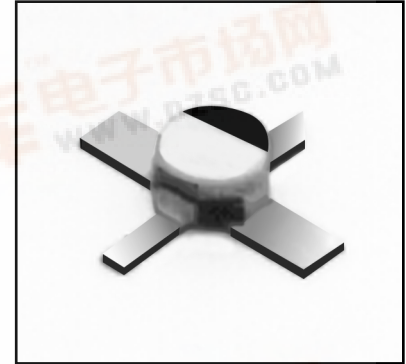


# FHX35X/002 FHX35LG/002

## Low Noise HEMT

### DESCRIPTION

The FHX35X/002 Chip and FHX35LG/002 packaged devices are HEMT (High Electron Mobility Transistor) ones suitable for use as the front end of an optical receiver in high speed lightwave communication systems. This HEMT combines high transconductance, low gate capacitance and low leakage current; all important factors in achieving low noise preamplification. Fujitsu's stringent Quality Assurance criteria and detailed Test Procedures assure Highest Reliability Performance.



LG PACKAGE

### FEATURES

- High Transconductance
- Low Leakage Current
- Low Gate Capacitance
- Gold Bonding System
- Proven Reliability

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

Item	Symbol	Conditions	Ratings	Unit
Drain-Source Voltage	$V_{DS}$		6	V
Gate-Source Voltage	$V_{GS}$		-5	V
Total Power Dissipation	$P_T$		290	mW
Storage Temperature	$T_{stg}$		-65 to 175	$^\circ\text{C}$
Channel Temperature	$T_{ch}$		+175	$^\circ\text{C}$
Thermal Resistance	$R_{th}$	Channel to Case	150	$^\circ\text{C/W}$

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

Item	Symbol	Conditions	Limits			Unit	
			Min.	Min.	Max.		
Drain Current	$I_{DSS}$	$V_{DS}=2\text{V}, V_{GS}=0\text{V}$	15	40	85	mA	
Transconductance	$g_m$	$V_{DS}=2\text{V}, I_{DS}=10\text{mA}$	45	60	-	mS	
Pinch-off Voltage	$V_p$	$V_{DS}=2\text{V}, I_{DS}=1\text{mA}$	-0.2	-1.0	-2.0	V	
Gate-Source Leakage Current	$I_{GSO}$	$V_{GS}=-2\text{V}$	-	10	20	nA	
Gate-Source Capacitance	$C_{GS}$	$V_{DS}=3\text{V}$ $I_{DS}=10\text{mA}$	FHX35X/002	-	0.27	-	pF
			FHX35LG/002	-	0.47	-	
Gate-Drain Capacitance	$C_{GD}$	$V_{DS}=3\text{V}, I_{DS}=10\text{mA}$	-	0.035	-	pF	

# FHX35X/002

# FHX35LG/002

Low Noise HEMT

Fig. 1 Drain Current vs. Drain-Source Voltage

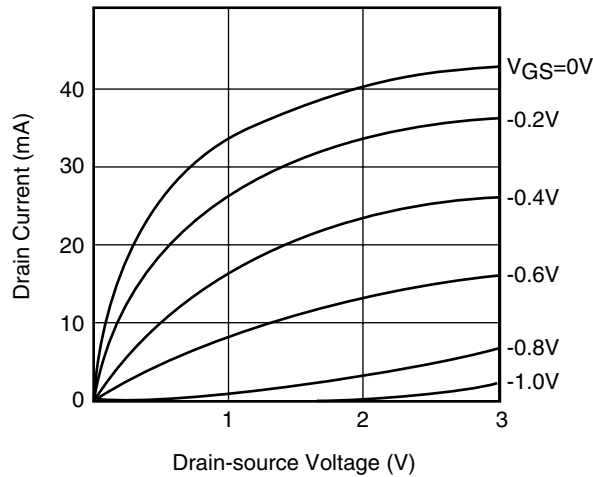


Fig. 2 Gate-Source Capacitance vs. Drain-Source Current

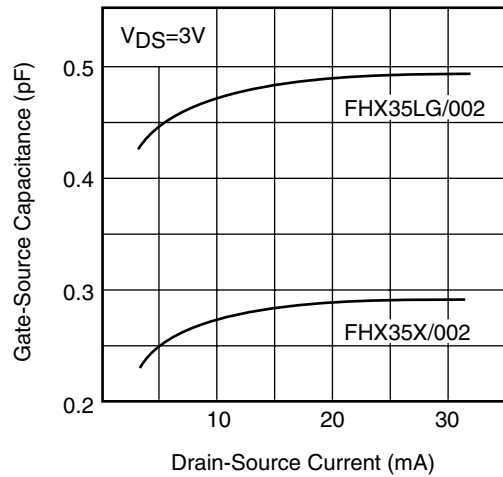


Fig. 3 Transconductance vs. Gate-Source Voltage

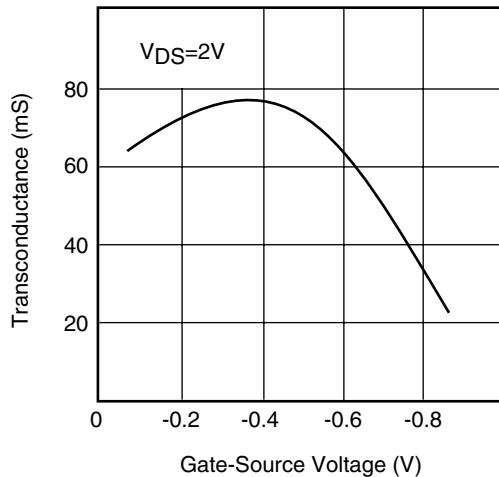
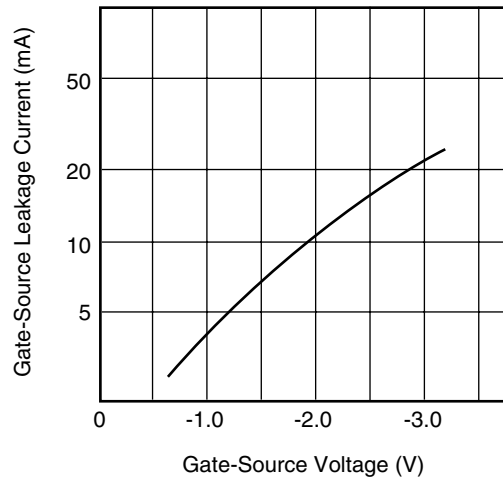


Fig. 4 Gate-Source Leakage Current vs. Gate-Source Voltage



---

---

---

**FHX35X/002**  
**FHX35LG/002**  
*Low Noise HEMT*

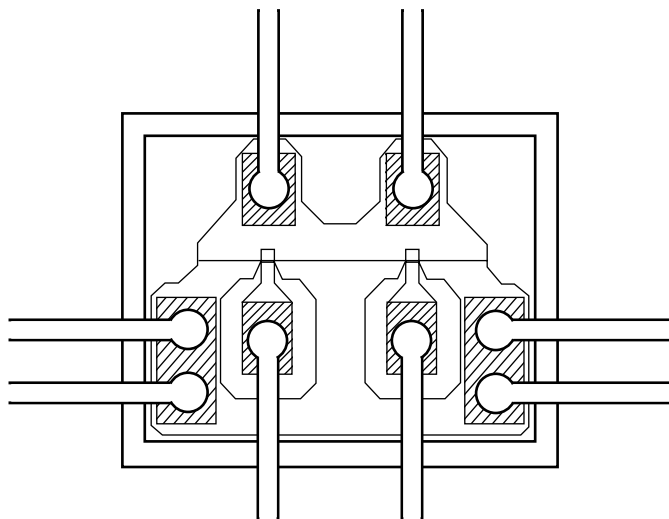
## **BONDING PROCEDURE FOR FET CHIPS**

Caution must be exercised to prevent static build up by proper grounding of all equipment and personnel. All operations must be performed in a clean, dust-free and dry environment.

1. Storage Condition: Store in a clean, dry nitrogen environment.
2. Die-Attach
  - 2.1 The die-attach station must have an accurate temperature control, and an inert forming gas should be used.
  - 2.2 Chips should be kept at room temperature, except during die-attach.
  - 2.3 Place package or carrier on the heated stage.
  - 2.4 Place the solder at the position where the chip will be bonded.
  - 2.5 Lightly grasp the chip edges using tweezers and scrub the die onto the Au-Sn solder preform. The die attach conditions are: 300 to 310° for 30 to 60 seconds. The Au-Sn (80-20) solder preform volume should be about  $3.2 \times 10^{-3} \text{ mm}^3$  for FHX35X/002.
3. Wire Bonding
  - 3.1 Bonding Condition  
The bonder must be properly grounded. Wire bonding should be performed with a thermal compression bonder using 0.7 to 1.0 mil diameter, half hard, 3-8% elongation gold wire.
  - 3.2 Wire Layout  
The wire bonding should be performed as shown in the following example.

## **Wire Layout**

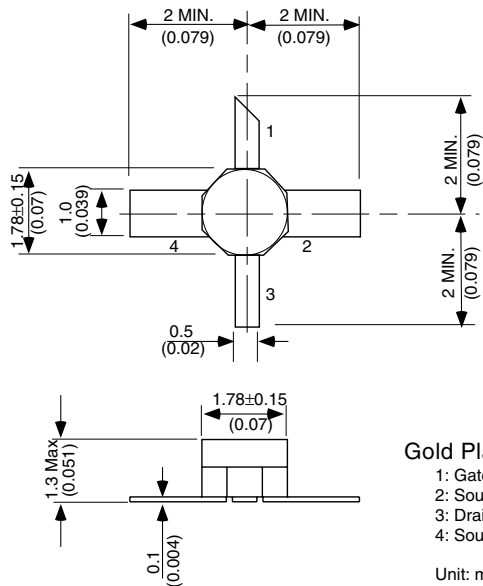
FHX35X/002



# FHX35X/002 FHX35LG/002

Low Noise HEMT

## Case Style "LG" Metal-Ceramic Package



For further information please contact:

**FUJITSU COMPOUND SEMICONDUCTOR, INC.**  
2355 Zanker Rd.  
San Jose, CA 95131-1138, U.S.A.  
Phone: (408) 232-9500  
FAX: (408) 428-9111  
www.fcsi.fujitsu.com

**FUJITSU MICROELECTRONICS EUROPE, GmbH**  
Quantum Devices Division  
Network House  
Norreys Drive  
Maidenhead, Berkshire SL6 4FJ  
Phone: +44 (0)1628 504800  
FAX: +44 (0)1628 504888

### CAUTION

Fujitsu Compound Semiconductor Products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- Do not put these products into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

Fujitsu Limited reserves the right to change products and specifications without notice. The information does not convey any license under rights of Fujitsu Limited or others.

© 1998 FUJITSU COMPOUND SEMICONDUCTOR, INC.  
Printed in U.S.A. FCSI0598M200