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# 2SK2059(L), 2SK2059(S)

Silicon N-Channel MOS FET

# HITACHI

November 1996

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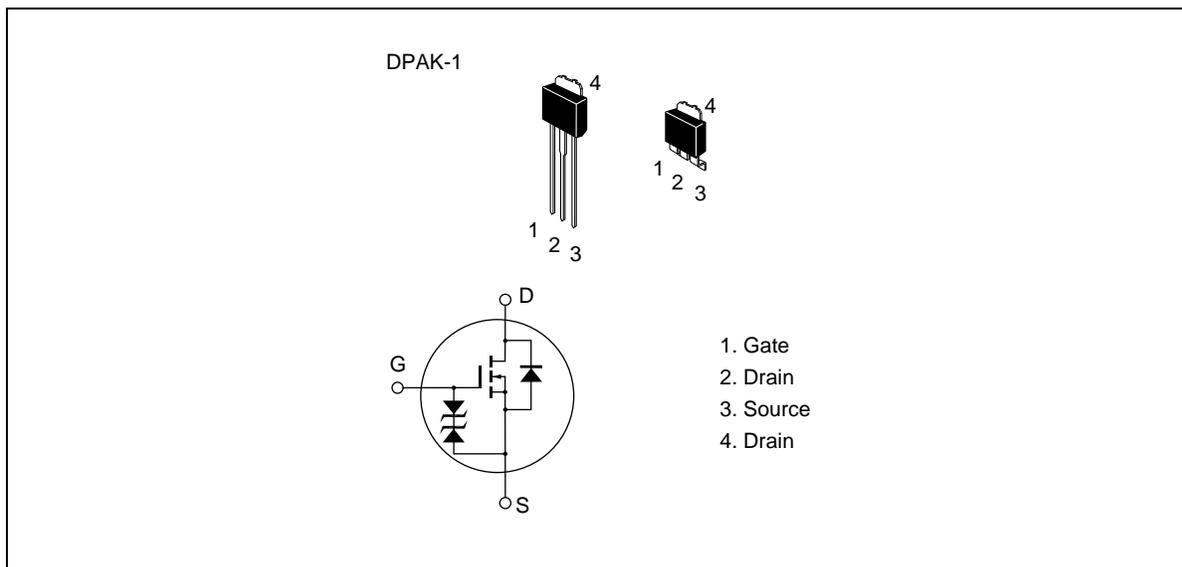
## Application

High speed power switching

## Features

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

## Outline



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### 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	$I_{D(pulse)}^{*1}$	6	A
Body to drain diode reverse drain current	$I_{DR}$	3	A
Channel dissipation	$P_{ch}^{*2}$	20	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  $T_c = 25^\circ C$

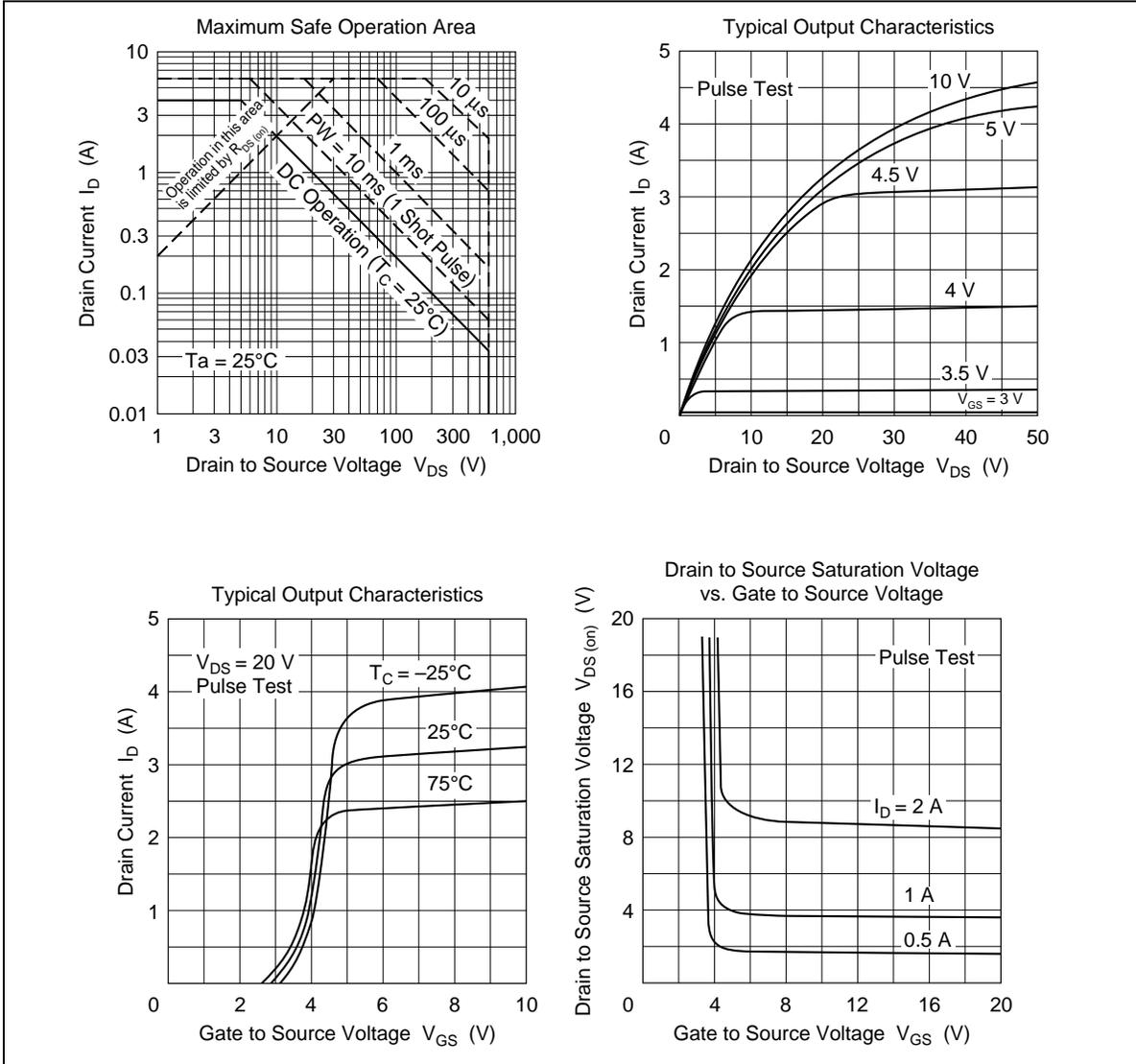
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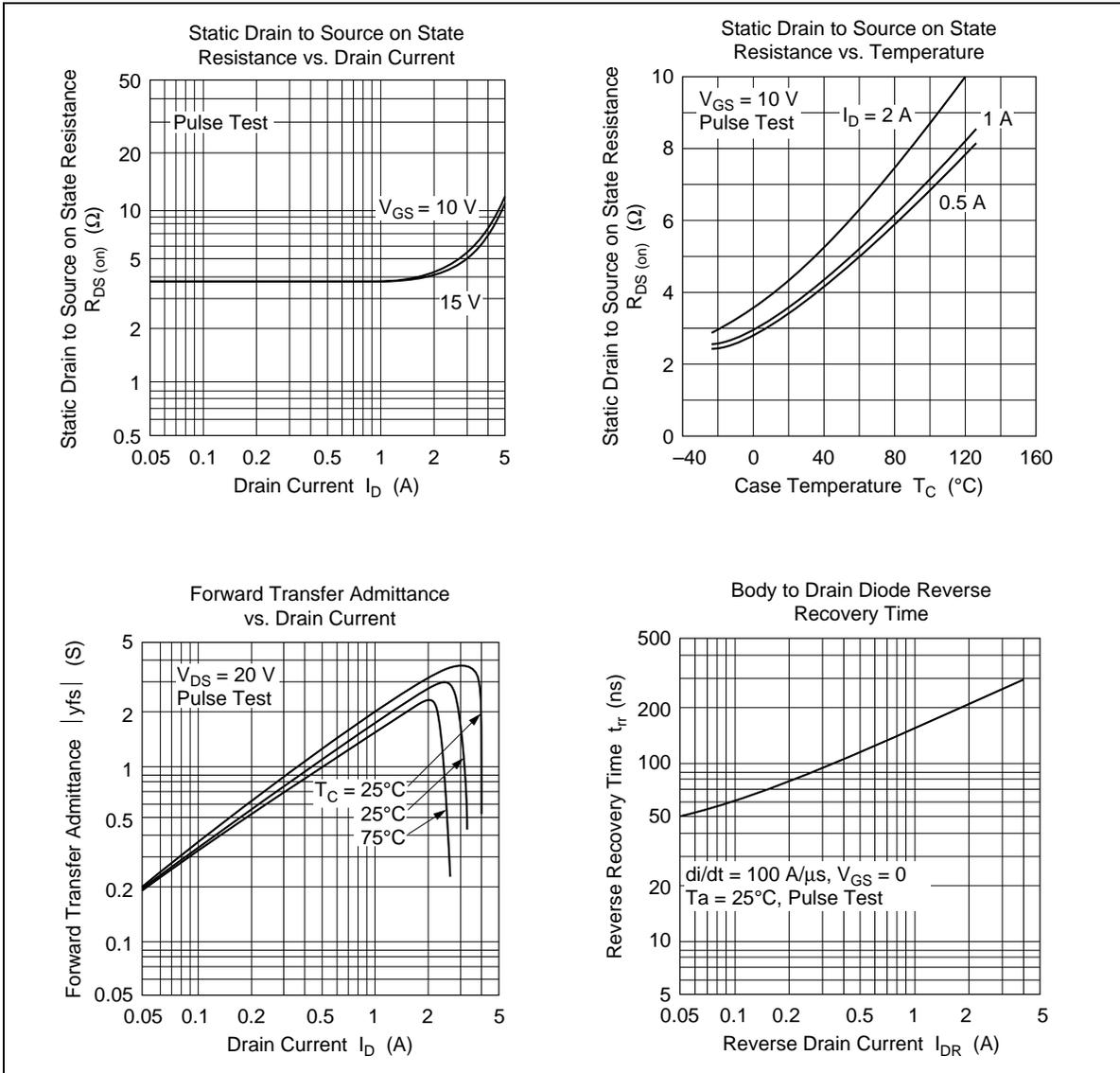
### Electrical Characteristics (Ta = 25°C)

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

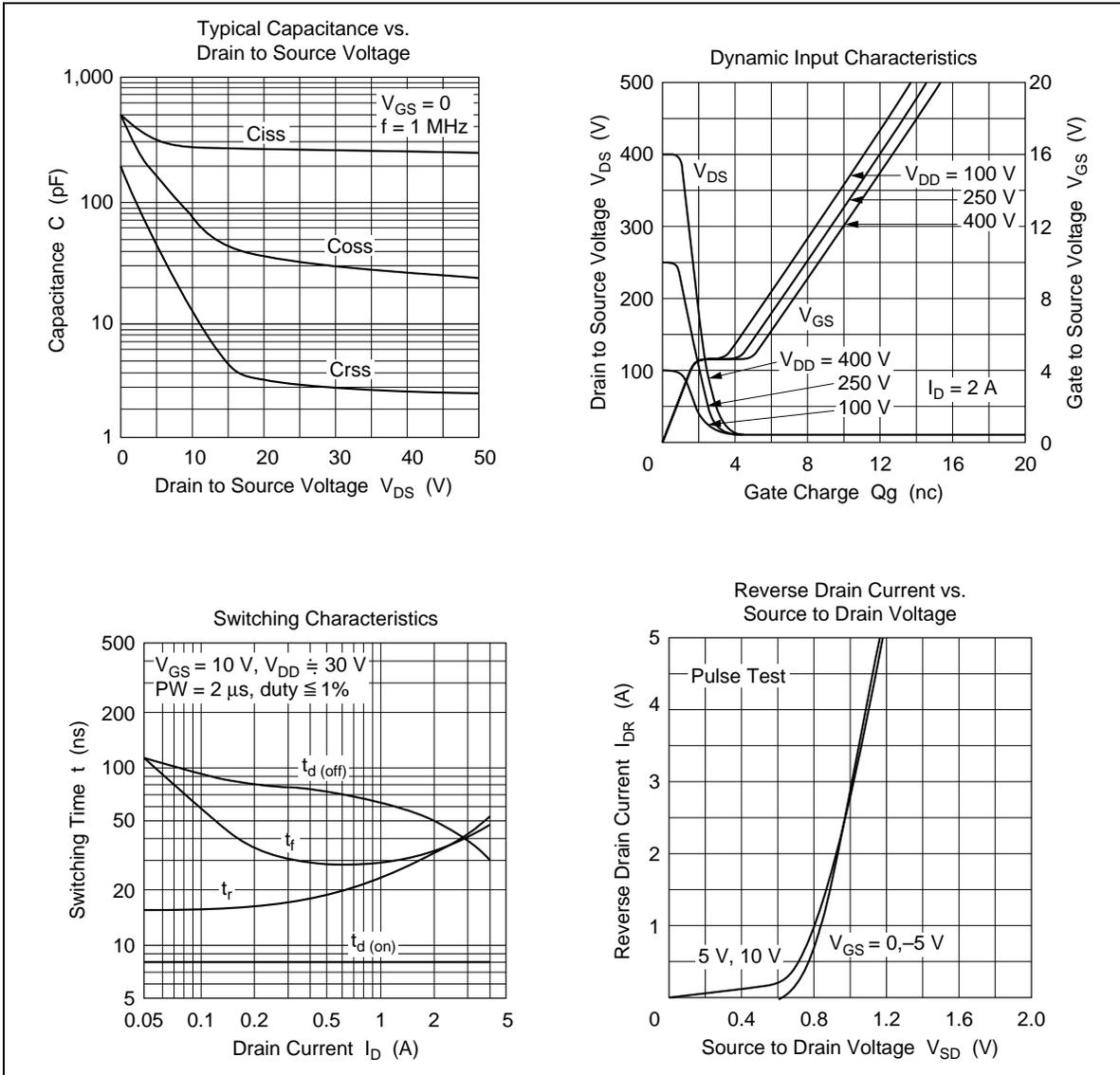
Note 1. Pulse Test

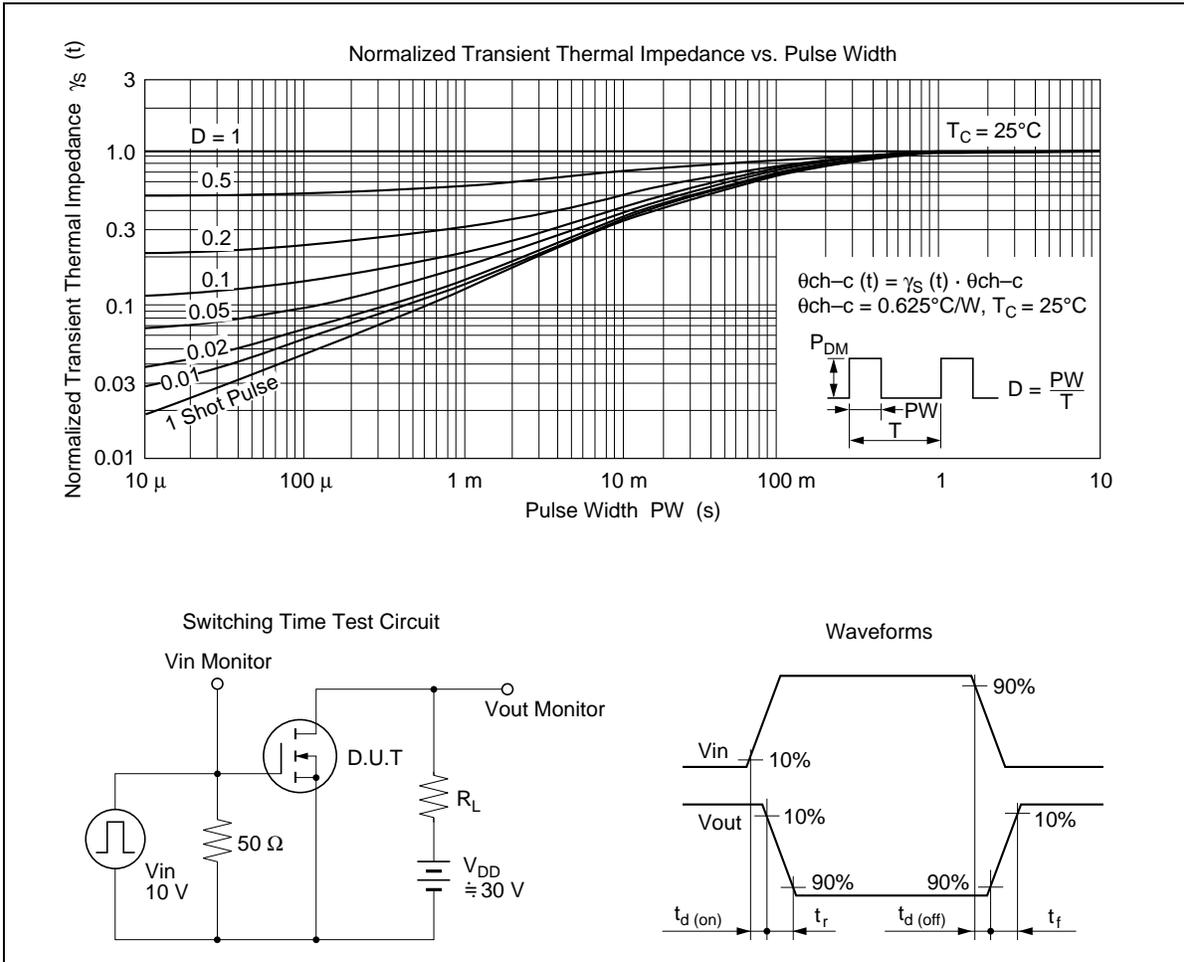
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