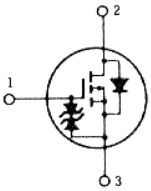
HITACHI

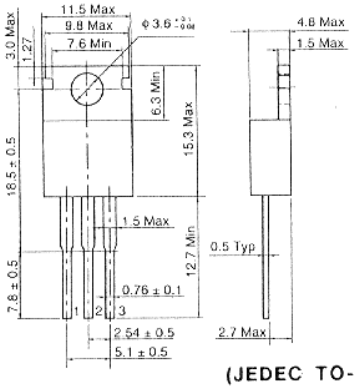
2SJ174

SILICON P-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 (Flange)
3. Source

(Dimensions in mm)

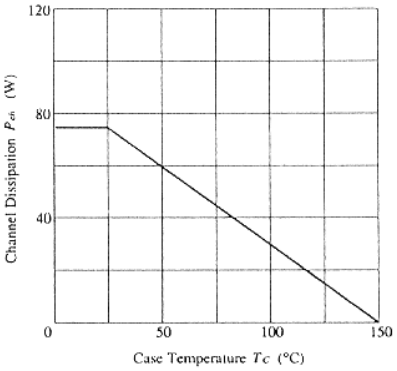
(JEDEC TO-220AB)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	−60	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	I_D	−20	A
Drain Peak Current	$I_{D(pulse)}$*	−80	A
Body-Drain Diode Reverse Drain Current	I_{DR}	−20	A
Channel Dissipation	P_{ch}**	75	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−55～+150	°C

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

POWER VS. TEMPERATURE DERATING

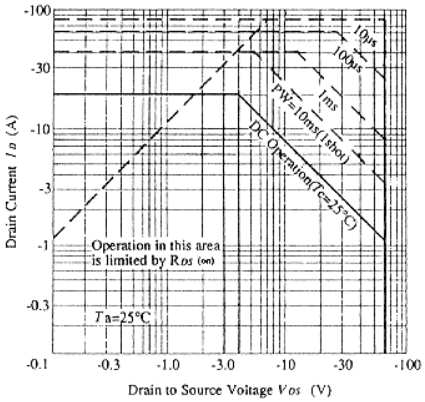


■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

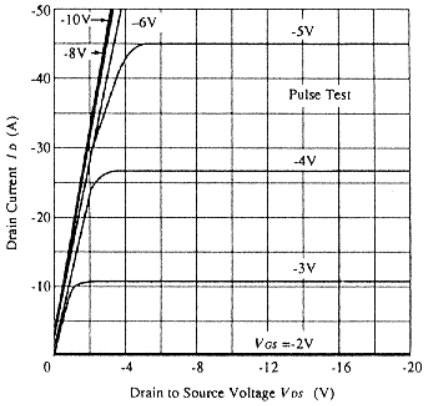
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−10mA, V_{GS}=0	−60	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G=±100μA, V_{DS}=0	±20	—	—	V
Gate-Source Leak Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0	—	—	±10	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=−50V, V_{GS}=0	—	—	−250	μA
Gate-Source Cutoff Voltage	$V_{GS(off)}$	I_D=−1mA, V_{DS}=−10V	−1.0	—	−2.0	V
Static Drain-Source on State Resistance	$R_{DS(on)}$	I_D=−10A, V_{GS}=−10V*	—	0.065	0.085	Ω
		I_D=−10A, V_{GS}=−4V*	—	0.09	0.13	
Forward Transfer Admittance	$\|y_{fs}\|$	I_D=−10A, V_{DS}=−10V*	8	13	—	S
Input Capacitance	C_{iss}	V_{DS}=−10V, V_{GS}=0 f=1MHz	—	1850	—	pF
Output Capacitance	C_{oss}		—	990	—	pF
Reverse Transfer Capacitance	C_{rss}		—	265	—	pF
Turn-on Delay Time	$t_{d(on)}$	I_D =−10A, V_{GS}=−10V R_L=3Ω	—	15	—	ns
Rise Time	t_r		—	125	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	345	—	ns
Fall Time	t_f		—	235	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	I_F=−20A, V_{GS}=0	—	−1.2	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	I_F=−20A, V_{GS}=0 di_F/dt=50A/μs	—	230	—	ns

*Pulse Test

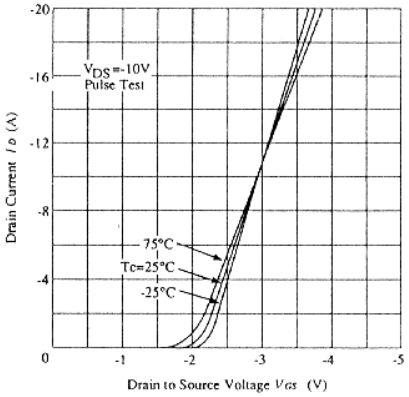
MAXIMUM SAFE OPERATION AREA



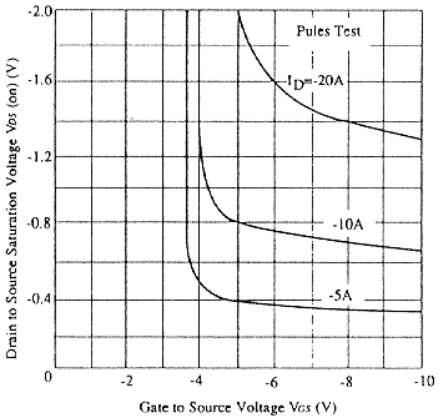
TYPICAL OUTPUT CHARACTERISTICS



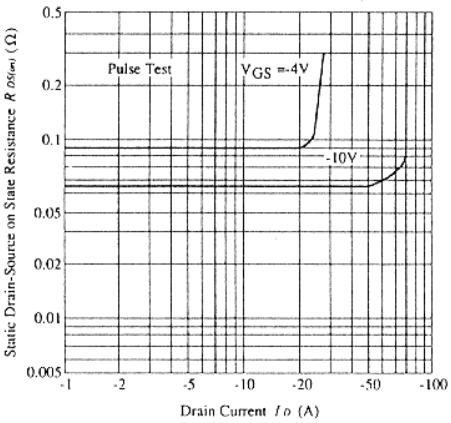
TYPICAL TRANSFER CHARACTERISTICS



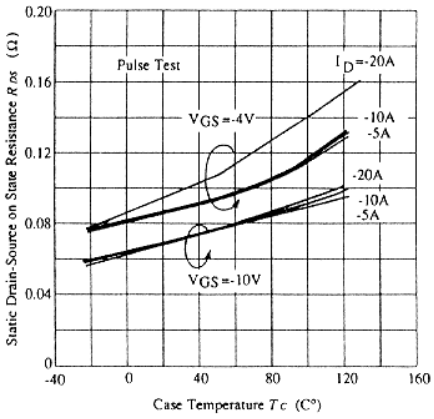
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



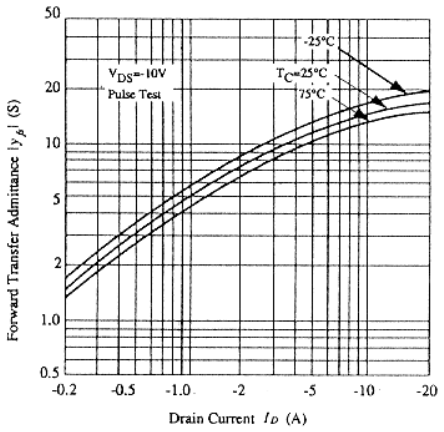
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



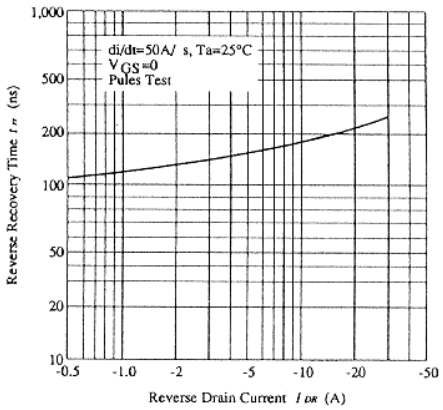
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



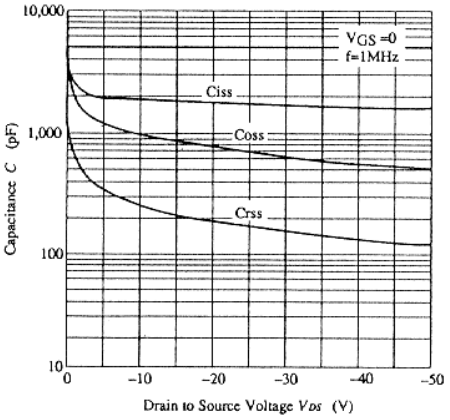
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



