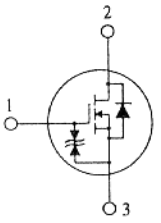
HITACHI

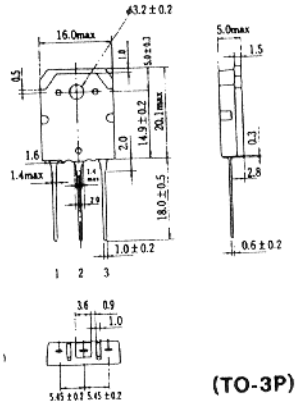
2SK1401,2SK1401A

SILICON N-CHANNEL MOS FET
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





1. Gate
2. Drain (Flange)
3. Source

(Dimensions in mm)

(TO-3P)

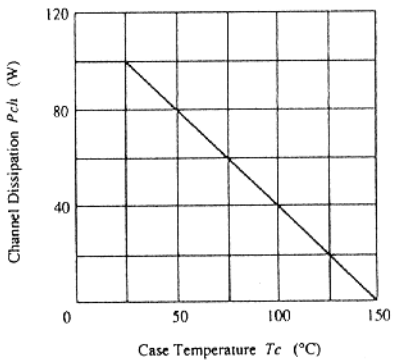
■ ABSOLUTE MAXIMUM RATINGS (Ta = 25℃)

Item	Symbol	K1401	K1401A	Unit
Drain-Source Voltage	V_{DSS}	300	350	V
Gate-Source Voltage	V_{GSS}	±30		V
Drain Current	I_D	15		A
Drain Peak Current	$I_{D(pulse)}$*	60		A
Body-Drain Diode Reverse Drain Current	I_{DR}	15		A
Channel Dissipation	P_{ch}**	100		W
Channel Temperature	Tch	150		℃
Storage Temperature	Tstg	−55~+150		℃

*PW≦10 μs, duty cycle≦1%

**Value at Tc = 25℃

POWER VS. TEMPERATURE DERATING

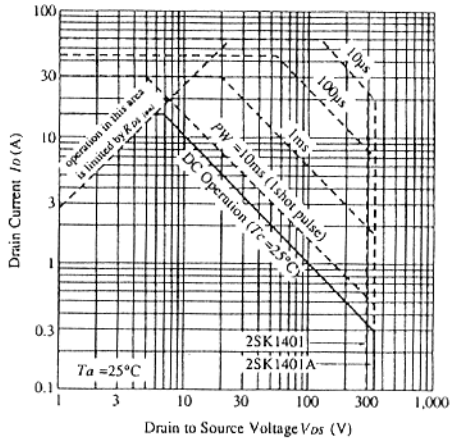


■ ELECTRICAL CHARACTERISTICS (Ta = 25℃)

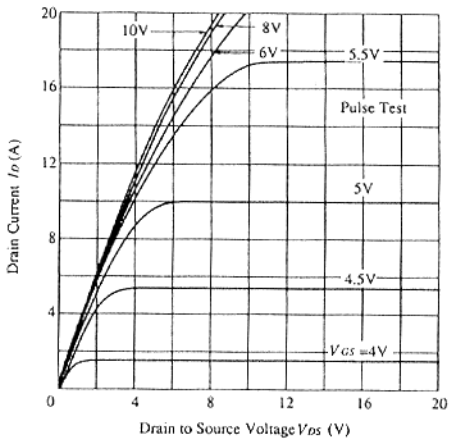
Item		Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	K1401	$V_{(BR)\ DSS}$	I_D = 10mA, V_{GS} = 0	300	—	—	V
	K1401A			350	—	—	
Gate-Source Breakdown Voltage		$V_{(BR)\ GSS}$	I_G = ±100 μA, V_{DS} = 0	±30	—	—	V
Gate-Source Leak Current		I_{GSS}	V_{GS} = ±25V, V_{DS} = 0	—	—	±10	μA
Zero Gate Voltage Drain Current	K1401	I_{DSS}	V_{DS} = 240V, V_{GS} = 0	—	—	250	μA
	K1401A		V_{DS} = 280V, V_{GS} = 0				
Gate-Source Cutoff Voltage		$V_{GS(off)}$	I_D = 1mA, V_{DS} = 10V	2.0	—	3.0	V
Static Drain-Source on State Resistance	K1401	$R_{DS(on)}$	I_D = 8A, V_{GS} = 10V*	—	0.25	0.35	Ω
	K1401A			—	0.30	0.40	
Forward Transfer Admittance		| yfs |	I_D = 8A, V_{DS} = 10V*	6	9.5	—	S
Input Capacitance		Ciss	V_{DS} = 10V, V_{GS} = 0, f = 1MHz	—	1250	—	pF
Output Capacitance		Coss		—	420	—	pF
Reverse Transfer Capacitance		Crss		—	70	—	pF
Turn-on Delay Time		$t_{d(on)}$	I_D = 8A, V_{GS} = 10V, R_L = 3.75Ω	—	15	—	ns
Rise Time		t_r		—	80	—	ns
Turn-off Delay Time		$t_{d(off)}$		—	100	—	ns
Fall Time		t_f		—	55	—	ns
Body-Drain Diode Forward Voltage		V_{DF}	I_F = 15A, V_{GS} = 0	—	1.05	—	V
Body-Drain Diode Reverse Recovery Time		t_{rr}	I_F = 15A, V_{GS} = 0, di_F/dt = 100A/μs	—	370	—	ns

* Pulse Test

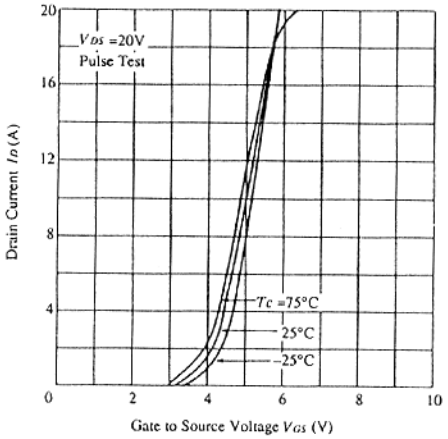
MAXIMUM SAFE OPERATION AREA



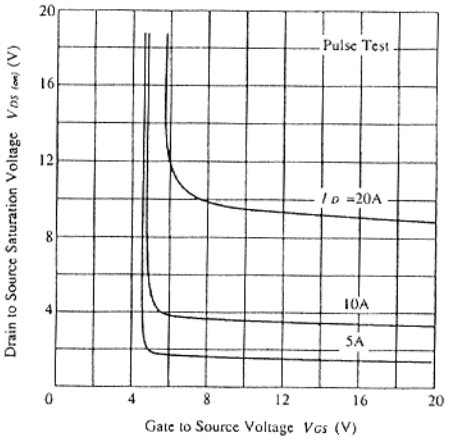
TYPICAL OUTPUT CHARACTERISTICS



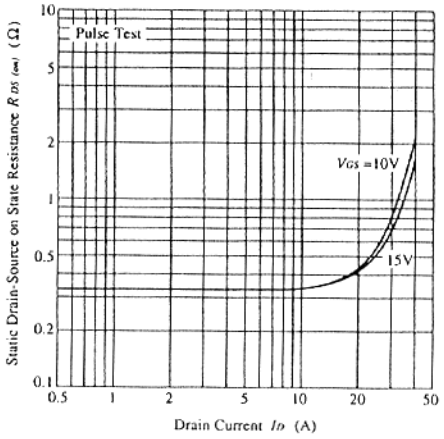
TYPICAL TRANSFER CHARACTERISTICS



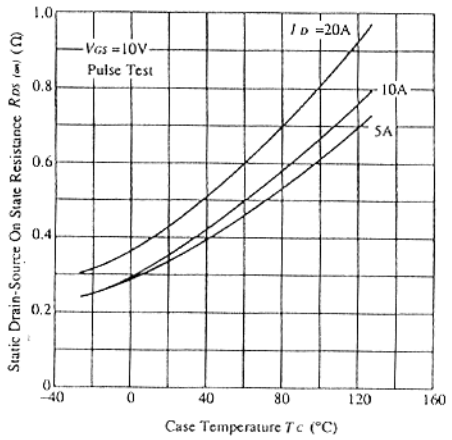
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



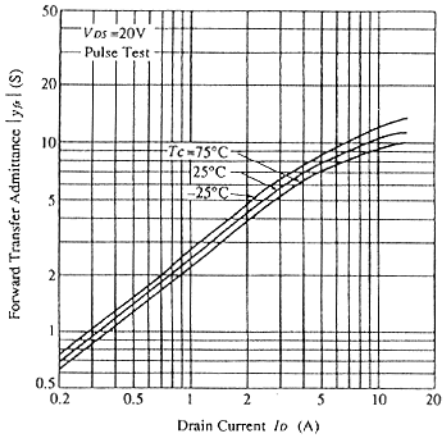
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



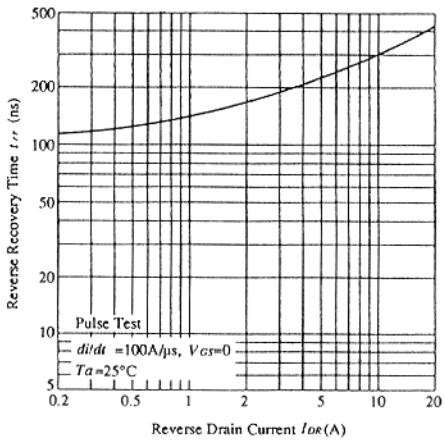
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



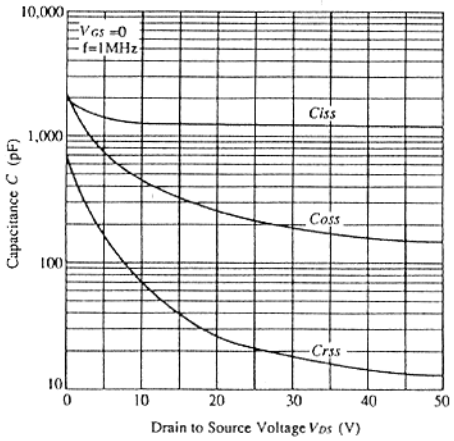
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



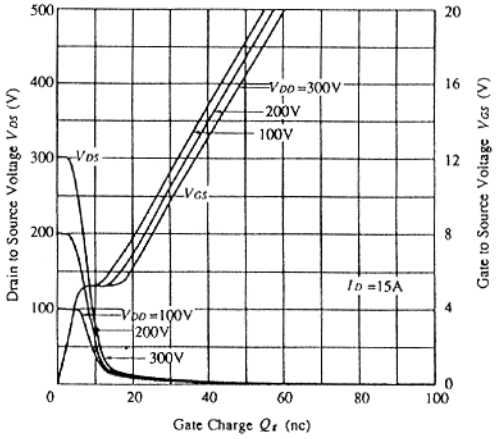
BODY-DRAIN DIODE REVERSE RECOVERY TIME



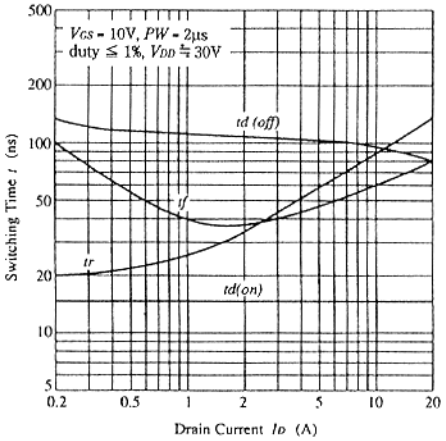
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



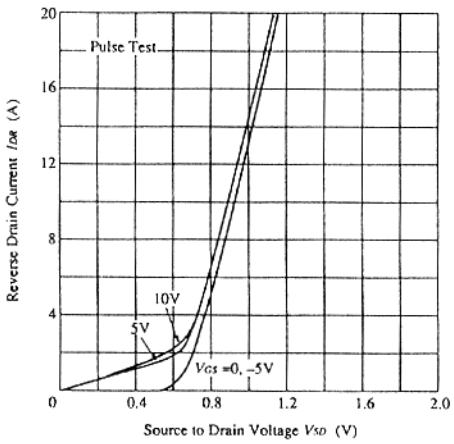
DYNAMIC INPUT CHARACTERISTICS



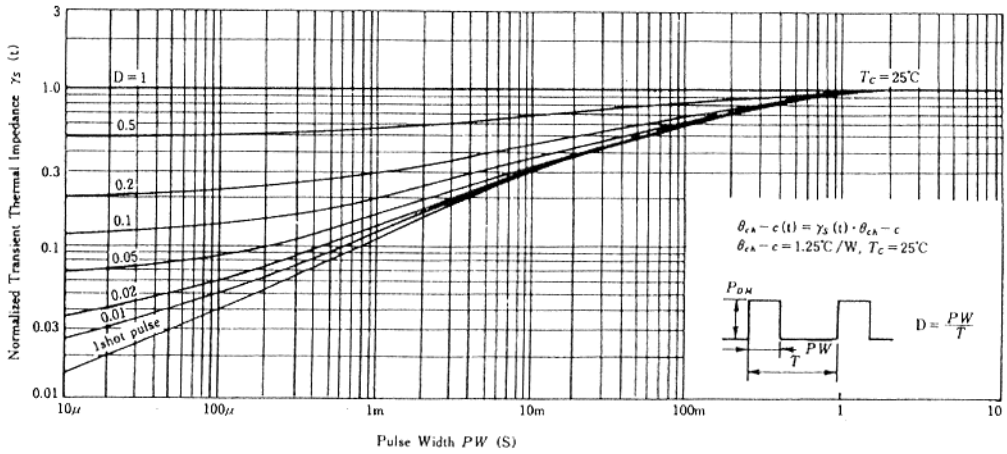
SWITCHING CHARACTERISTICS



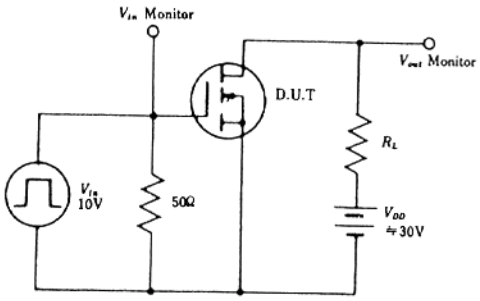
REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS