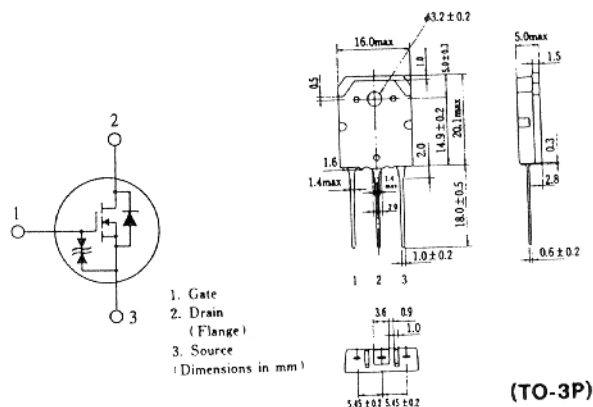


2SK1401, 2SK1401A

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



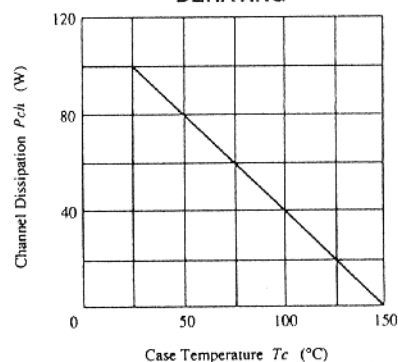
■ ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Item	Symbol	K1401	K1401A	Unit
Drain-Source Voltage	V_{DS}	300	350	V
Gate-Source Voltage	V_{GS}	± 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	T_{ch}	150		$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$		$^\circ\text{C}$

*PW $\leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

**Value at $T_c = 25^\circ\text{C}$

POWER VS. TEMPERATURE DERATING

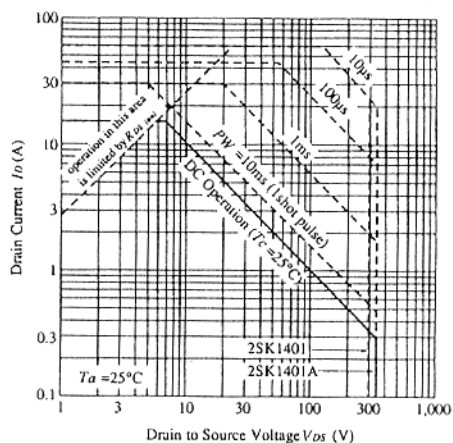


■ ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

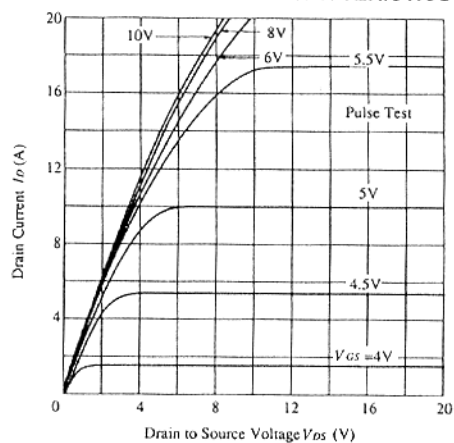
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	K1401 $V_{(BR)DS}$	$I_D = 10\text{mA}, V_{GS} = 0$	300	—	—	V
	K1401A		350	—	—	
Gate-Source Breakdown Voltage	$V_{(BR)GS}$	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$	± 30	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS} = \pm 25\text{V}, V_{DS} = 0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	K1401 I_{DSS}	$V_{DS} = 240\text{V}, V_{GS} = 0$	—	—	250	μA
	K1401A	$V_{DS} = 280\text{V}, V_{GS} = 0$	—	—	—	
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D = 1\text{mA}, V_{DS} = 10\text{V}$	2.0	—	3.0	V
Static Drain-Source on State Resistance	K1401 $R_{DS(on)}$	$I_D = 8\text{A}, V_{GS} = 10\text{V}^*$	—	0.25	0.35	Ω
	K1401A		—	0.30	0.40	
Forward Transfer Admittance	$ y_{fs} $	$I_D = 8\text{A}, V_{DS} = 10\text{V}^*$	6	9.5	—	S
Input Capacitance	C_{iss}	$V_{DS} = 10\text{V}, V_{GS} = 0, f = 1\text{MHz}$	—	1250	—	pF
Output Capacitance	C_{oss}		—	420	—	pF
Reverse Transfer Capacitance	C_{rss}		—	70	—	pF
Turn-on Delay Time	$t_{d(on)}$	$I_D = 8\text{A}, V_{GS} = 10\text{V}, R_L = 3.75 \Omega$	—	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}	$I_F = 15\text{A}, V_{GS} = 0$	—	1.05	—	V
Body-Drain Diode Reverse Recovery Time	t_n	$I_F = 15\text{A}, V_{GS} = 0, di_F/dt = 100\text{A}/\mu\text{s}$	—	370	—	ns

* Pulse Test

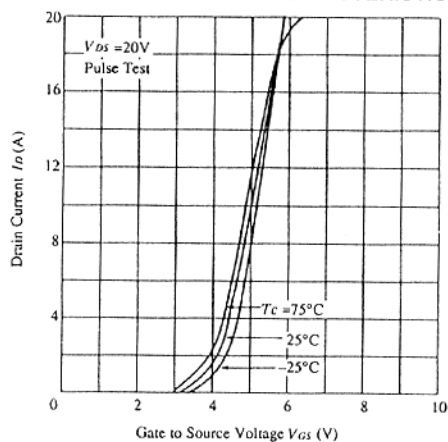
MAXIMUM SAFE OPERATION AREA



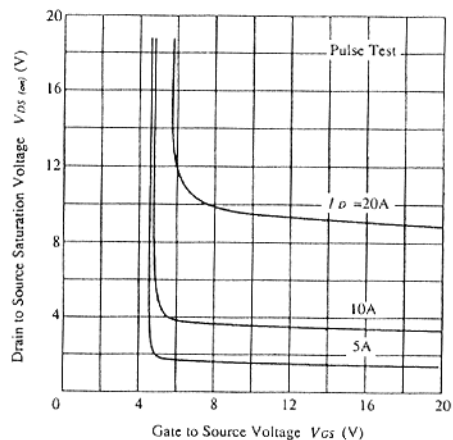
TYPICAL OUTPUT CHARACTERISTICS



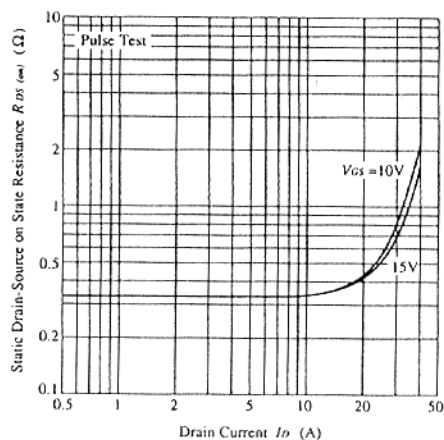
TYPICAL TRANSFER CHARACTERISTICS



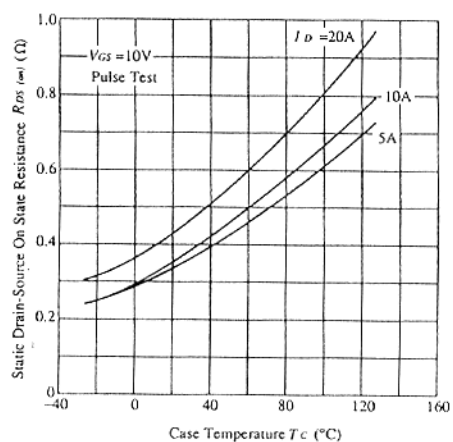
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



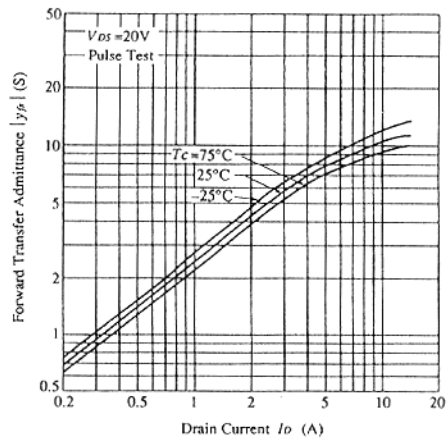
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



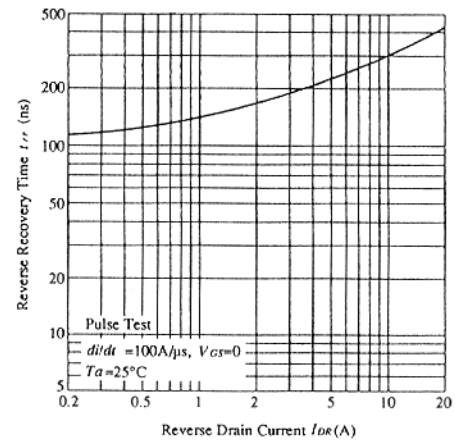
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



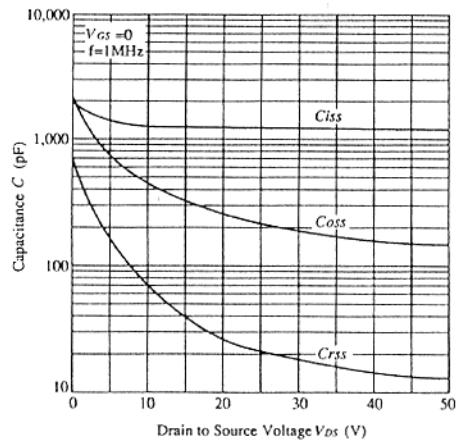
FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT



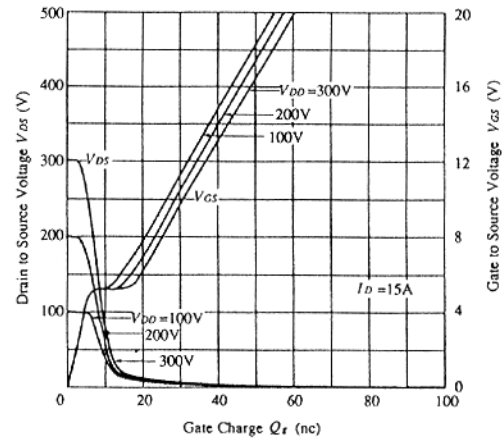
BODY-DRAIN DIODE REVERSE
RECOVERY TIME



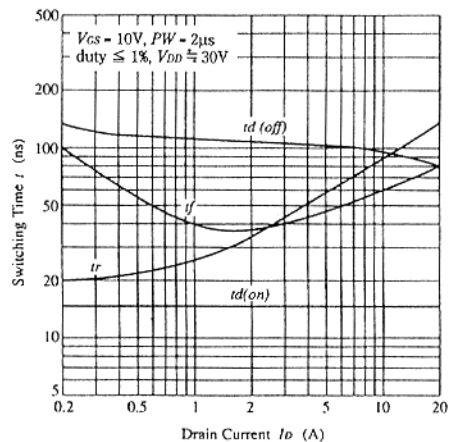
TYPICAL CAPACITANCE
VS. DRAIN-SOURCE VOLTAGE



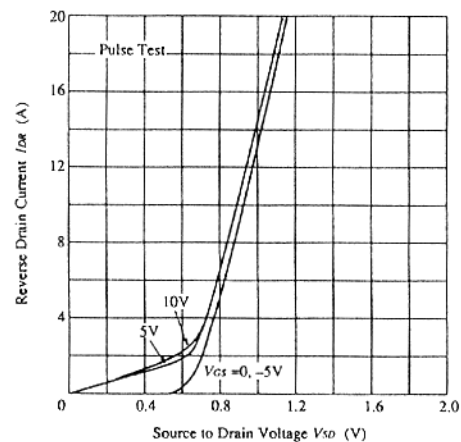
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS

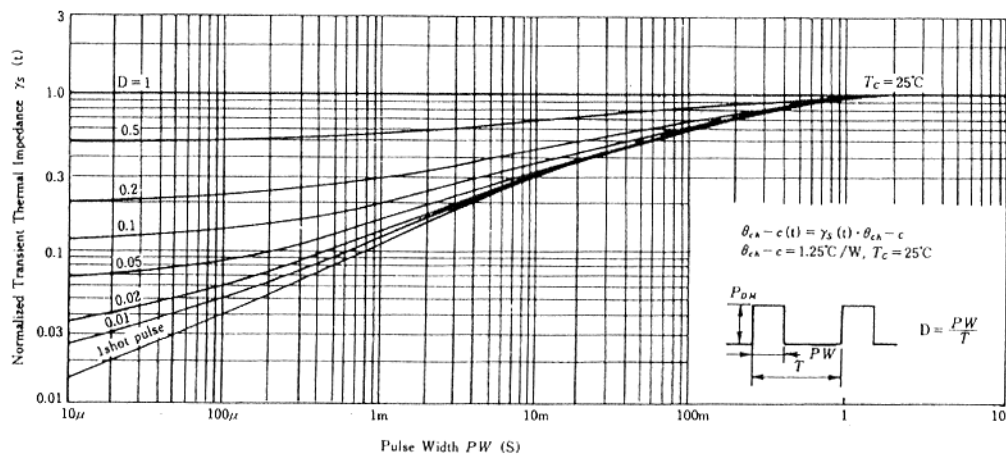


REVERSE DRAIN CURRENT VS.
SOURCE TO DRAIN VOLTAGE

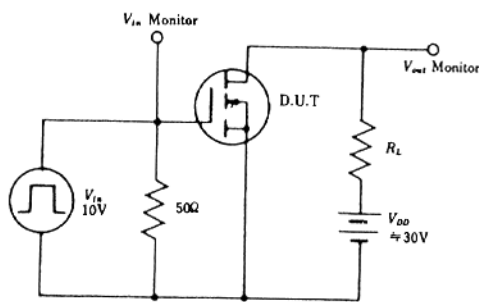


2SK1401,2SK1401A

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