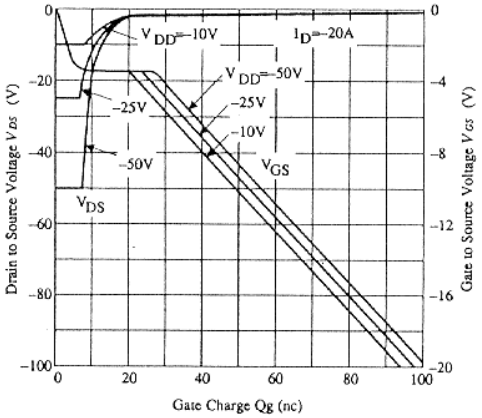
BODY-DRAIN DIODE REVERSE RECOVERY TIME



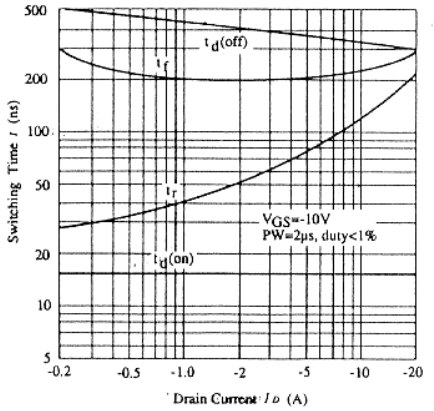
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



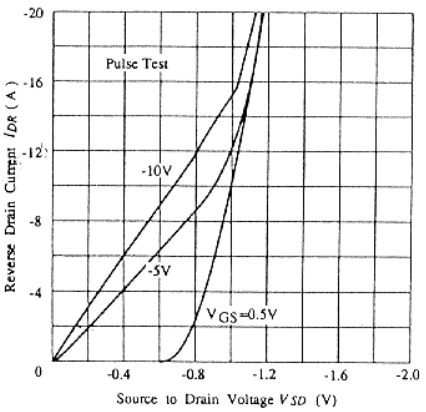
DYNAMIC INPUT CHARACTERISTICS



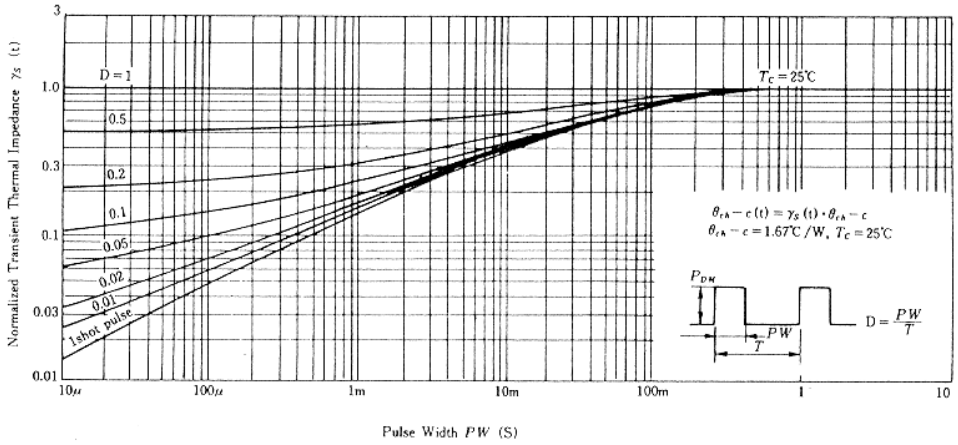
SWITCHING CHARACTERISTICS



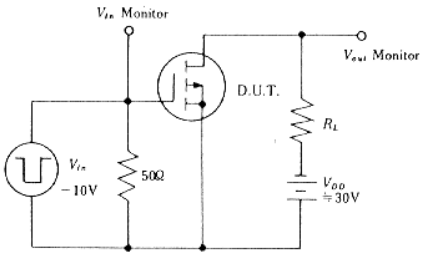
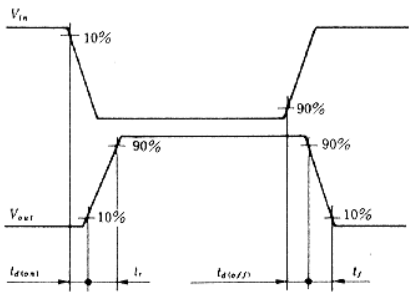
REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS