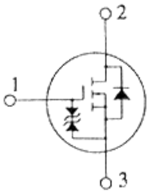
HITACHI

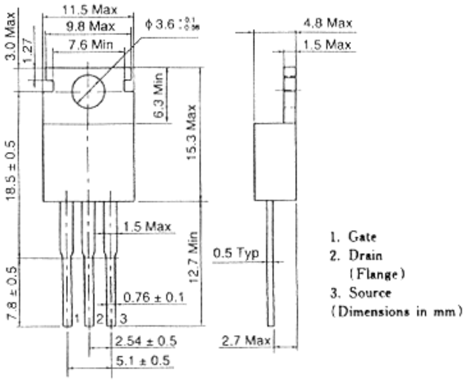
2SK1400,2SK1400A

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





(JEDEC TO-220AB)

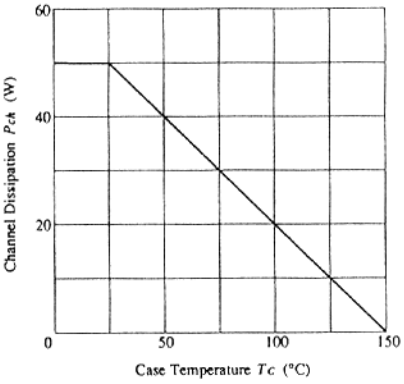
■ABSOLUTE MAXIMUM RATINGS ($Ta = 25$℃)

Item	Symbol	K1400	K1400A	Unit
Drain-Source Voltage	V_{DSS}	300	350	V
Gate-Source Voltage	V_{GSS}	±30		V
Drain Current	I_D	7		A
Drain Peak Current	$I_{D(pulse)}$*	28		A
Body-Drain Diode Reverse Drain Current	I_{DR}	7		A
Channel Dissipation	P_{ch}**	50		W
Channel Temperature	Tch	150		℃
Storage Temperature	$Tstg$	−55〜+150		℃

*PW≦10 μs, duty cycle≦1%

**Value at Tc = 25℃

POWER VS.
TEMPERATURE DERATING

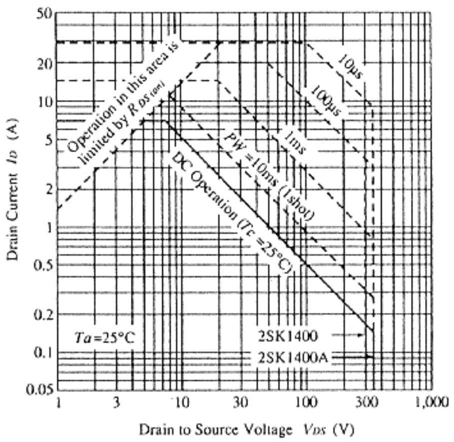


■ELECTRICAL CHARACTERISTICS ($Ta = 25$℃)

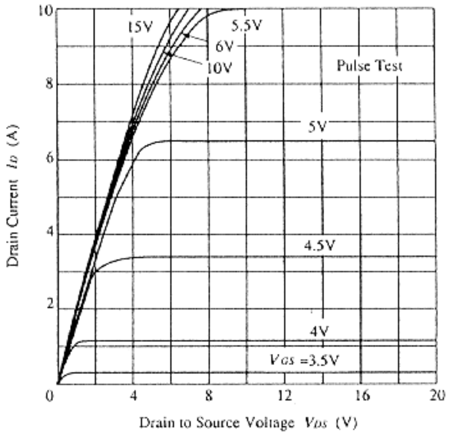
Item		Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	K1400	$V_{(BR)DSS}$	$I_D = 10mA$, $V_{GS} = 0$	300	−	−	V
	K1400A			350	−	−	
Gate-Source Breakdown Voltage		$V_{(BR)GSS}$	$I_G = \pm 100 \mu A$, $V_{DS} = 0$	±30	−	−	V
Gate-Source Leak Current		I_{GSS}	$V_{GS} = \pm 25V$, $V_{DS} = 0$	−	−	±10	μA
Zero Gate Voltage Drain Current	K1400	I_{DSS}	$V_{DS} = 240V$, $V_{GS} = 0$	−	−	250	μA
	K1400A		$V_{DS} = 280V$, $V_{GS} = 0$				
Gate-Source Cutoff Voltage		$V_{GS(off)}$	$I_D = 1mA$, $V_{DS} = 10V$	2.0	−	3.0	V
Static Drain-Source On State Resistance	K1400	$R_{DS(on)}$	$I_D = 4A$, $V_{GS} = 10V$*	−	0.50	0.70	Ω
	K1400A			−	0.60	0.80	
Forward Transfer Admittance		$\lvert y_{fs} \rvert$	$I_D = 4A$, $V_{DS} = 10V$*	3.0	5.0	−	S
Input Capacitance		C_{iss}	$V_{DS} = 10V$, $V_{GS} = 0$, f = 1MHz	−	635	−	pF
Output Capacitance		C_{oss}		−	230	−	pF
Reverse Transfer Capacitance		C_{rss}		−	40	−	pF
Turn-on Delay Time		$t_{d(on)}$	$I_D = 4A$, $V_{GS} = 10V$, $R_L = 7.5\Omega$	−	10	−	ns
Rise Time		t_r		−	50	−	ns
Turn-off Delay Time		$t_{d(off)}$		−	60	−	ns
Fall Time		t_f		−	40	−	ns
Body-Drain Diode Forward Voltage		V_{DF}	$I_F = 7A$, $V_{GS} = 0$	−	1.0	−	V
Body-Drain Diode Reverse Recovery Time		t_{rr}	$I_F = 7A$, $V_{GS} = 0$, $di_F/dt = 100A/\mu s$	−	240	−	ns

* Pulse Test

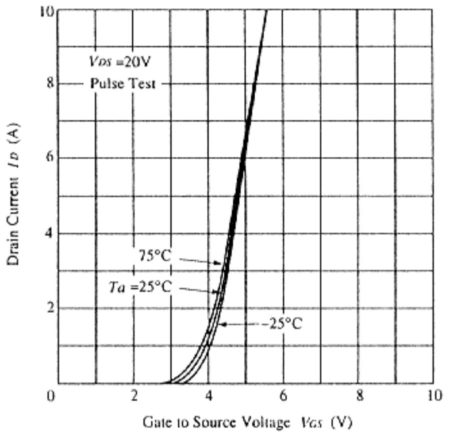
MAXIMUM SAFE OPERATION AREA



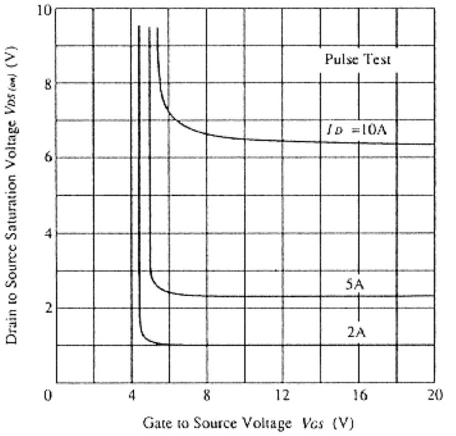
TYPICAL OUTPUT CHARACTERISTICS



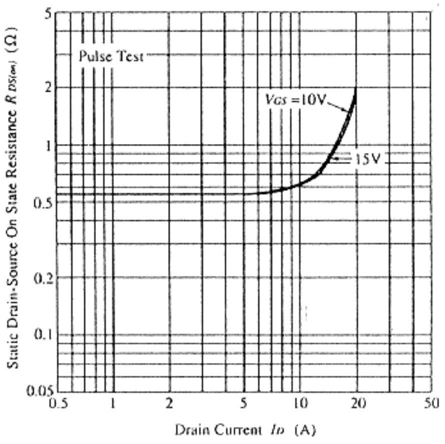
TYPICAL TRANSFER CHARACTERISTICS



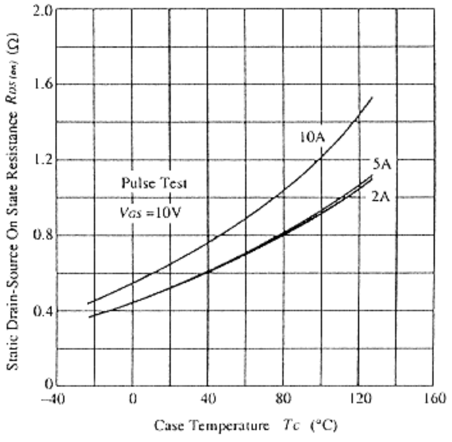
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



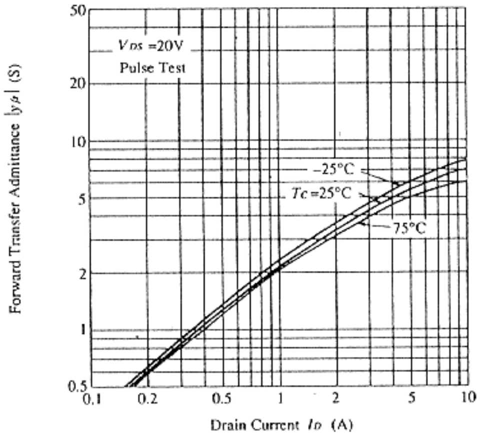
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



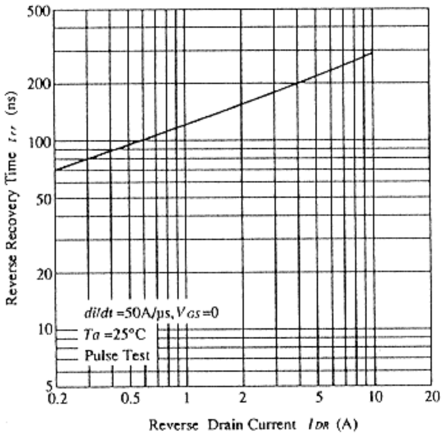
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



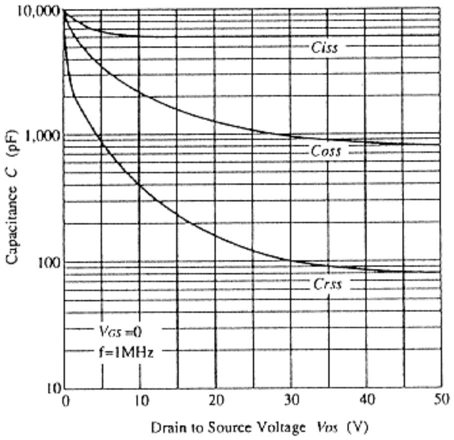
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



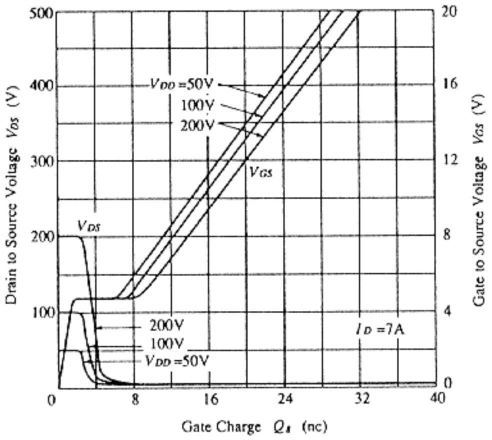
BODY-DRAIN DIODE REVERSE RECOVERY TIME



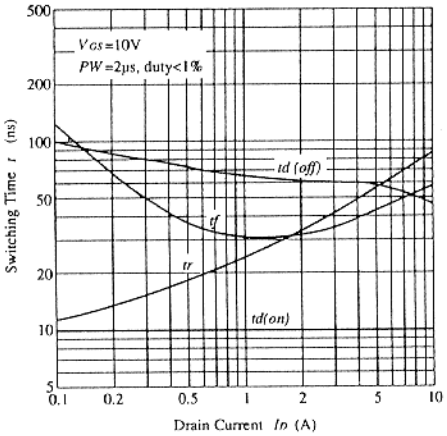
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



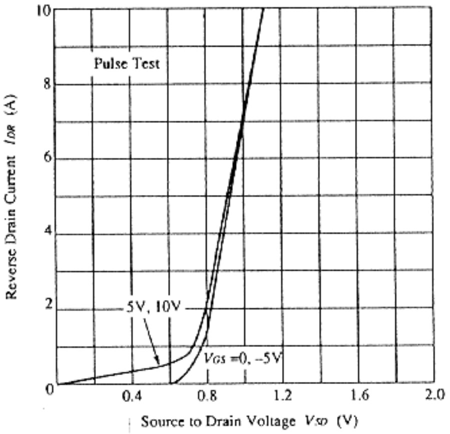
DYNAMIC INPUT CHARACTERISTICS



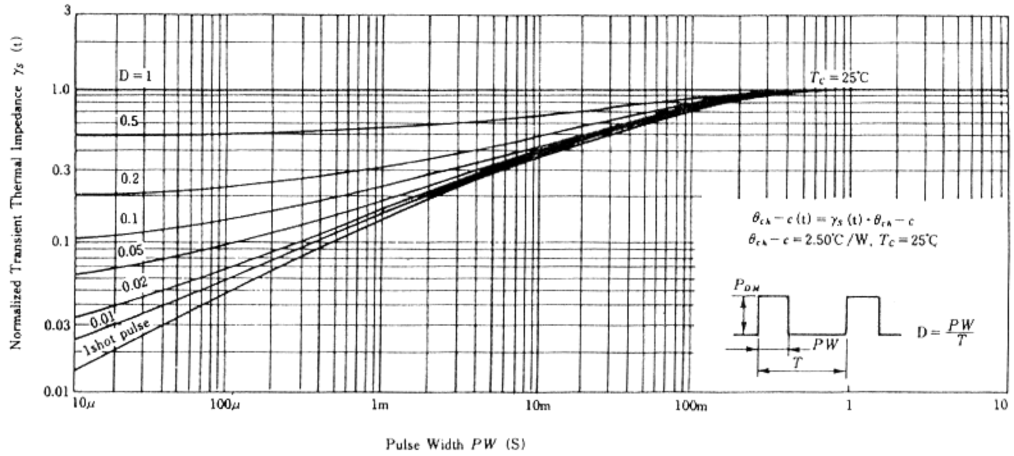
SWITCHING CHARACTERISTICS



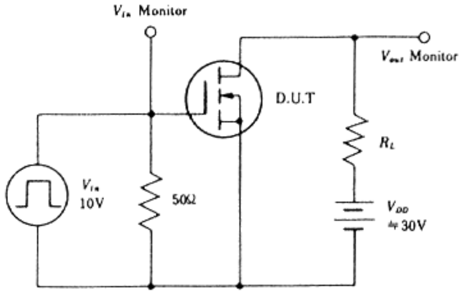
REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS