

2SJ169, 2SJ170

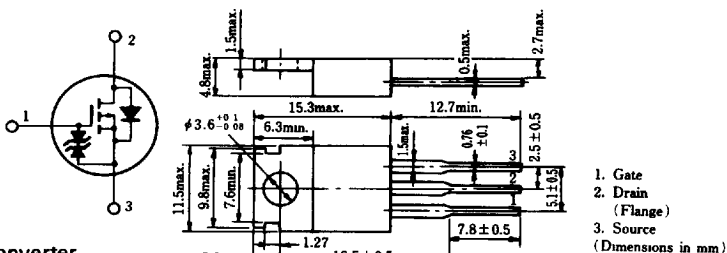
HITACHI/(OPTOELECTRONICS)

SILICON P-CHANNEL MOS FET

HIGH SPEED POWER SWITCHING

FEATURES

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



(JEDEC TO-220AB)

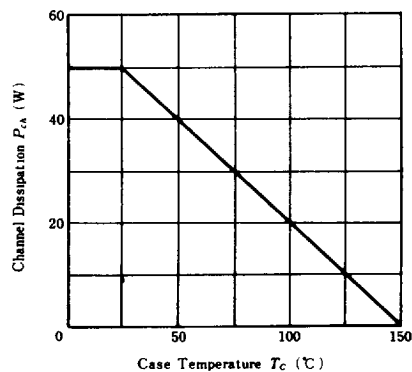
ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$)

Item	Symbol	2SJ169	2SJ170	Unit
Drain-Source Voltage	V_{DS}	-60	-80	V
Gate-Source Voltage	V_{GS}	± 20		V
Drain Current	I_D	-12		A
Drain Peak Current	$I_{D(\text{pulse})}^*$	-48		A
Body-Drain Diode Reverse Drain Current	I_{DR}	-12		A
Channel Dissipation	P_{ch}^{**}	50		W
Channel Temperature	T_{ch}	150		$^{\circ}\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$		$^{\circ}\text{C}$

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

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

POWER VS. TEMPERATURE DERATING

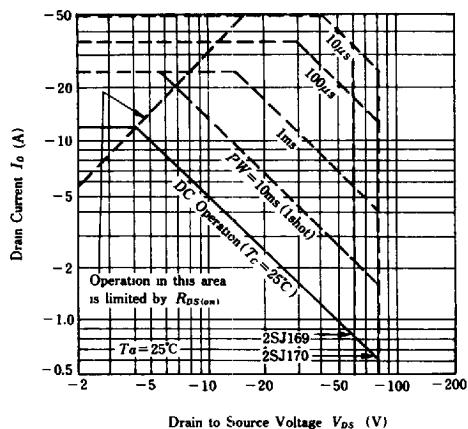


ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$)

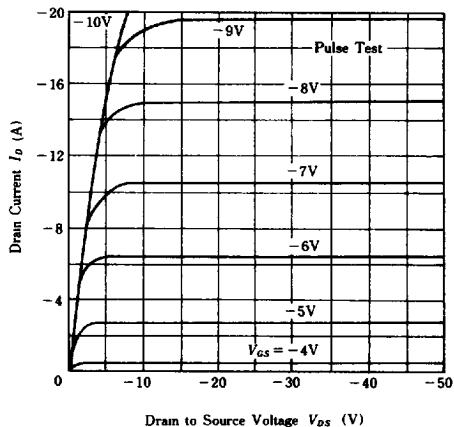
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR) DSS}$	$I_D = -250\mu\text{A}, V_{GS} = 0$	-60	—	—	V
			-80	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$	—	—	± 0.5	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60\text{V}, V_{GS} = 0$	—	—	—	μA
		$V_{DS} = -80\text{V}, V_{GS} = 0$	—	—	-250	μA
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D = -250\mu\text{A}, V_{DS} = V_{GS}$	-2.0	—	-4.0	V
Static Drain-Source on State Resistance	$R_{DS(on)}$	$I_D = -6.5\text{A}, V_{GS} = -10\text{V}^*$	—	0.3	0.35	Ω
Forward Transfer Admittance	$ y_{fs} $	$I_D = -6.5\text{A}, V_{DS} = -10\text{V}^*$	2.0	3.8	—	S
Input Capacitance	C_{iss}	$V_{DS} = -25\text{V}, V_{GS} = 0$ $f = 1\text{MHz}$	—	500	—	pF
Output Capacitance	C_{oss}		—	300	—	pF
Reverse Transfer Capacitance	C_{rss}		—	100	—	pF
Turn-on Delay Time	$t_{d(on)}$	$I_D = -6.5\text{A}, V_{GS} = -10\text{V}$ $R_s = 50\Omega, V_{DD} = -30\text{V}$	—	12	—	ns
Rise Time	t_r		—	110	—	ns
Turn-Off Delay Time	$t_{d(off)}$		—	40	—	ns
Fall Time	t_f		—	60	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F = -12\text{A}, V_{GS} = 0$	—	—	-6.3	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	$I_F = -12\text{A}, V_{GS} = 0$ $di_F/dt = 50\text{A}/\mu\text{s}$	—	200	—	ns

* Pulse Test

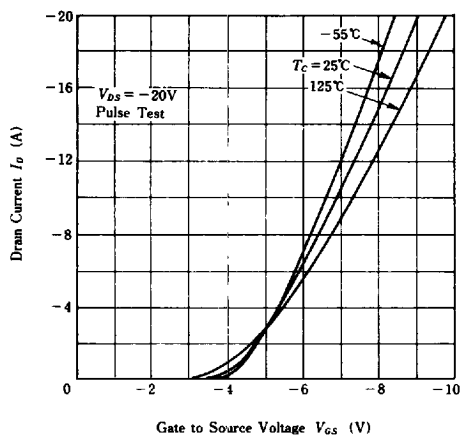
MAXIMUM SAFE OPERATION AREA



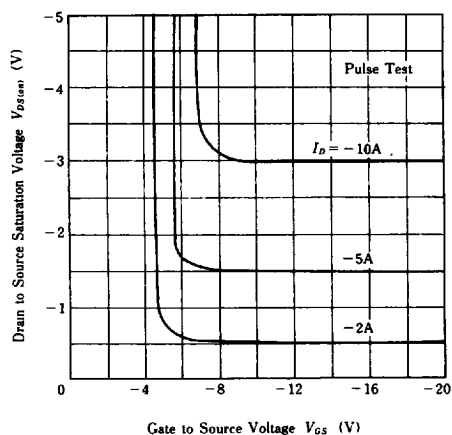
TYPICAL OUTPUT CHARACTERISTICS



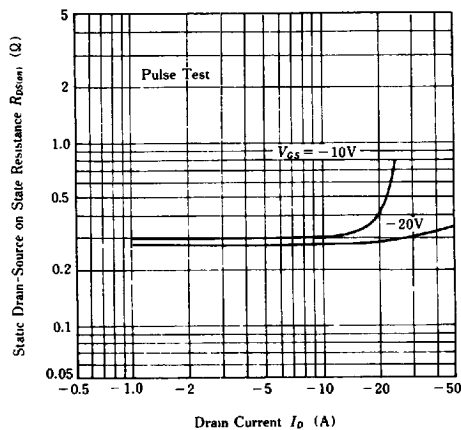
TYPICAL TRANSFER CHARACTERISTICS



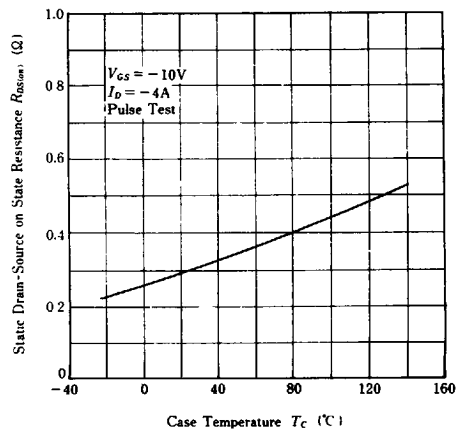
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



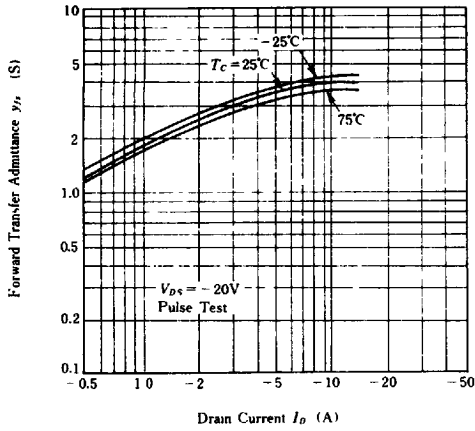
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



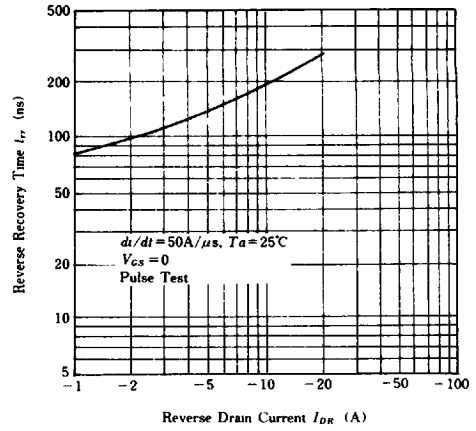
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



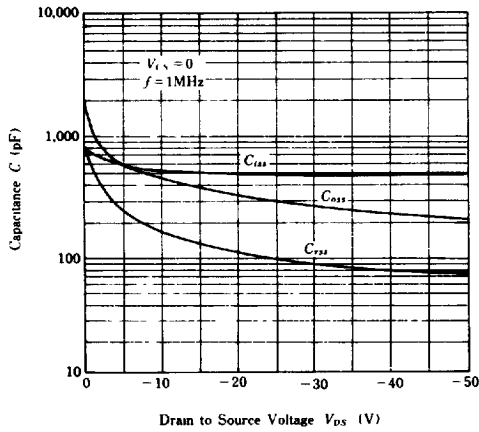
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT**



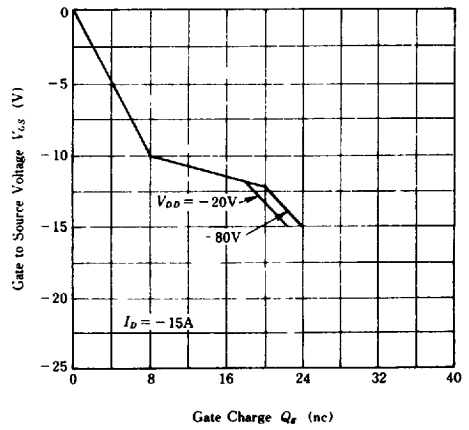
**BODY DRAIN DIODE REVERSE
RECOVERY TIME**



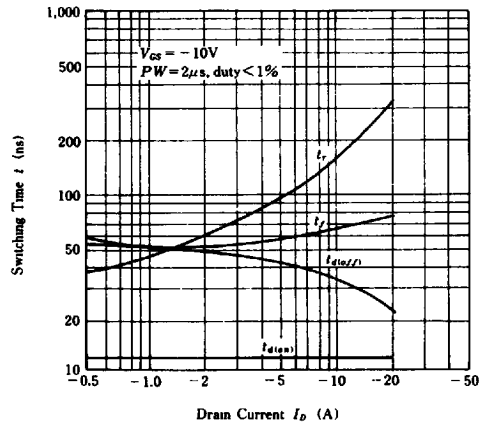
**TYPICAL CAPACITANCE
VS. DRAIN-SOURCE VOLTAGE**



DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS



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

