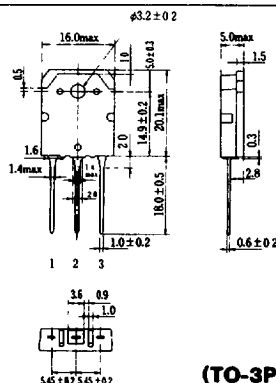
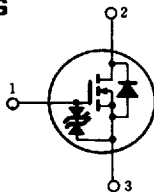


SILICON N-CHANNEL MOS FET HIGH SPEED POWER SWITCHING

■ FEATURES

- Low On-Resistance
- High Speed Switching
- Low Drive Current
- No Secondary Breakdown
- Suitable for Switching Regulator and DC-DC Converter



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

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

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	1000	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	I_D	5	A
Drain Peak Current	$I_{D(pk)}$ *	15	A
Body-Drain Diode Reverse Drain Current	I_{DR}	5	A
Channel Dissipation	P_{ch} **	100	W
Channel Temperature	T_{ca}	150	°C
Storage Temperature	T_{stg}	-55 ~ +150	°C

*PW $\leq 10\mu s$, duty cycle $\leq 1\%$

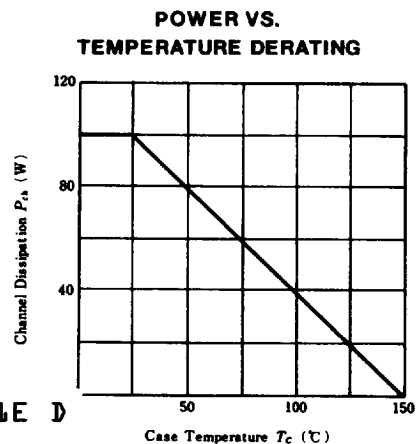
** Value at $T_c \sim 25^\circ\text{C}$

HITACHI/(OPTOELECTRONICS) 61E D

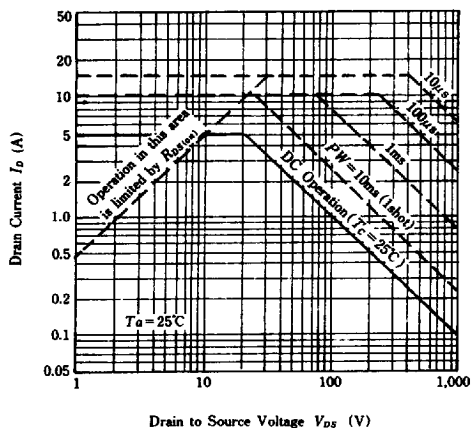
■ ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}, V_{GS}=0$	1000	—	—	V
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	I_{DSS}	$V_{DS}=800\text{V}, V_{GS}=0$	—	—	250	μA
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	$R_{DS(on)}$	$I_D=3\text{A}, V_{GS}=10\text{V}^*$	—	1.5	2.0	Ω
Forward Transfer Admittance	$ y_{fs} $	$I_D=3\text{A}, V_{DS}=20\text{V}^*$	2.0	3.5	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0 \quad f=1\text{MHz}$	—	1800	—	pF
Output Capacitance	C_{oss}		—	1200	—	pF
Reverse Transfer Capacitance	C_{rss}		—	760	—	pF
Turn-On Delay Time	$t_{d(on)}$	$I_D=3\text{A}, V_{GS}=10\text{V}, R_L=10\Omega$	—	25	—	ns
Rise Time	t_r		—	235	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	230	—	ns
Fall Time	t_f		—	200	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F=5\text{A}, V_{GS}=0$	—	0.95	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	$I_F=5\text{A}, V_{GS}=0$ $di_F/dt=100\text{A}/\mu\text{s}$	—	1300	—	ns

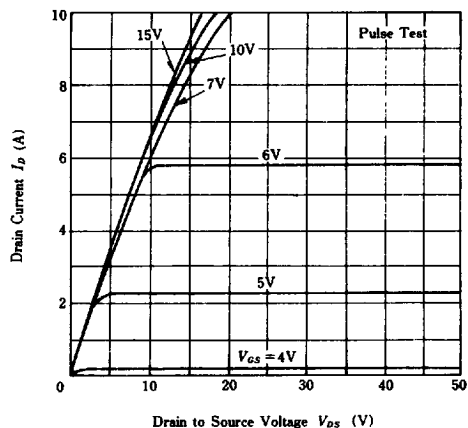
* Pulse Test



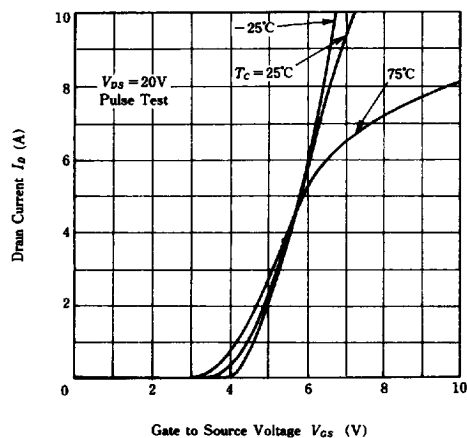
MAXIMUM SAFE OPERATION AREA



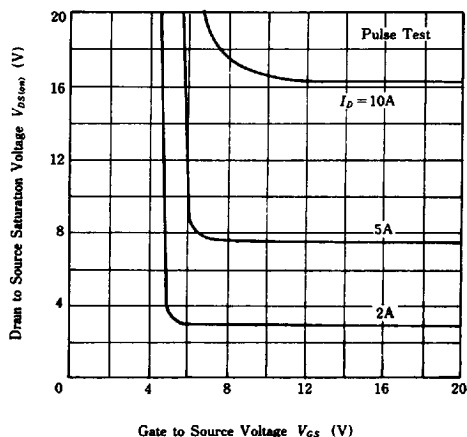
TYPICAL OUTPUT CHARACTERISTICS



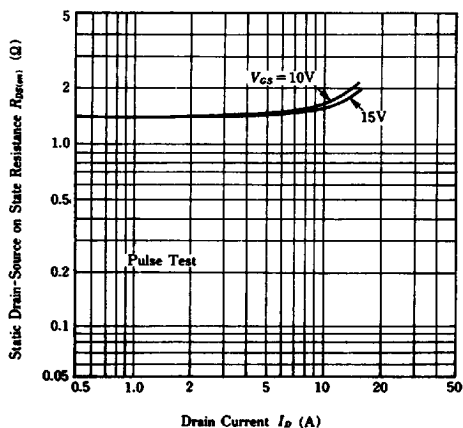
TYPICAL TRANSFER CHARACTERISTICS



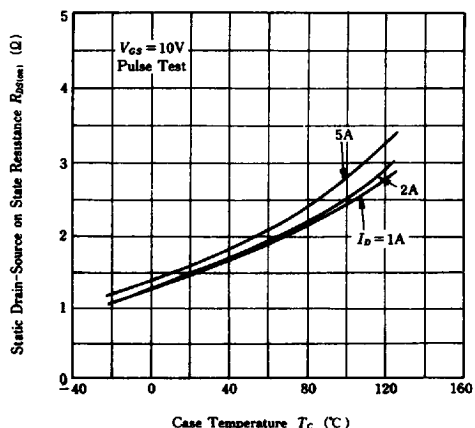
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT

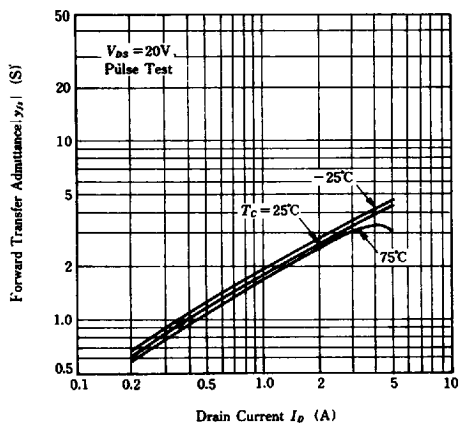


STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE

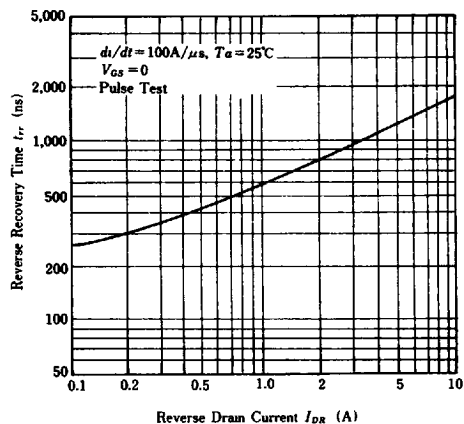


HITACHI/(OPTOELECTRONICS)

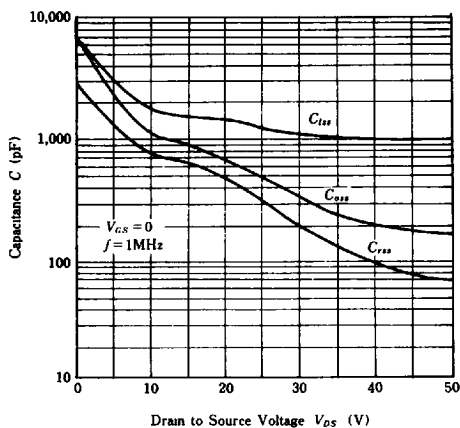
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



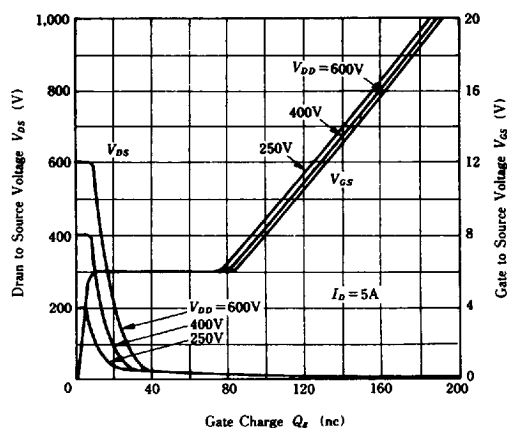
BODY DRAIN DIODE REVERSE RECOVERY TIME



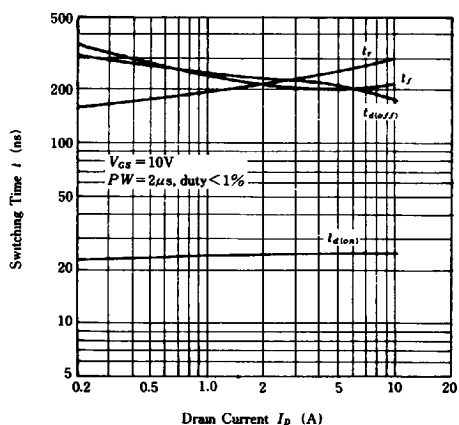
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



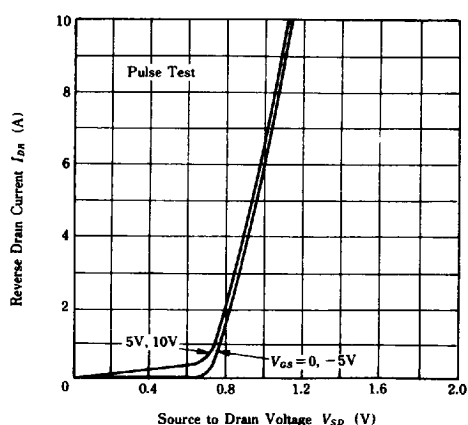
DYNAMIC INPUT CHARACTERISTICS



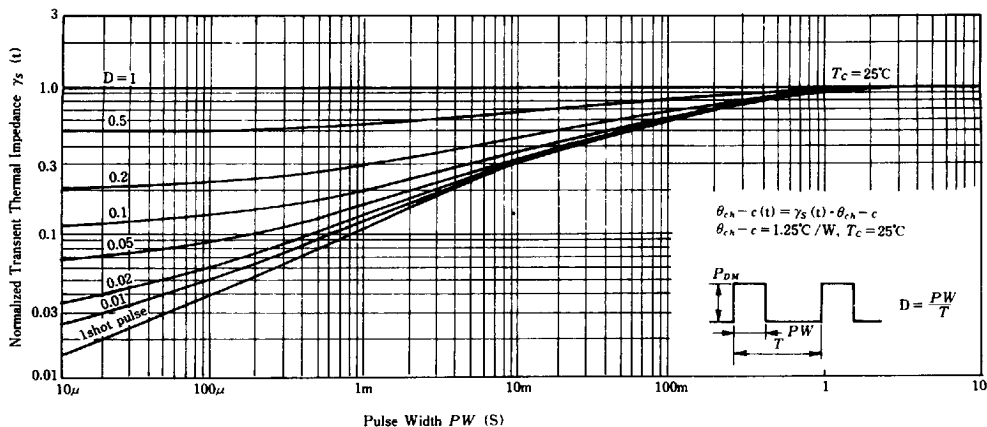
SWITCHING CHARACTERISTICS



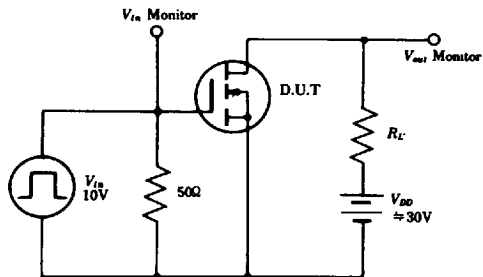
REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

