

# SEMITRONICS CORP.

64 Commercial Street, Freeport, N.Y. 11520  
Phone: (516) 623-9400 • Fax. (516) 623-6954

## SES837

### P-Channel MOSFET

#### FEATURES

- Non-Isolated Case
- Drain to Back of Case
- Hermetically Sealed Package
- Repetitive Avalanche Rating
- Dynamic  $dv/dt$  Rating
- MIL STX Screening Available

#### APPLICATIONS

- High Reliability Power Supplies
- Switch Mode Power Supplies
- Battery Back-Up Supplies
- High Speed Power Switching
- Inverters & Choppers

#### DESCRIPTION

The SES837 is a P-Mos Mosfet rated at -22 Amp, 200 volts,  $0.26\Omega$  packaged in a SMD hermetically sealed metallic package.  
For MIL-PRF-19500 TX Military screening add STX suffix to part number (SES837STX)

Special Pin-Outs Available  
Custom Lead Forming Available

#### PACKAGE



TO-257 SMD Version

#### CASE OUTLINE

See page 4 for complete outline

#### Absolute Maximum Ratings

Parameter	Maximum	Units
Continuous Drain Current $I_p$ @ $T_c = 25^\circ C$ , $V_{GS} @ -10V$	-22*	A
Continuous Drain Current $I_p$ @ $T_c = 100^\circ C$ , $V_{GS} @ -10V$	-14*	A
Pulse Drain Current $I_{DM}$	-44 <sup>1</sup>	A
Power Dissipation $P_D$ @ $T_c = 25^\circ C$	125	W
Linear Derating Factor	1.0	W/ $^\circ C$
Gate-to-Source Voltage $V_{GS}$	$\pm 20$	V
Peak Diode Recovery $dv/dt$	-5.0 <sup>3</sup>	V/ns
Operating & Storage Temperature $T_j$ & $T_{STG}$	-55 to +150	$^\circ C$

\* Additional Doubling of Terminal Leads required

### Static @ T<sub>j</sub> = 25°C (unless otherwise specified)

Parameter	Min.	Typ.	Max.	Units	Conditions
Drain-to-Source Breakdown Voltage V <sub>(BR)DSS</sub>	-200	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1.0mA
Temperature Coefficient of Breakdown Voltage ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	—	-0.2	—	V/°C	Reference to 25°C, I <sub>D</sub> = -1.0mA
Static Drain to Source On-Resistance R <sub>DS(on)</sub>	—	—	0.27	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -22A note <sup>4</sup>
Gate Threshold Voltage V <sub>GS(TH)</sub>	-2.0	—	-4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250uA
Zero Gate Voltage Drain Current I <sub>DSS</sub>	—	—	-25	uA	V <sub>DS</sub> = 0.8 x Max rating, V <sub>GS</sub> = 0V
	—	—	-250		V <sub>DS</sub> = 0.8 x Max Rating, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
Gate-to-Source Forward Leakage I <sub>GSS</sub>	—	—	-100	nA	V <sub>GS</sub> = -20V
Gate-to-Source Reverse Leakage I <sub>GSS</sub>	—	—	100		V <sub>GS</sub> = 20V

### Dynamic @ T<sub>j</sub> = 25°C (unless otherwise specified)

Parameter	Min.	Typ.	Max.	Units	Conditions
Forward Transconductance g <sub>fs</sub>	4.0	—	—	S	V <sub>DS</sub> = >-15V, I <sub>DS</sub> = -14A note <sup>4</sup>
Total Gate Charge Q <sub>g</sub>	—	—	60	nC	I <sub>D</sub> = -14A V <sub>DS</sub> = 0.5 x Max Rating V <sub>GS</sub> = -10V
Gate-to-Source Charge Q <sub>gs</sub>	—	—	15		
Gate-to-Drain ("Miller") charge Q <sub>gd</sub>	—	—	38		
Turn-on-Delay Time t <sub>d(on)</sub>	—	—	35	ns	V <sub>DD</sub> = -200V I <sub>D</sub> = -14A R <sub>G</sub> = 9.1 Ohms V <sub>GS</sub> = -10V
Rise Time t <sub>r</sub>	—	—	85		
Turn-Off-Delay Time t <sub>d(off)</sub>	—	—	85		
Fall time t <sub>f</sub>	—	—	65		
Input Capacitance C <sub>iss</sub>	—	2400	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = -25V f = 1.0 MHz
Output Capacitance C <sub>oss</sub>	—	570	—		
Reverse Transfer Capacitance C <sub>rss</sub>	—	81	—		
Internal Drain Inductance L <sub>D</sub>	—	6.8	—	nH	Measured from the center of the drain pad to the center of the source pad.
Internal Source Inductance L <sub>S</sub>	—	6.8	—		

