HITACHI

2SK2059Ⓛ, 2SK2059Ⓢ

Silicon N Channel MOS FET

Application

High speed power switching

Features

- Low on–resistance
- High speed switching
- No Secondary Breakdown
- Suitable for Switching regulator, DC – DC converter

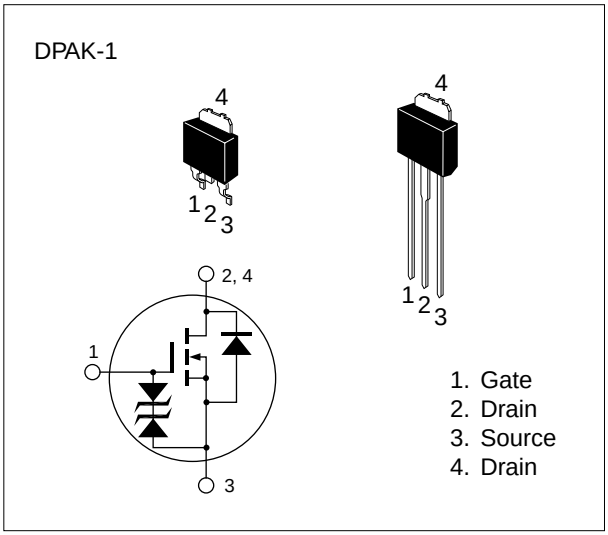


Table 1 Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	600	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	3	A
Drain peak current	$I_{D(pulse)}$*	6	A
Body–drain diode reverse drain current	I_{DR}	3	A
Channel dissipation	Pch**	20	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

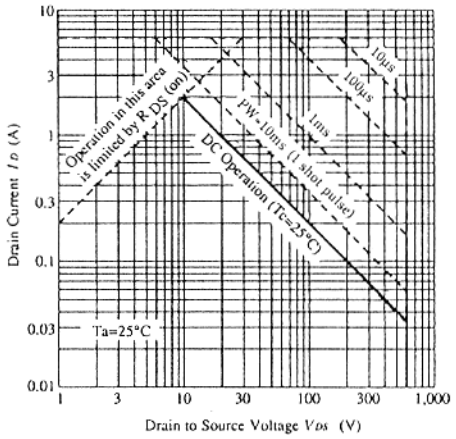
* PW ≤ 10 µs, duty cycle ≤ 1 %
** Value at Tc = 25 °C

Table 2 Electrical Characteristics (Ta = 25°C)

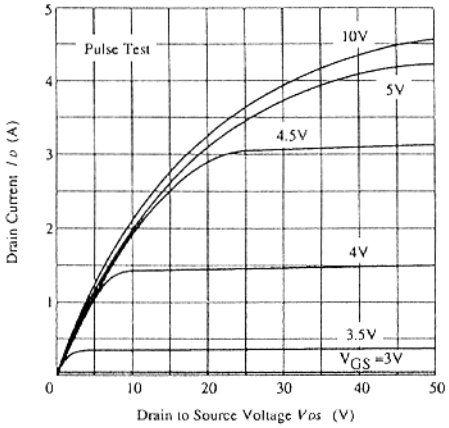
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	100	µA	V_{DS} =500 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	3.8	5.0	Ω	I_D = 2A V_{GS} = 10 V *
Forward transfer admittance	$\|y_{fs}\|$	1.2	2.0	—	S	I_D = 2A V_{DS} = 10 V *
Input capacitance	Ciss	—	295	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	70	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	12	—	pF	f = 1 MHz
Turn–on delay time	$t_{d(on)}$	—	8	—	ns	I_D = 1A
Rise time	t_r	—	25	—	ns	V_{GS} = 10 V
Turn–off delay time	$t_{d(off)}$	—	65	—	ns	R_L = 30Ω
Fall time	t_f	—	30	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F =3 A, V_{GS} = 0
Body–drain diode reverse recovery time	t_{rr}	—	220	—	ns	I_F = 3A, V_{GS} = 0, diF / dt = 100 A / µs

* Pulse Test

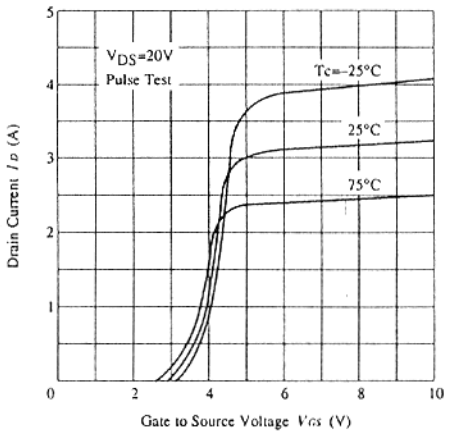
MAXIMUM SAFE OPERATION AREA



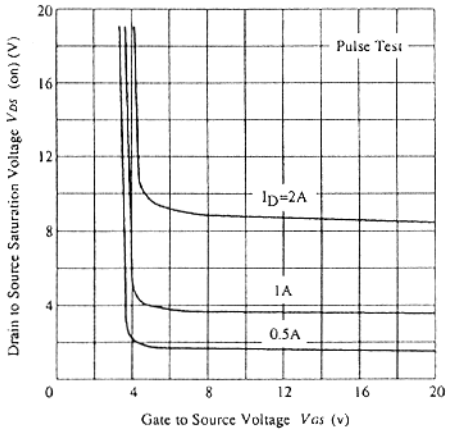
TYPICAL OUTPUT CHARACTERISTICS



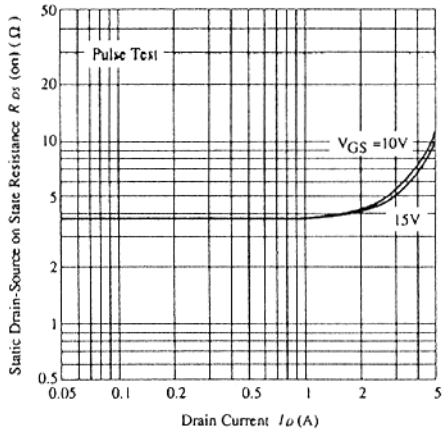
TYPICAL TRANSFER CHARACTERISTICS



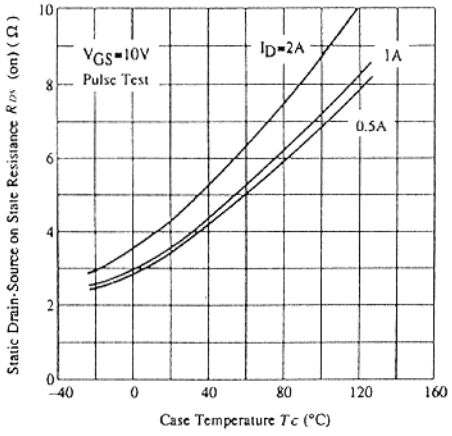
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



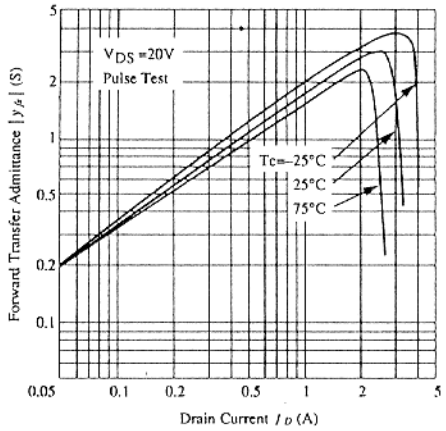
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



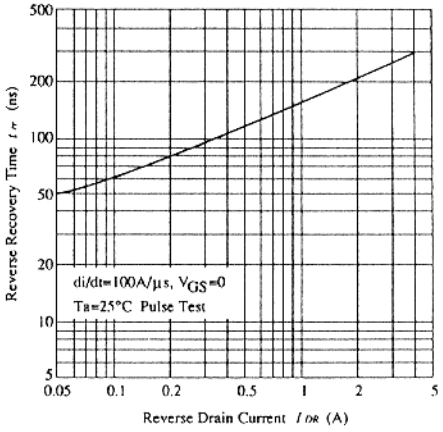
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



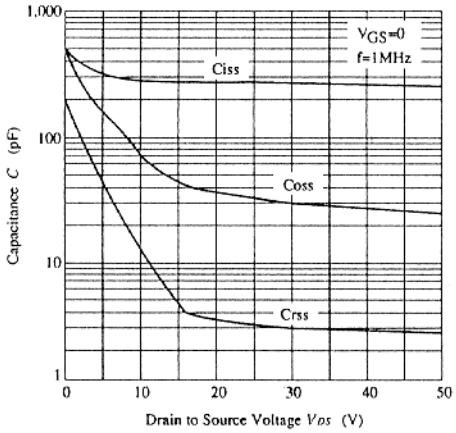
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



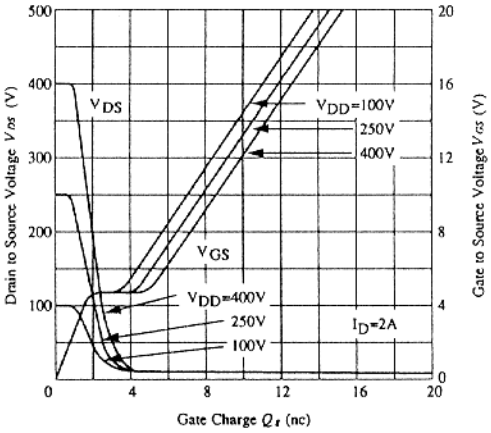
BODY-DRAIN DIODE REVERSE RECOVERY TIME



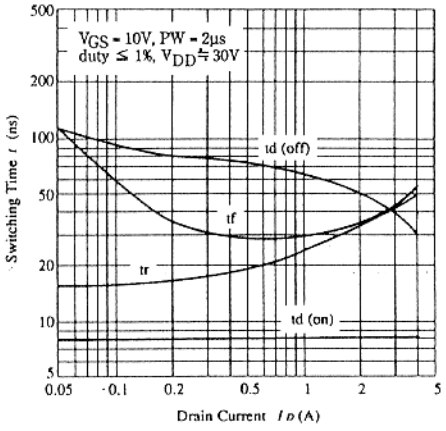
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



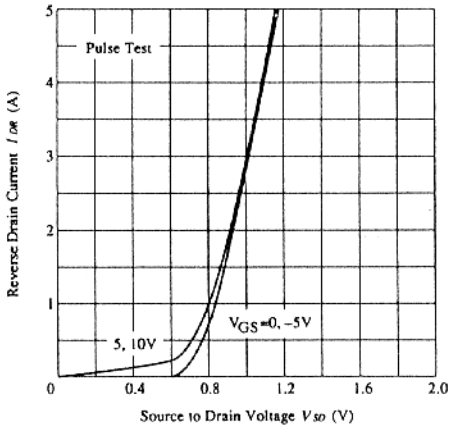
DYNAMIC INPUT CHARACTERISTICS



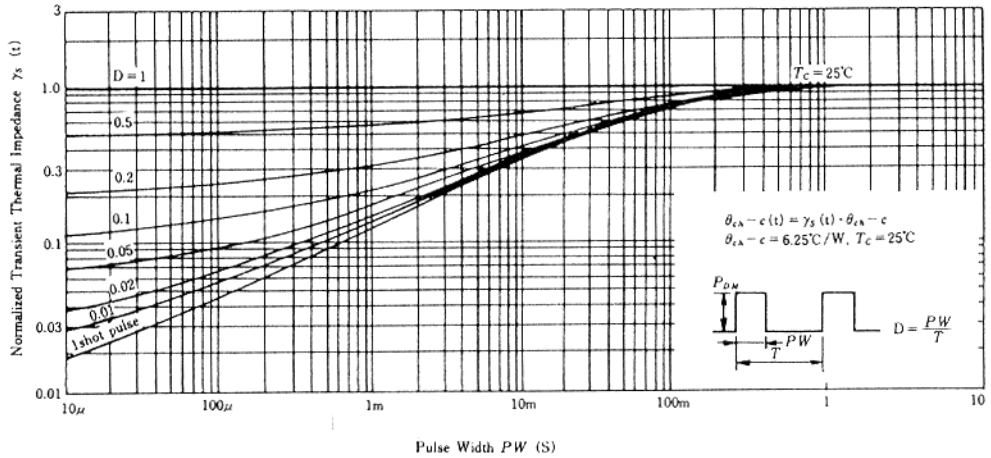
SWITCHING CHARACTERISTICS



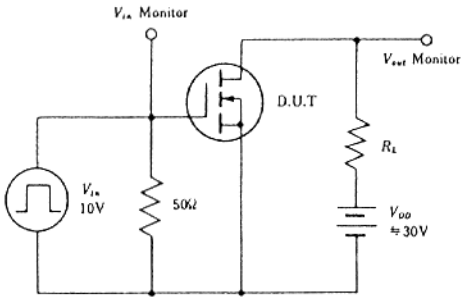
REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS