

# 2SJ169, 2SJ170

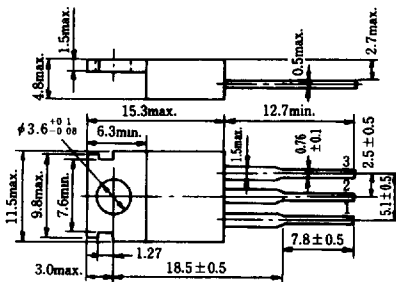
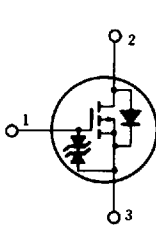
HITACHI/(OPTOELECTRONICS)

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



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

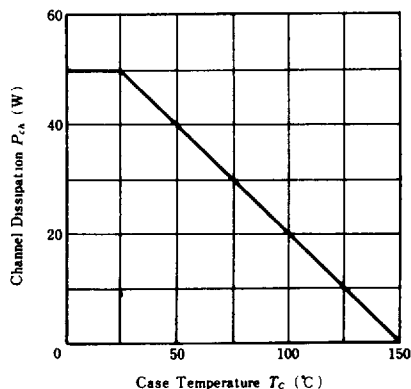
(JEDEC TO-220AB)

■ 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 ~ +150		$^\circ\text{C}$

\*PW ≤ 10μs, duty cycle ≤ 1%  
 \*\*Value at  $T_c = 25^\circ\text{C}$

POWER VS. TEMPERATURE DERATING

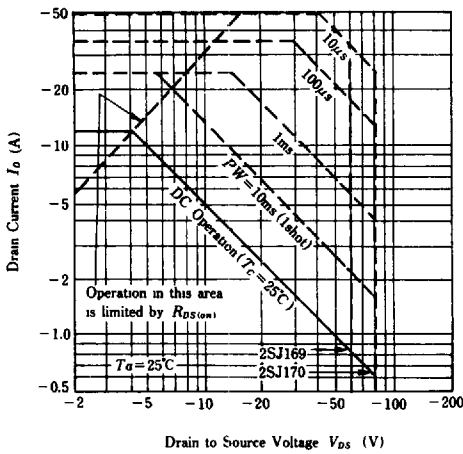


■ ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

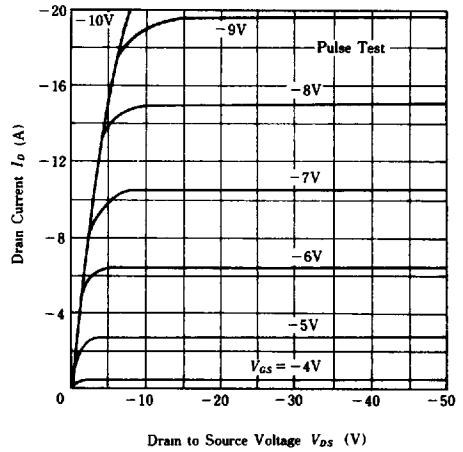
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	2SJ169	$I_D = -250\mu\text{A}, V_{GS} = 0$	-60	—	—	V
	2SJ170		-80	—	—	V
Gate-Source Leak Current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$	—	—	± 0.5	$\mu\text{A}$
Zero Gate Voltage Drain Current	2SJ169	$V_{DS} = -60\text{V}, V_{GS} = 0$	—	—	-250	$\mu\text{A}$
	2SJ170		—	—	-250	$\mu\text{A}$
Gate-Source Cutoff Voltage	$V_{GS(\text{off})}$	$I_D = -250\mu\text{A}, V_{DS} = V_{GS}$	-2.0	—	-4.0	V
Static Drain-Source on State Resistance	$R_{DS(\text{on})}$	$I_D = -6.5\text{A}, V_{GS} = -10\text{V}^*$	—	0.3	0.35	$\Omega$
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	$t_{d(\text{on})}$	$I_D = -6.5\text{A}, V_{GS} = -10\text{V}$ $R_s = 50\Omega, V_{DD} = -30\text{V}$	—	12	—	ns
Rise Time	$t_r$		—	110	—	ns
Turn-Off Delay Time	$t_{d(\text{off})}$		—	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

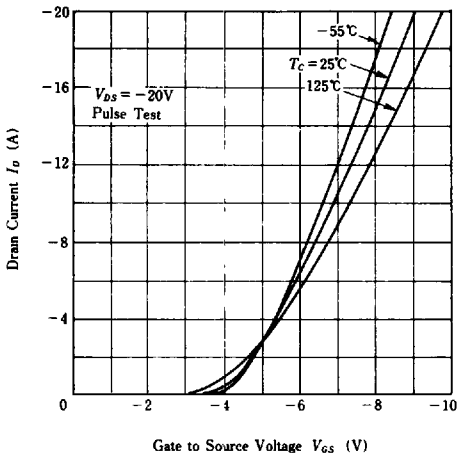
**MAXIMUM SAFE OPERATION AREA**



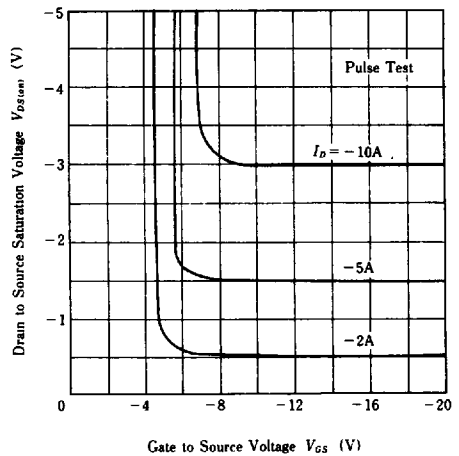
**TYPICAL OUTPUT CHARACTERISTICS**



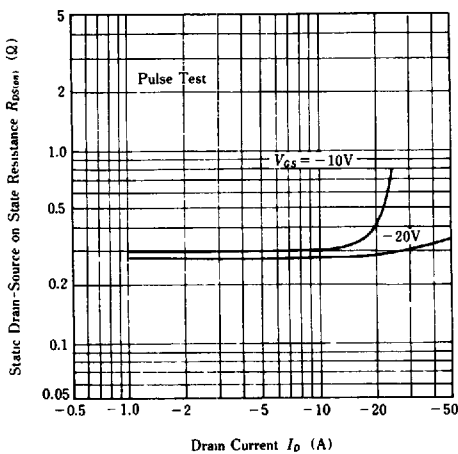
**TYPICAL TRANSFER CHARACTERISTICS**



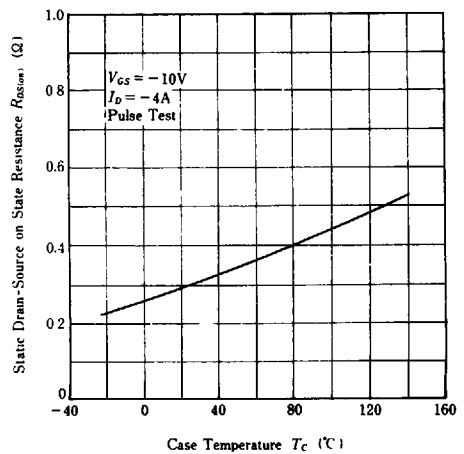
**DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE**



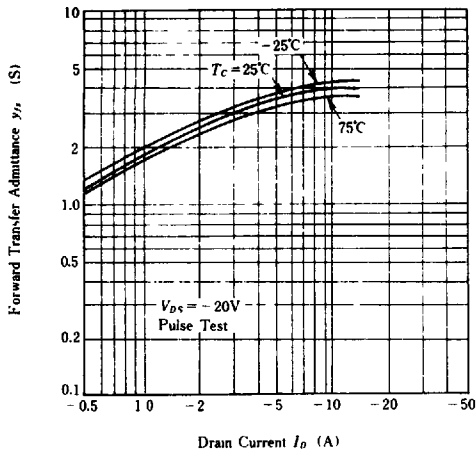
**STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT**



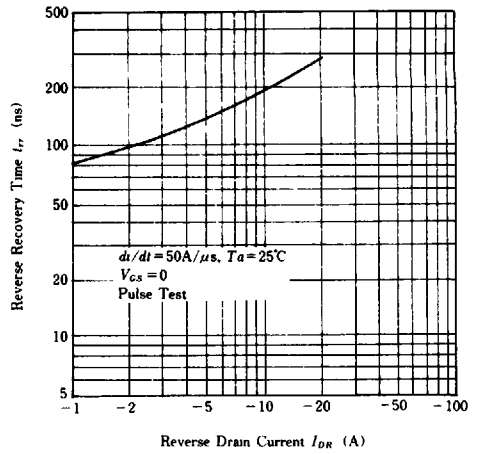
**STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE**



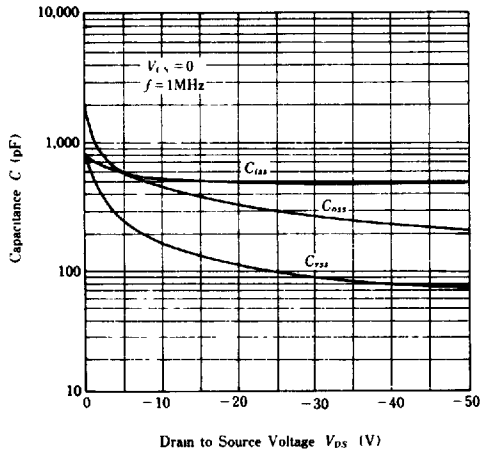
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT**



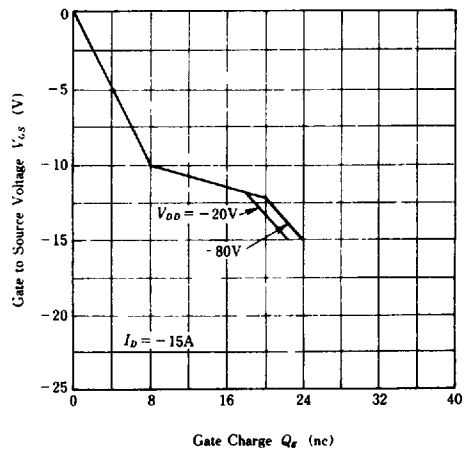
**BODY DRAIN DIODE REVERSE RECOVERY TIME**



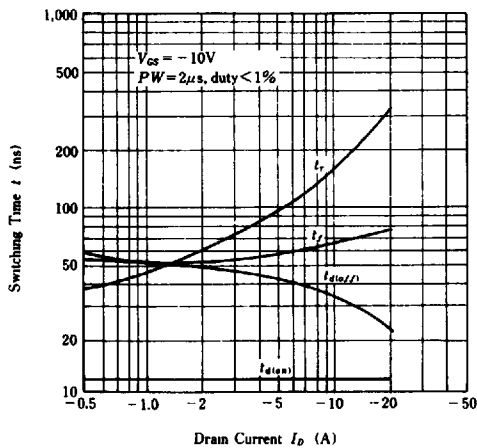
**TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE**



**DYNAMIC INPUT CHARACTERISTICS**



**SWITCHING CHARACTERISTICS**



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

