

4496205 0013261 1T9 HIT4
- HITACHI/(OPTOELECTRONICS) 61E D-

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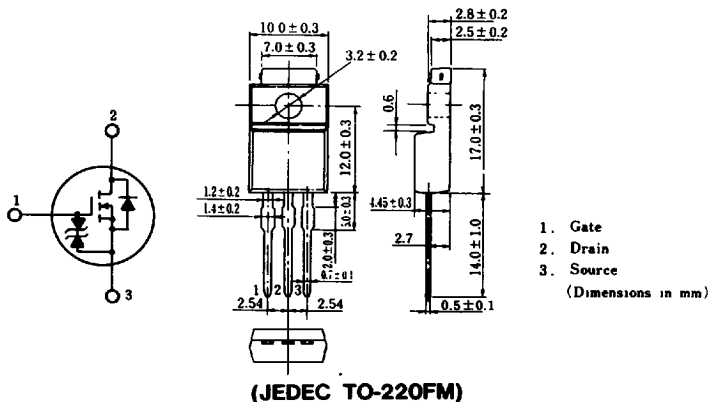
HITACHI/(OPTOELECTRONICS) BLE D-

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



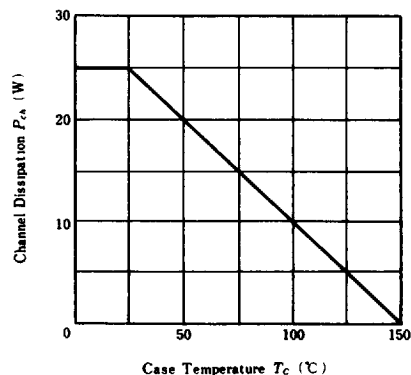
■ **ABSOLUTE MAXIMUM RATINGS** ($T_a=25^{\circ}\text{C}$)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	10	A
Drain Peak Current	$I_{D(pulse)}$ *	40	A
Body-Drain Diode Reverse Drain Current	I_{DR}	10	A
Channel Dissipation	P_{ch} **	25	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 ~ +150	°C

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

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

POWER VS. TEMPERATURE DERATING

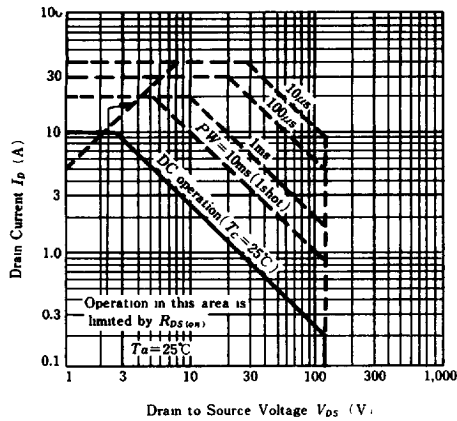


■ ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$)

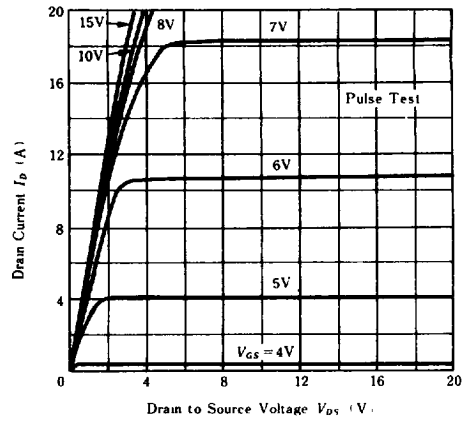
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}, V_{GS}=0$	120	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G=\pm 100\mu\text{A}, V_{DS}=0$	± 20	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS}=\pm 16\text{V}, V_{DS}=0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100\text{V}, V_{GS}=0$	—	—	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	$R_{DS(on)}$	$I_D=5\text{A}, V_{GS}=10\text{V}^*$	—	0.15	0.20	Ω
Forward Transfer Admittance	$ y_{fs} $	$I_D=5\text{A}, V_{DS}=10\text{V}^*$	3.0	5.0	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$	—	730	—	pF
Output Capacitance	C_{oss}		—	330	—	pF
Reverse Transfer Capacitance	C_{rss}		—	40	—	pF
Turn-on Delay Time	$t_{d(on)}$		—	15	—	ns
Rise Time	t_r	$I_D=5\text{A}, V_{GS}=10\text{V}, R_L=6\Omega$	—	40	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	70	—	ns
Fall Time	t_f		—	45	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F=10\text{A}, V_{GS}=0$	—	1.2	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	$I_F=10\text{A}, V_{GS}=0, di/dt=50\text{A}/\mu\text{s}$	—	200	—	ns

•Pulse Test

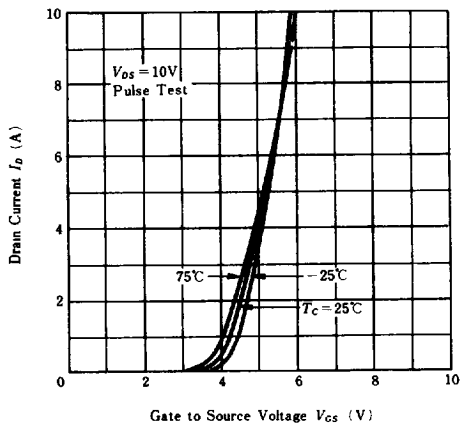
MAXIMUM SAFE OPERATION AREA



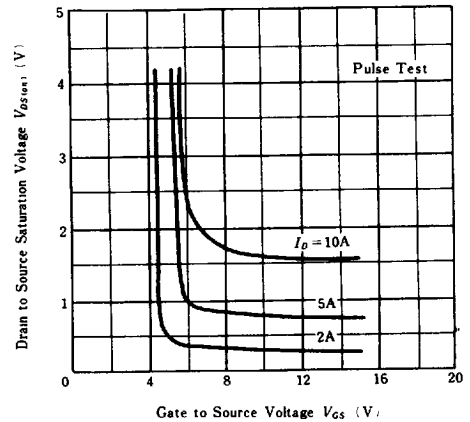
TYPICAL OUTPUT CHARACTERISTICS



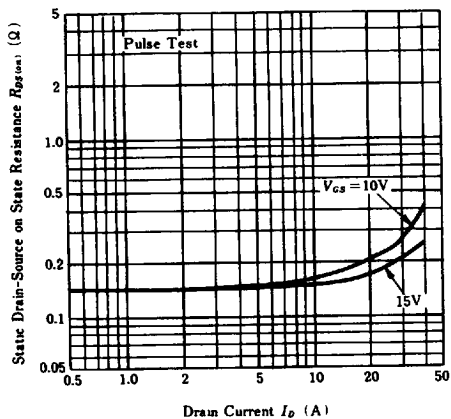
TYPICAL TRANSFER CHARACTERISTICS



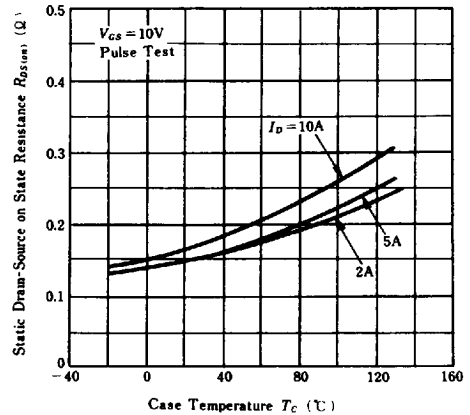
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



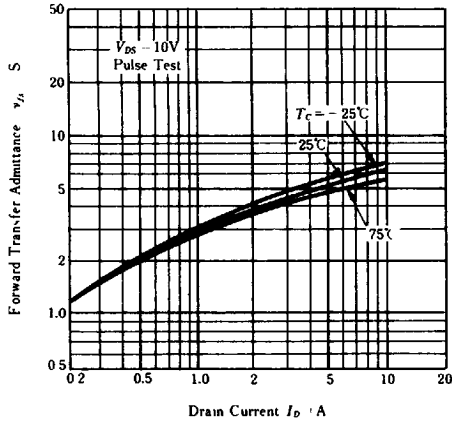
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



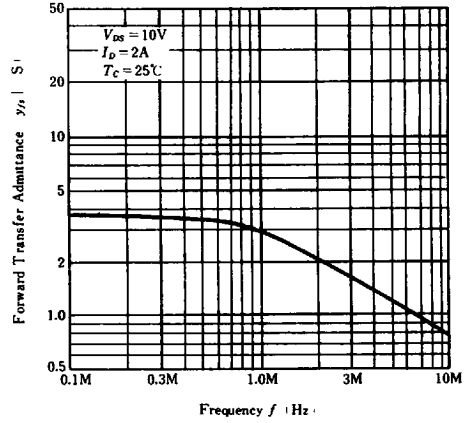
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



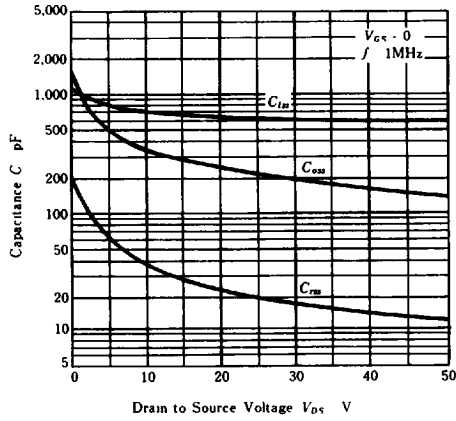
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT**



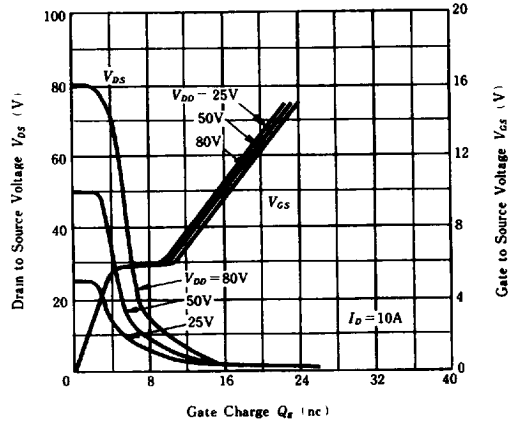
**FORWARD TRANSFER ADMITTANCE
VS. FREQUENCY**



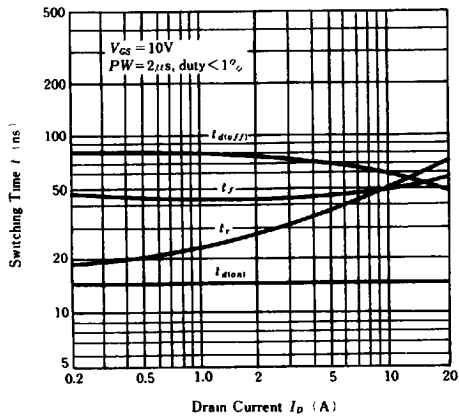
**TYPICAL CAPACITANCE
VS. DRAIN-SOURCE VOLTAGE**



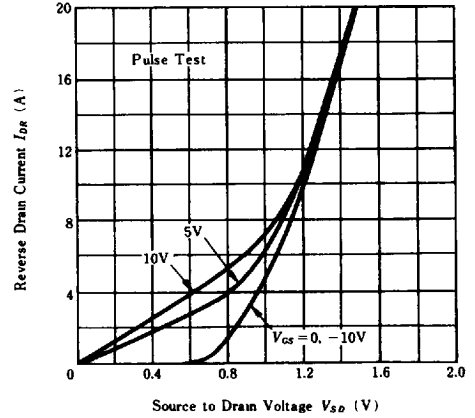
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS

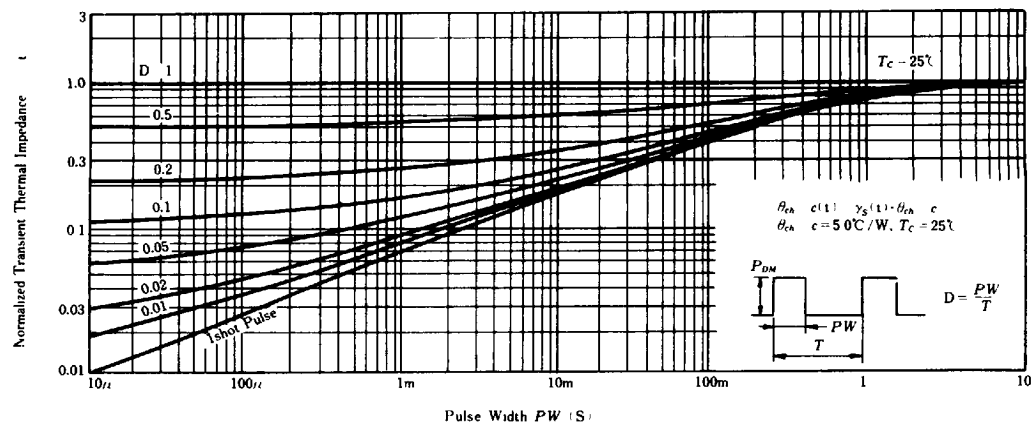


**REVERSE DRAIN CURRENT VS.
SOURCE TO DRAIN VOLTAGE**

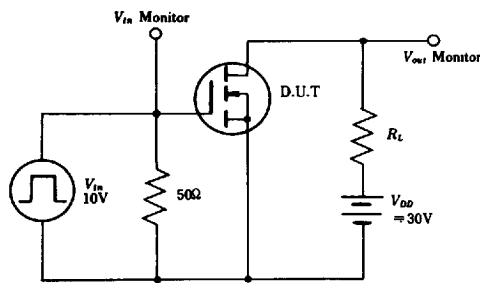


HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

