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HITACHI/(OPTOELECTRONICS) LLE D

# SILICON N-CHANNEL MOS FET

**2SK399** 

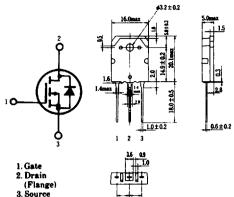
HIGH SPEED POWER SWITCHING, HIGH FREQUENCY POWER AMPLIFIER Complementary pair with 2SJ113

## FEATURES

- Low On-Resistance.
- High Speed Switching.
- High Cutoff Frequency.
- No Secondary Breakdown.
- Suitable for Switching Regulator, DC-DC Converter, Motor Control, and Ultrasonic Power Oscillators.

## ■ ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25 °C)

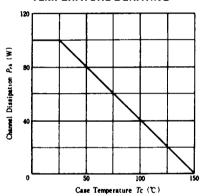
Item	Symbol	Rating	Unit	
Drain-Source Voltage	Voss	100	v	
Gate-Source Voltage	V <sub>GSS</sub>	±20	v	
Drain Current	ID	10	A	
Drain Peak Current	I Dipeak)	15	A	
Body-Drain Diode Reverse Drain Current	IDR	10	A	
Channel Dissipation	P <sub>ch</sub> *	100	w	
Channel Temperature	T <sub>ch</sub>	150	°C	
Storage Temperature	T <sub>sig</sub>	$-55 \sim +150$	°C	



3. Source 5.5 ± 02 5.6 ± 02 (Dimensions in mm) (TO-3P)

POWER VS.

TEMPERATURE DERATING



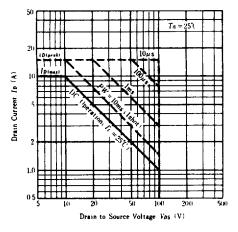
# ■ ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25 °C)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	$I_p=10$ mA, $V_{GS}=0$	100	-	- 1	v
Gate-Source Leak Current	Igss	$V_{GS}=\pm 20$ V, $V_{DS}=0$	-	—	±1	μA
Zero Gate Voltage Drain Current	IDSS	$V_{DS}$ =80V, $V_{GS}$ =0	-	-	1	mA
Gate-Source Cutoff Voltage	V <sub>GRoff</sub>	$l_D = 1$ mA. $V_{DS} = 10$ V	2.0	_	5.0	v
Static Drain-Source On State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =5A, V <sub>GS</sub> =15V*	-	0.20	0.25	ົດ
Drain-Source Saturation Voltage	V <sub>DS(en)</sub>	$I_{D}=5A, V_{cs}=15V^{*}$		1.0	1.25	v
Forward Transfer Admittance	y,d	$I_{D}=5A, V_{DS}=10V^{*}$	1.5	2.0		s
Input Capacitance	C 144	V <sub>D5</sub> =10V. V <sub>G5</sub> =0 f=1MHz		800	—	pF
Output Capacitance	C		_	500	-	pF
Reverse Transfer Capacitance	Crss		_	70	- 1	pF
Turn-on Delay Time	Laton)	$I_{B}$ =2A, $V_{GS}$ =15V $R_{L}$ =15 $\Omega$	-	15	-	ns
Rise Time	t,			35	- 1	ns
Turn-off Delay Time	t <sub>atop</sub> n		_	60	-	ns
Fall Time	t <sub>j</sub>		-	50	- 1	ns
Body-Drain Diode Forward Voltage	V <sub>DF</sub>	$I_F=5A. V_{GS}=0$	- 1	0.9	- 1	v
Body-Drain Diode Reverse Recovery Time	t"	$I_r=5A, V_{cs}=0$ $di_r/dt=50A/\mu s$	-	300	-	ns

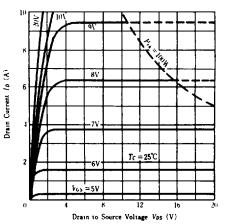
\*Pulse Test

# HITACHI/(OPTOELECTRONICS)

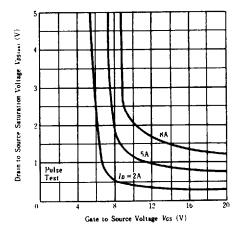
MAXIMUM SAFE OPERATION AREA

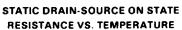


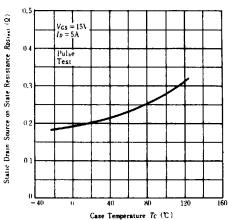
TYPICAL OUTPUT CHARACTERISTICS



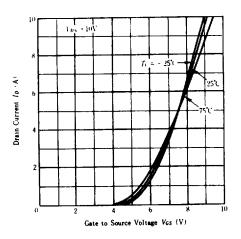
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



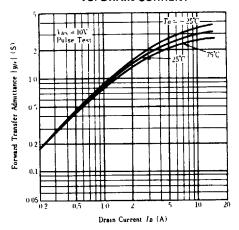




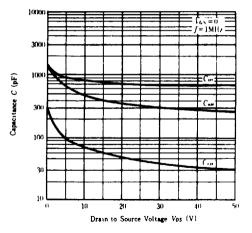
### TYPICAL TRANSFER CHARACTERISTICS



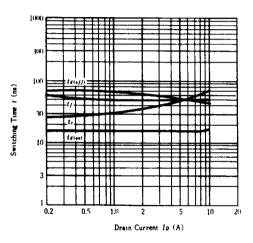




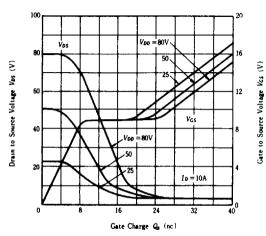
#### TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



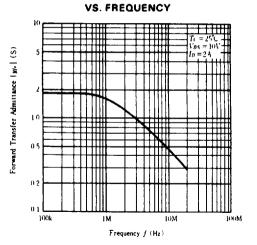
SWITCHING CHARACTERISTICS



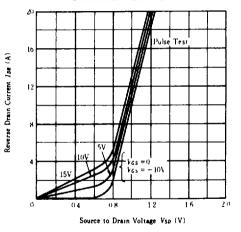
**DYNAMIC INPUT CHARACTERISTICS** 



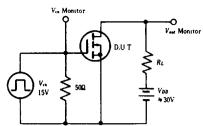
HITACHI/(OPTOELECTRONICS) FORWARD TRANSFER ADMITTANCE



MAXIMUM BODY-DRAIN DIODE FORWARD VOLTAGE



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

