

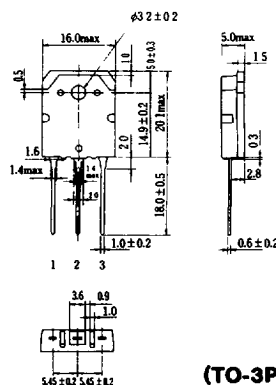
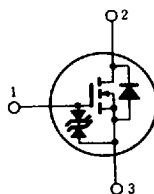
2SK682, 2SK683

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, DC-DC Converter and Motor Driver



1. Gate
2. Drain
(Flange)
3. Source
(Dimensions in mm)

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

Item	Symbol	2SK682	2SK683	Unit
Drain-Source Voltage	V_{DS}	450	500	V
Gate-Source Voltage	V_{GS}	± 20		V
Drain Current	I_D	12		A
Drain Peak Current	$I_{D(pk)}$ *	48		A
Body-Drain Diode Reverse Drain Current	I_{DR}	12		A
Channel Dissipation	P_{ch} **	100		W
Channel Temperature	T_{ch}	150		°C
Storage Temperature	T_{stg}	-55~+150		°C

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

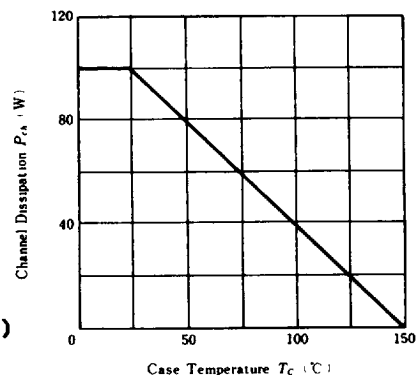
**Value at $T_c = 25^\circ\text{C}$

HITACHI/(OPTOELECTRONICS)

(TO-3P)

POWER VS.

TEMPERATURE DERATING



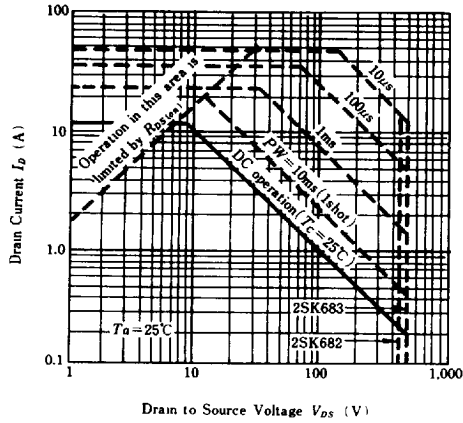
■ ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$)

Item		Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	2SK682	$V_{(BR)DSS}$	$I_D=10\text{mA}, V_{GS}=0$	450	—	—	V
	2SK683			500	—	—	
Gate-Source Breakdown Voltage		$V_{(BR)GSS}$	$I_G=\pm 100\mu\text{A}, V_{DS}=0$	± 20	—	—	V
Gate-Source Leak Current		I_{GSS}	$V_{GS}=\pm 16\text{V}, V_{DS}=0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	2SK682	I_{DSS}	$V_{DS}=360\text{V}, V_{GS}=0$	—	—	250	μA
	2SK683		$V_{DS}=400\text{V}, V_{GS}=0$				
Gate-Source Cutoff Voltage		$V_{GS(off)}$	$I_D=1\text{mA}, V_{DS}=10\text{V}$	2.0	—	4.0	V
Static Drain-Source On State Resistance	2SK682	$R_{DS(on)}$	$I_D=6\text{A}, V_{GS}=10\text{V}^*$	—	0.4	0.55	Ω
	2SK683			—	0.45	0.60	
Forward Transfer Admittance		$ y_{fs} $	$I_D=6\text{A}, V_{DS}=10\text{V}^*$	6	10	—	S
Input Capacitance		C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$	—	2050	—	pF
Output Capacitance		C_{oss}		—	720	—	pF
Reverse Transfer Capacitance		C_{rss}		—	80	—	pF
Turn-on Delay Time		$t_{d(on)}$		—	25	—	ns
Rise Time		t_r	$I_D=6\text{A}, V_{GS}=10\text{V}, R_L=5\Omega$	—	85	—	ns
Turn-off Delay Time		$t_{d(off)}$		—	145	—	ns
Fall Time		t_f		—	85	—	ns
Body-Drain Diode Forward Voltage		V_{DF}	$I_F=12\text{A}, V_{GS}=0$	—	1.0	—	V
Body-Drain Diode Reverse Recovery Time		t_{rr}	$I_F=12\text{A}, V_{GS}=0, dI_F/dt=100\text{A}/\mu\text{s}$	—	120	—	ns

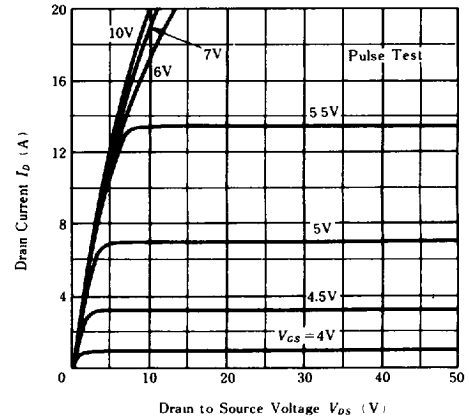
•Pulse Test

HITACHI/(OPTOELECTRONICS)

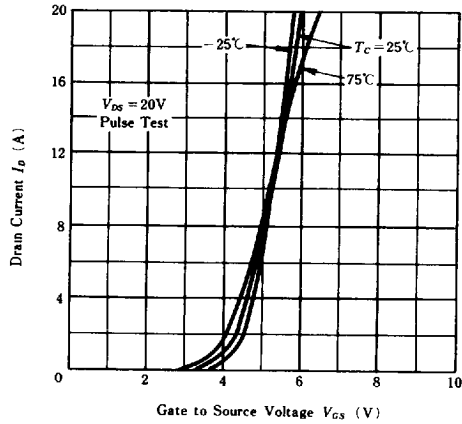
MAXIMUM SAFE OPERATION AREA



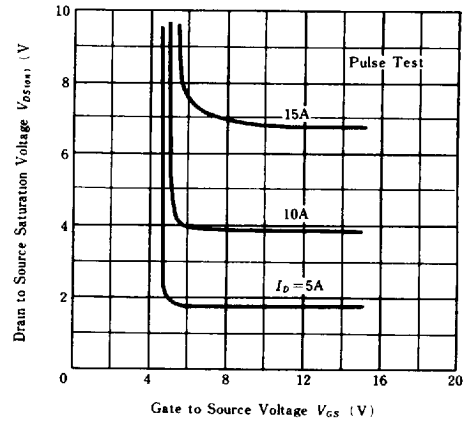
TYPICAL OUTPUT CHARACTERISTICS



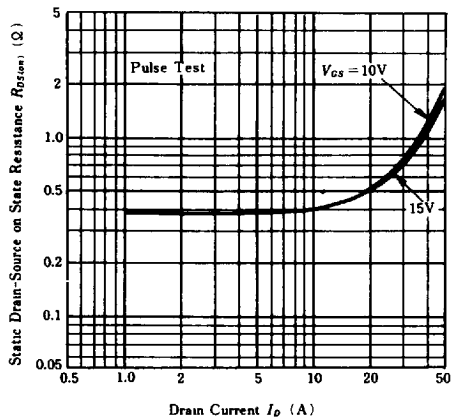
TYPICAL TRANSFER CHARACTERISTICS



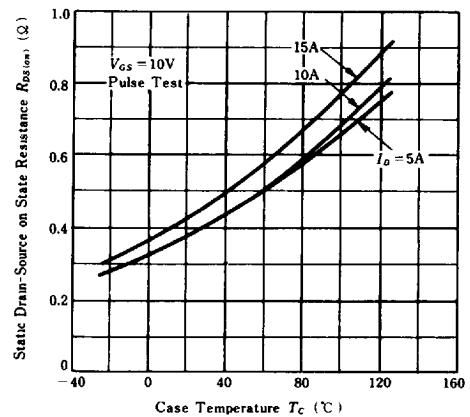
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT

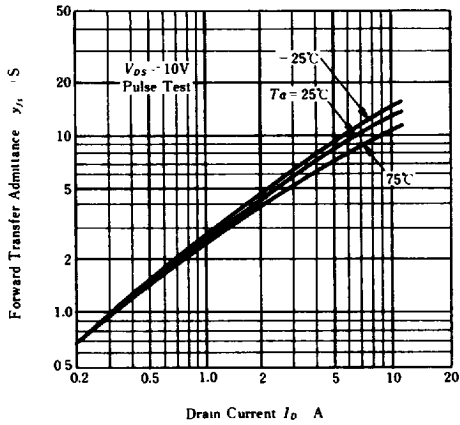


STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE

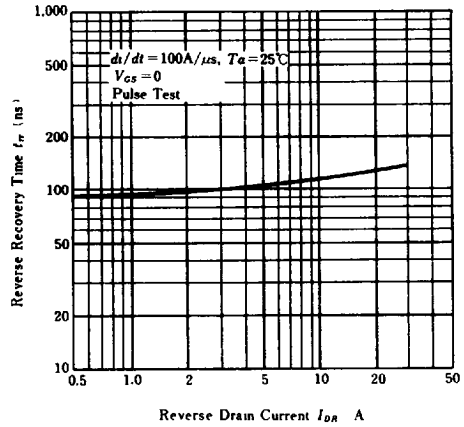


HITACHI/(OPTOELECTRONICS)

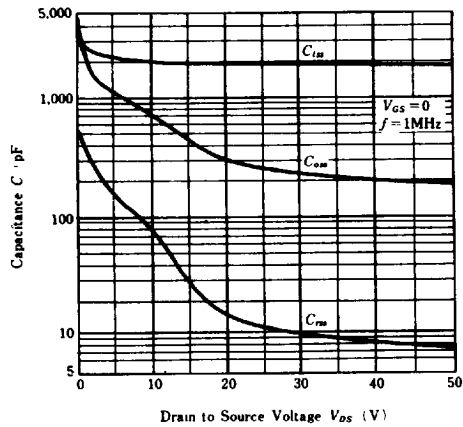
FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT



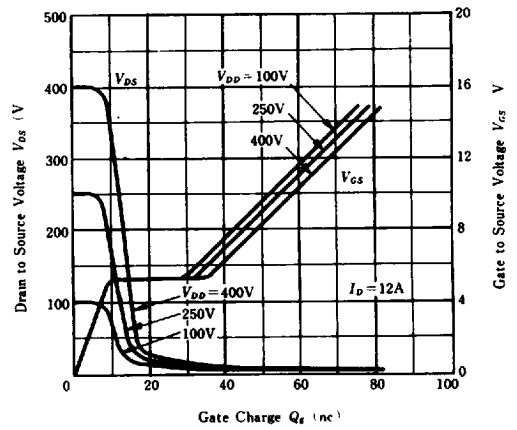
BODY DRAIN DIODE REVERSE
RECOVERY TIME



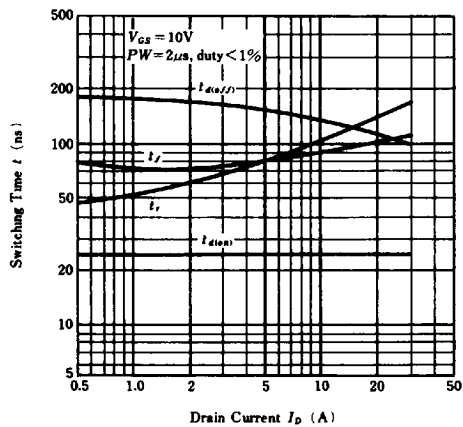
TYPICAL CAPACITANCE
VS. DRAIN-SOURCE VOLTAGE



DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS



REVERSE DRAIN CURRENT VS.
SOURCE TO DRAIN VOLTAGE

