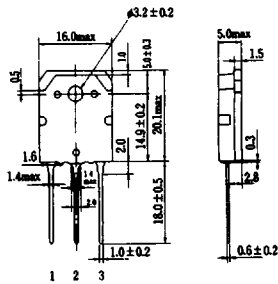
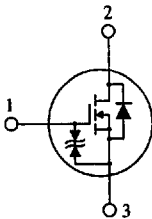


SILICON N-CHANNEL MOS FET

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 DC-DC Converter, Motor Drive, Power Switch, Solenoid Drive



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

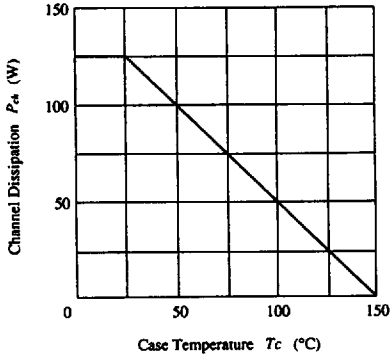
(TO-3P)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	40	A
Drain Peak Current	$I_{D (pulse)}$	160	A
Body-Drain Diode	I_{DR}	40	A
Reverse Drain Current			
Channel Dissipation	P_{ch}	125	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	$-55 \sim +150$	°C

*PW ≤ 10 μs, duty cycle ≤ 1%
**Value at Tc = 25°C

POWER VS. TEMPERATURE DERATING



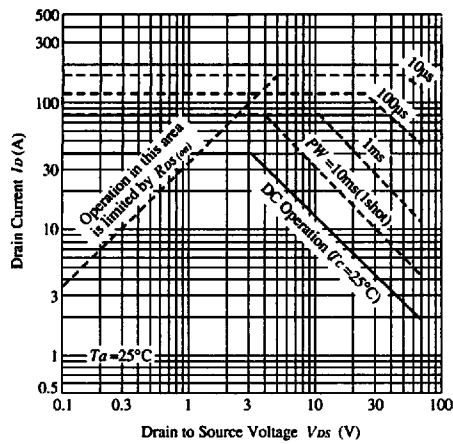
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0$	60	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = \pm 100 \mu A, V_{DS} = 0$	± 20	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 50V, V_{GS} = 0$	—	—	250	μA
Gate-Source Cutoff Voltage	$V_{GS (off)}$	$I_D = 1mA, V_{DS} = 10V$	1.0	—	2.5	V
Static Drain-Source on State Resistance	$R_{DS (on)}$	$I_D = 20A, V_{GS} = 10V^*$	—	0.024	0.03	Ω
		$I_D = 20A, V_{GS} = 4V^*$	—	0.035	0.055	
Forward Transfer Admittance	$ y_{fs} $	$I_D = 20A, V_{GS} = 10V^*$	17	28	—	S
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0, f = 1MHz$	—	2500	—	pF
Output Capacitance	C_{oss}		—	1250	—	pF
Reverse Transfer Capacitance	C_{rss}		—	200	—	pF
Turn-On Delay Time	$t_{d (on)}$	$I_D = 20A, V_{GS} = 10V, R_L = 1.5 \Omega$	—	20	—	ns
Rise Time	t_r		—	150	—	ns
Turn-Off Delay Time	$t_{d (off)}$		—	420	—	ns
Fall Time	t_f		—	200	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F = 40A, V_{GS} = 0^*$	—	1.3	—	V
Body-Drain Diode Reverse Recovery Time	t_r	$I_F = 40A, V_{GS} = 0, di_F/dt = 50A/\mu s$	—	170	—	ns

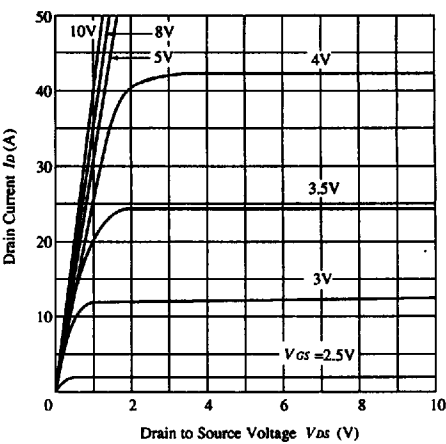
* Pulse Test

HITACHI/(OPTOELECTRONICS)

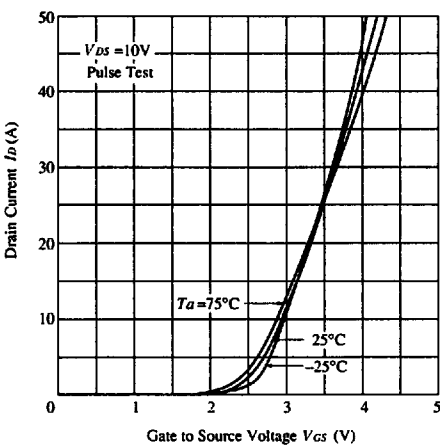
MAXIMUM SAFE OPERATION AREA



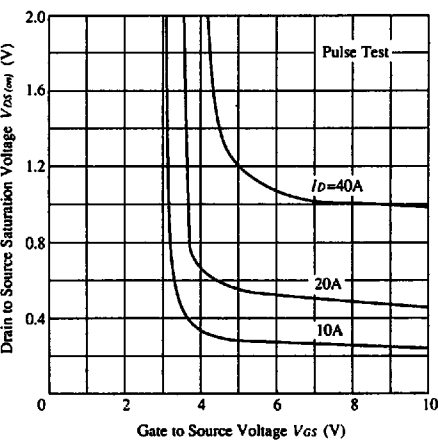
TYPICAL OUTPUT CHARACTERISTICS



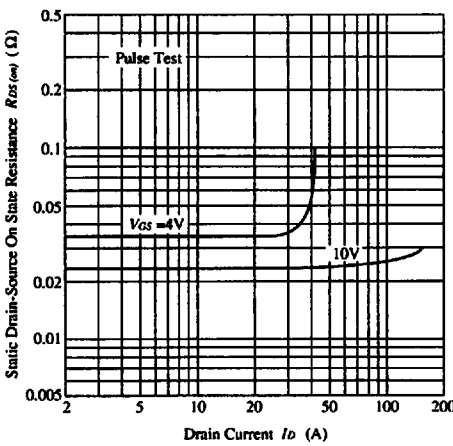
TYPICAL TRANSFER CHARACTERISTICS



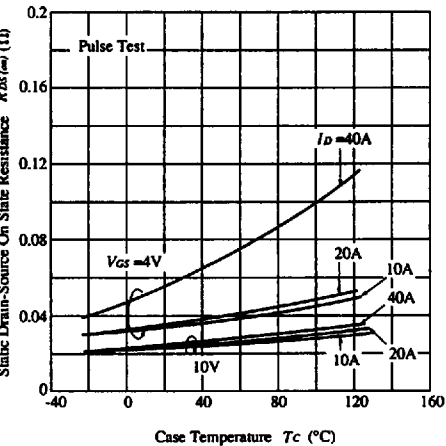
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT

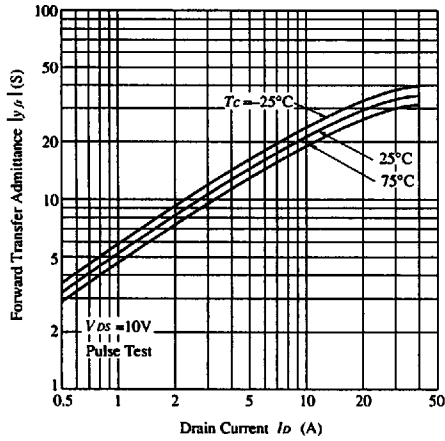


STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE

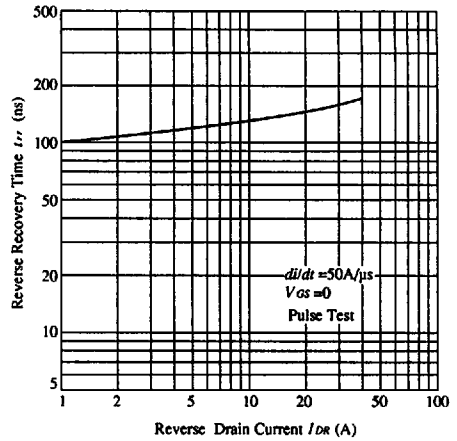


HITACHI/(OPTOELECTRONICS)

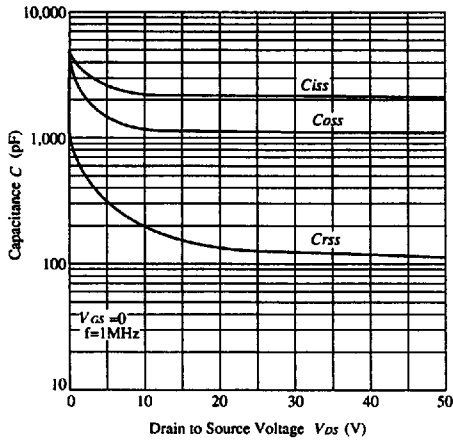
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT**



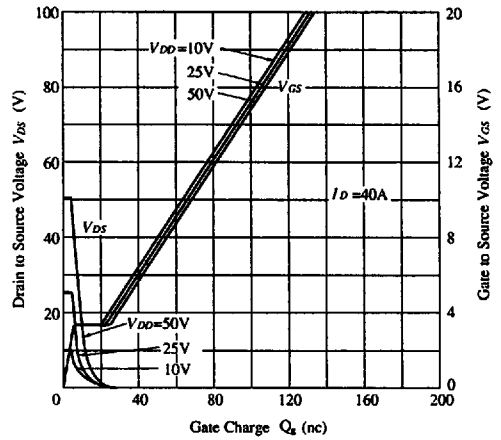
**BODY-DRAIN DIODE REVERSE
RECOVERY TIME**



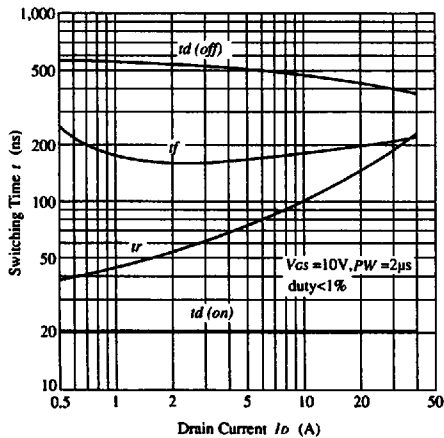
**TYPICAL CAPACITANCE
VS. DRAIN-SOURCE VOLTAGE**



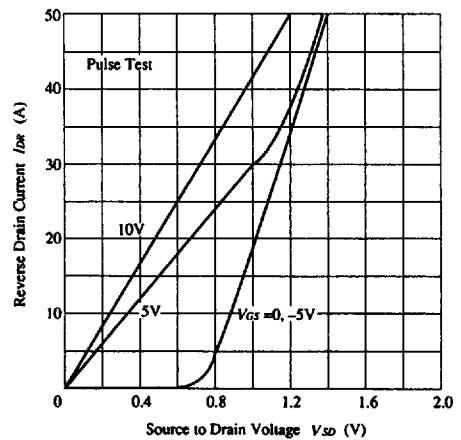
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS

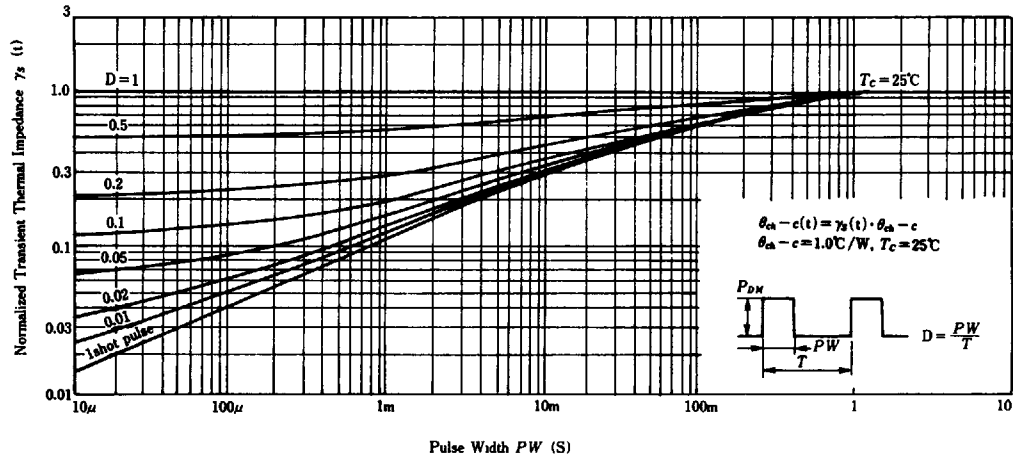


**REVERSE DRAIN CURRENT VS.
SOURCE TO DRAIN VOLTAGE**

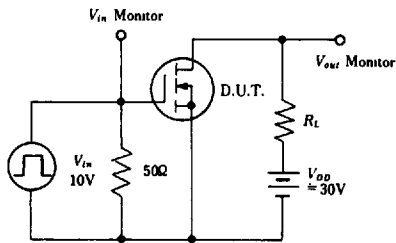


HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

