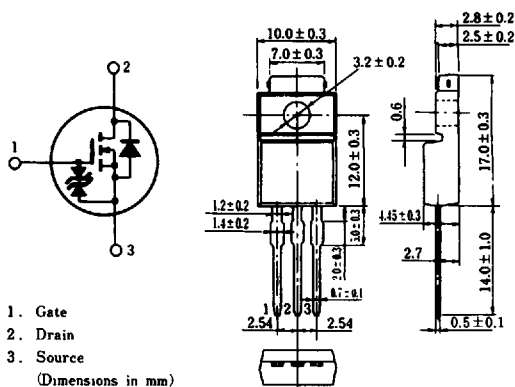


SILICON N-CHANNEL MOS FET HIGH SPEED POWER SWITCHING

■ FEATURES

- Low On-Resistance
- High Speed Switching
- Low Drive Current
- 4 V Gate Drive Device
 - Can be driven from 5 V source
- Suitable for Motor Drive, DC-DC Converter, Power Switch and Solenoid Drive



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

(TO-220FM)

HITACHI/(OPTOELECTRONICS) BLE D

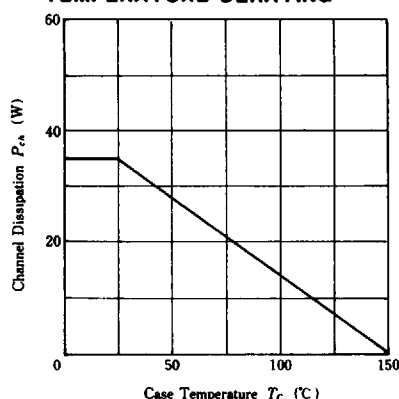
■ ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate- Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	30	A
Drain Peak Current	$I_{D(pulse)}$ *	120	A
Body-Drain Diode Reverse Drain Current	I_{DR}	30	A
Channel Dissipation	P_{ca} **	35	W
Channel Temperature	T_{ca}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim \pm 150$	$^\circ\text{C}$

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

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

POWER VS. TEMPERATURE DERATING

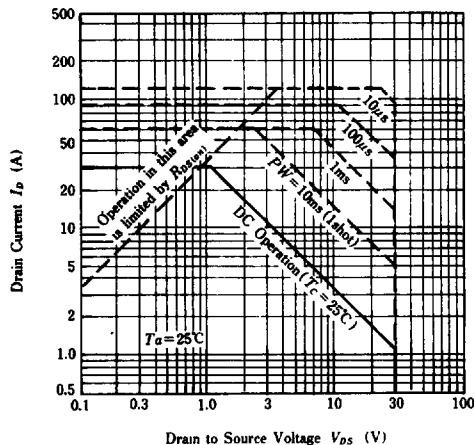


■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

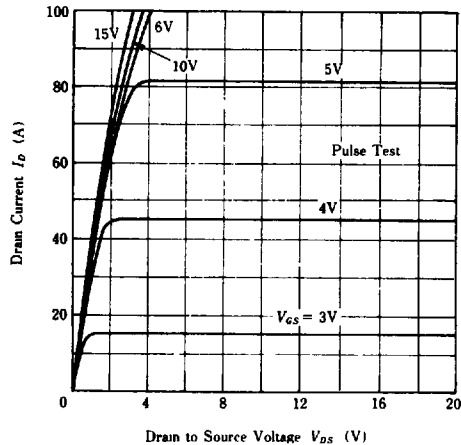
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$I_D=10\text{mA}$, $V_{GS}=0$	30	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GS}$	$I_G=\pm 100\mu\text{A}$, $V_{DS}=0$	± 20	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS}=\pm 16\text{V}$, $V_{DS}=0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=25\text{V}$, $V_{GS}=0$	—	—	250	μA
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D=1\text{mA}$, $V_{DS}=10\text{V}$	1.0	—	2.0	V
Static Drain-Source on State Resistance	$R_{DS(on)}$	$I_D=15\text{A}$, $V_{GS}=10\text{V}$ *	—	0.024	0.030	Ω
		$I_D=15\text{A}$, $V_{GS}=4\text{V}$ *	—	0.035	0.045	
Forward Transfer Admittance	$ y_{fs} $	$I_D=15\text{A}$, $V_{DS}=10\text{V}$ *	13	22	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$, $V_{GS}=0$, $f=1\text{MHz}$	—	1900	—	pF
Output Capacitance	C_{oss}		—	1250	—	pF
Reverse Transfer Capacitance	C_{rss}		—	390	—	pF
Turn-on Delay Time	$t_{d(on)}$	$I_D=15\text{A}$, $V_{GS}=10\text{V}$, $R_L=2\Omega$	—	15	—	ns
Rise Time	t_r		—	140	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	400	—	ns
Fall Time	t_f		—	300	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F=30\text{A}$, $V_{GS}=0$	—	1.2	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	$I_F=30\text{A}$, $V_{GS}=0$, $di_F/dt=50\text{A}/\mu\text{s}$	—	140	—	ns

* Pulse Test

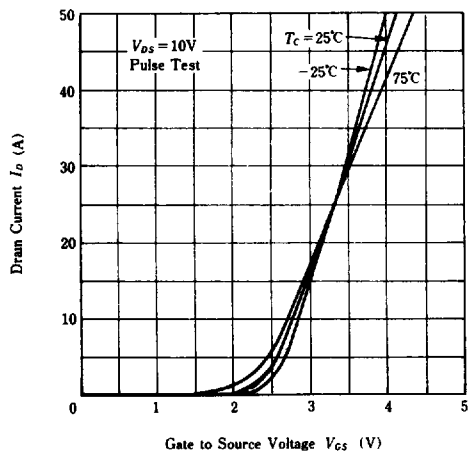
MAXIMUM SAFE OPERATION AREA



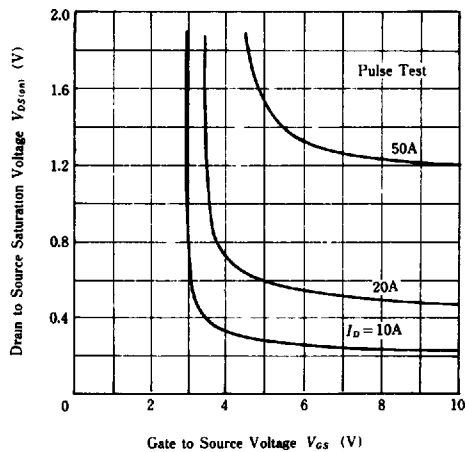
TYPICAL OUTPUT CHARACTERISTICS



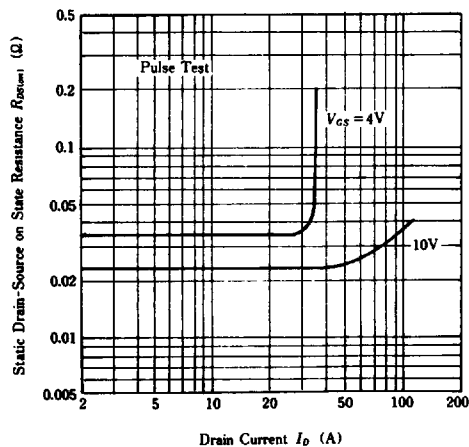
TYPICAL TRANSFER CHARACTERISTICS



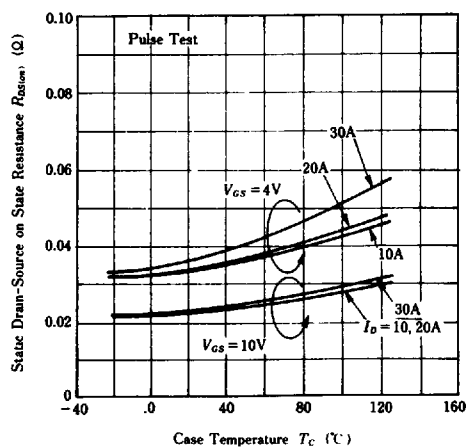
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



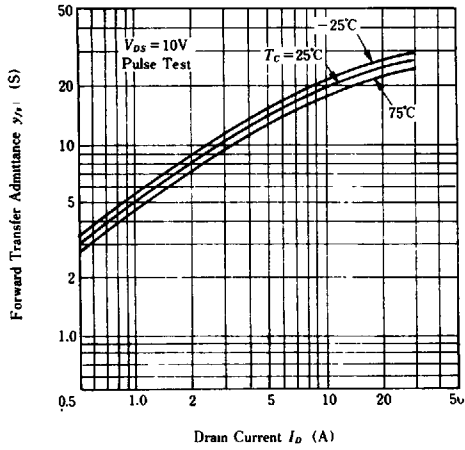
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



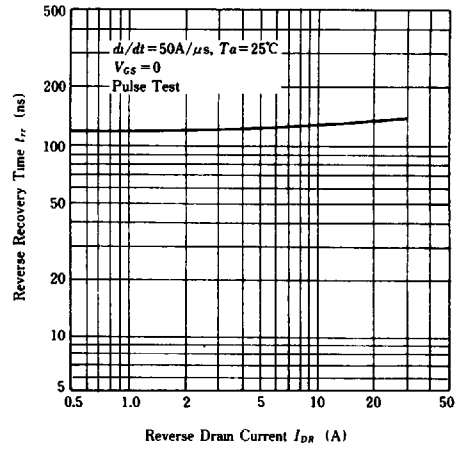
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT

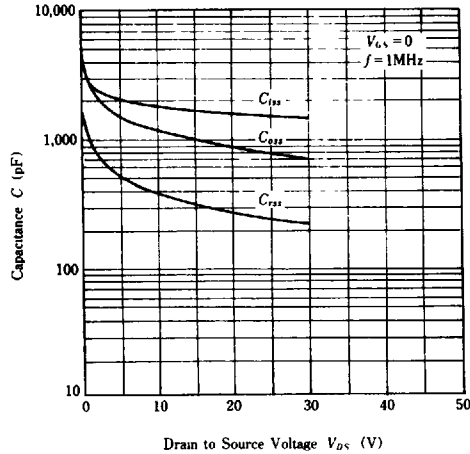


BODY-DRAIN DIODE REVERSE RECOVERY TIME

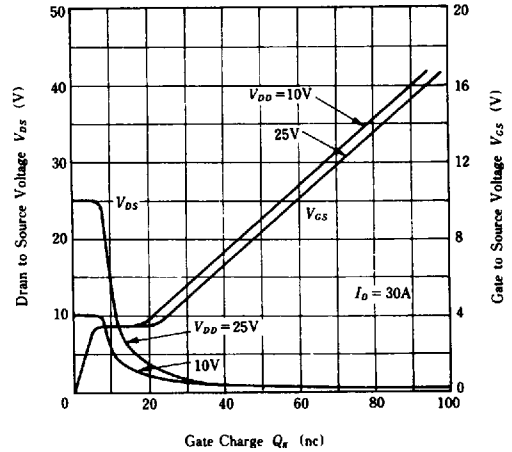


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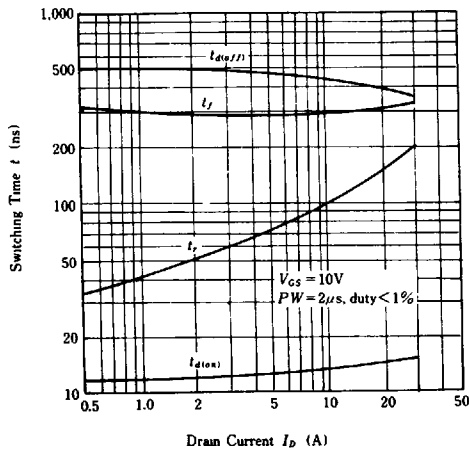
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



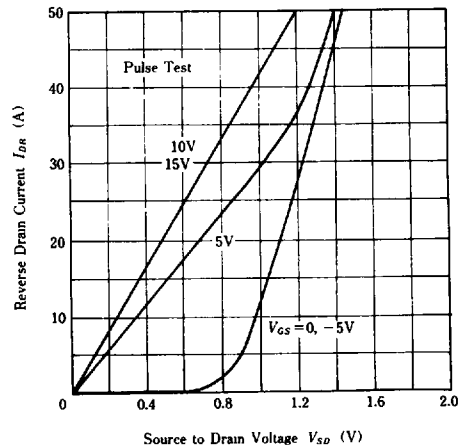
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS

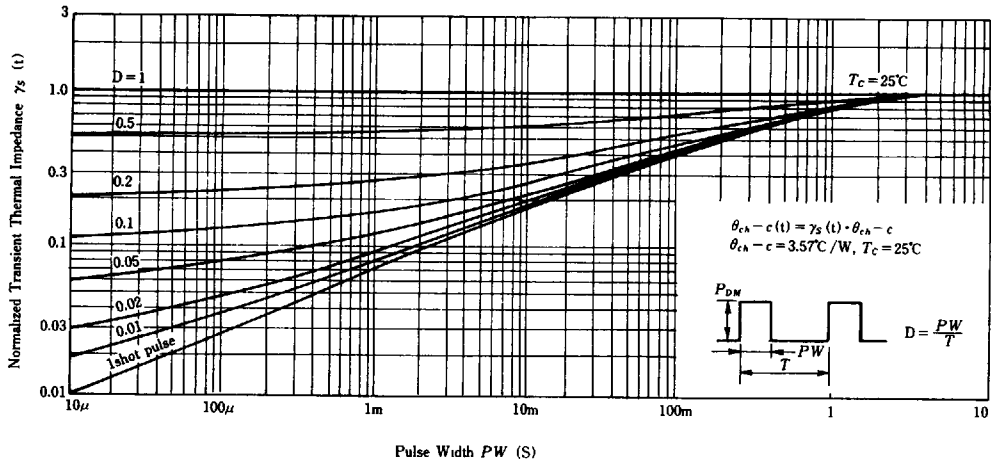


REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE

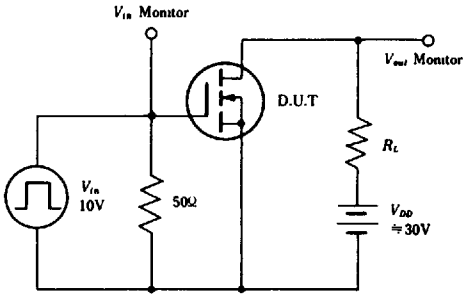


HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

