Ω	$I_D = 2 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance		$ y_{fs} $	2.2	3.5	—	S	$I_D = 2 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance		C_{iss}	—	600	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance		C_{oss}	—	140	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance		C_{rss}	—	25	—	pF	
Turn-on delay time		$t_{d(on)}$	—	8	—	ns	$I_D = 2 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time		t_r	—	30	—	ns	$R_L = 15 \text{ }\Omega$
Turn-off delay time		$t_{d(off)}$	—	60	—	ns	
Fall time		t_f	—	35	—	ns	
Body to drain diode forward voltage		V_{DF}	—	0.9	—	V	$I_F = 4 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time		t_{rr}	—	300	—	ns	$I_F = 4 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

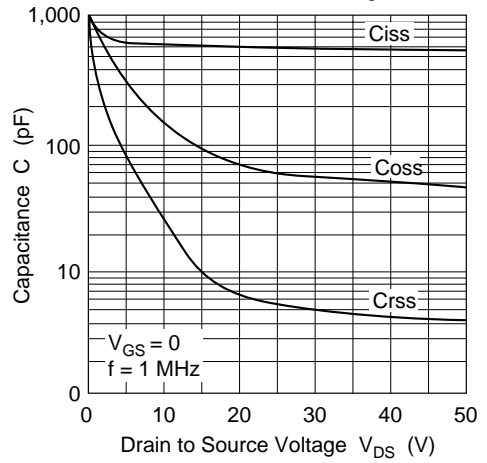




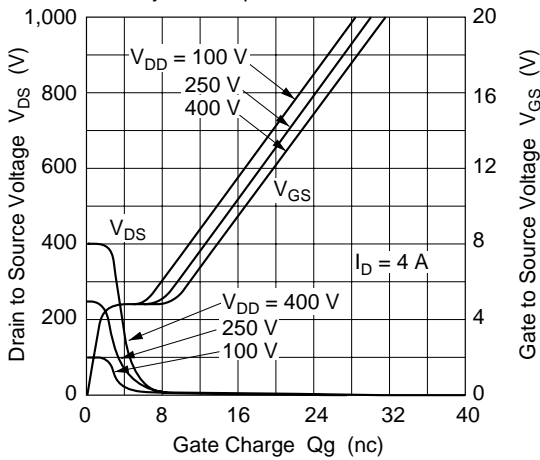
Body to Drain Diode Reverse Recovery Time



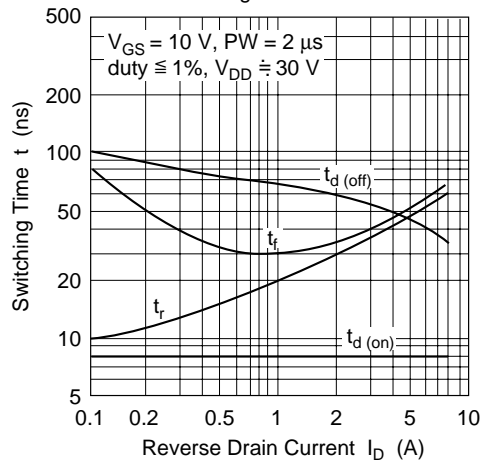
Typical Capacitance vs. Drain to Source Voltage

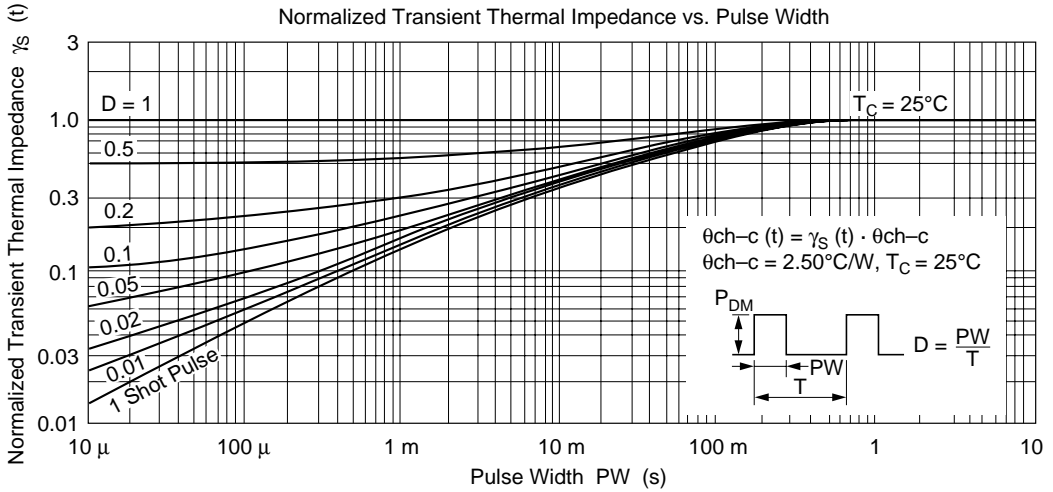
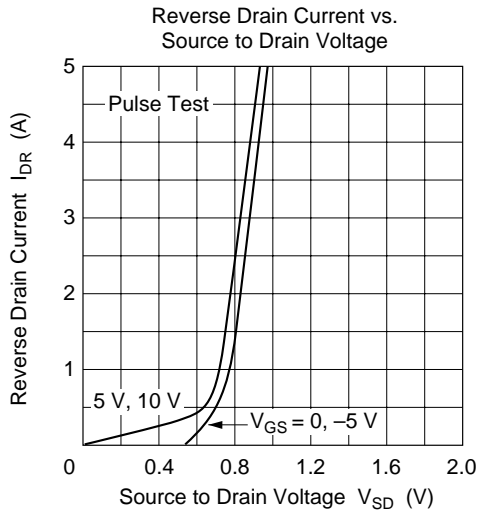


Dynamic Input Characteristics

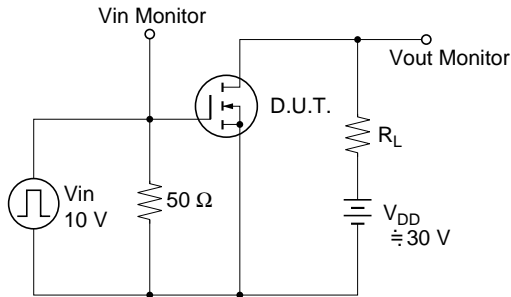


Switching Characteristics

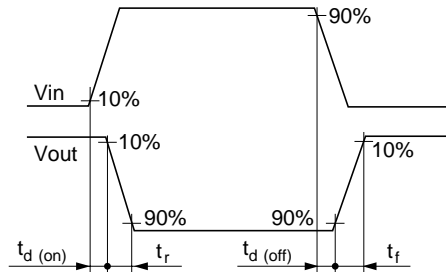


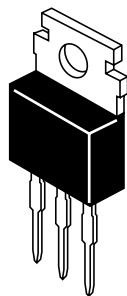
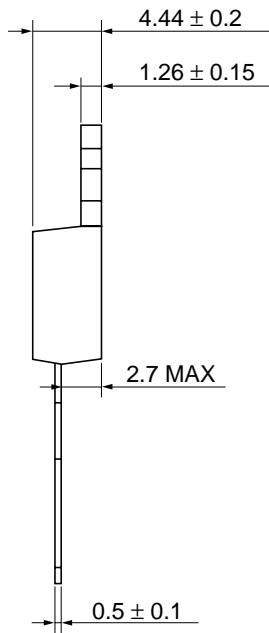
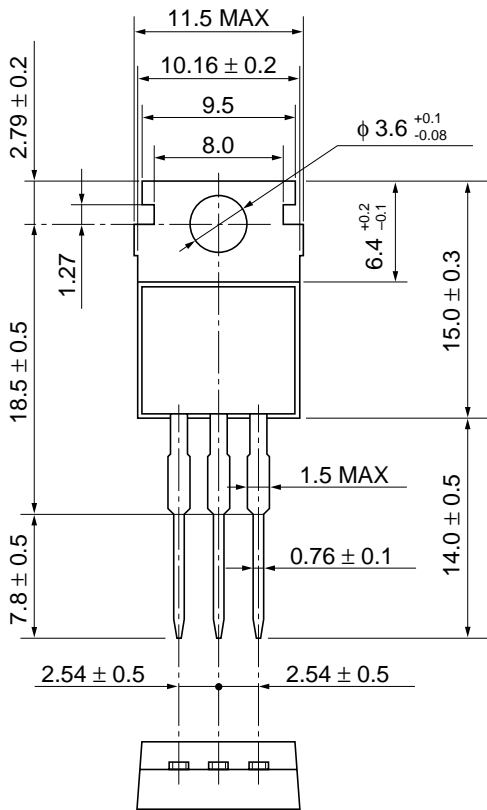


Switching Time Test Circuit



Waveforms





Hitachi Code	TO-220AB
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.8 g

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