## Semitronics Corp.

64 Commercial Street, Freeport, NY 11520 • Phone (516) 623-9400 • Fax (516) 623-6954

**Avalanche Characteristics**

Parameter		Typ.	Max.	Units
Single Pulse Avalanche Energy	$E_{AS}$	—	500 <sup>2</sup>	mJ
Avalanche Current	$I_{AR}$	—	-11 <sup>1</sup>	A
Repetitive Avalanche Energy	$E_{AR}$	—	12.5 <sup>1</sup>	mJ

**Thermal Resistance**

Parameter		Typ.	Max.	Units
Junction-to-case	$R_{\theta JC}$	—	1.0	°C/W
Case-to-Sink	$R_{\theta CS}$	0.21	—	
Junction-to-Ambient	$R_{\theta JA}$	—	48	

**Diode Characteristics**

Parameter		Min.	Typ.	Max.	Units	Conditions
Continuous Source Current	$I_S$	—	—	-22	A	
Pulsed Source Current	$I_{SM}$	—	—	-88 <sup>1</sup>		
Diode Forward Voltage	$V_{SD}$	—	—	-4.6	V	$T_j = 25^\circ\text{C}$ , $I_S = -22\text{A}$ , $V_{GS} = 0\text{V}$ <sup>4</sup>
Reverse Recovery Time	$t_{rr}$	—	—	440	ns	$T_j = 25^\circ\text{C}$ , $I_F = -22\text{A}$ $di/dt \leq 100\text{A}/\mu\text{s}$ $V_{DD} = -50\text{V}$ note <sup>4</sup>
Reverse Recovery Charge	$Q_{rr}$	—	—	7.2	uC	
Forward Turn-on Time	$t_{on}$	Intrinsic turn-on time is negligible				

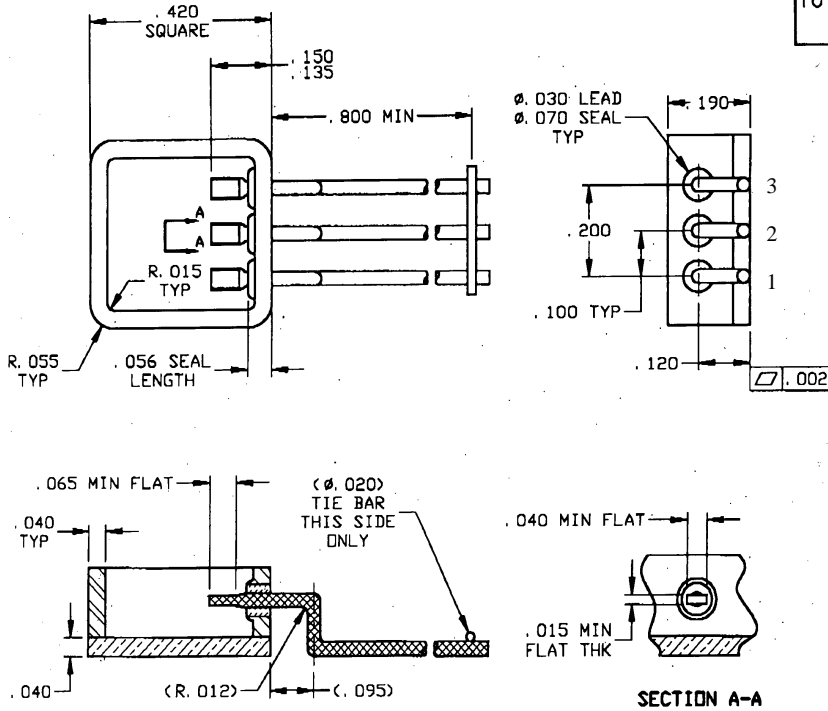
1. Repetitive Rating; Pulse width limited by maximum junction temperature. Doubling Terminal Leads required.
2.  $V_{DD} = -25\text{V}$ , starting  $T_j = 25^\circ\text{C}$ ,  $L = 8.3\text{mH}$  Peak  $I_L = -22\text{A}$ ,  $V_{GS} = -10\text{V}$
3.  $I_S \leq -22\text{A}$ ,  $di/dt \leq -150\text{A}/\mu\text{s}$ ,  $V_{DD} \leq -200\text{V}$ ,  $T_j \leq 150^\circ\text{C}$
4. Pulse width  $\leq 300\mu\text{s}$ ; Duty Cycle  $\leq 2\%$

**Semitronics Corp.**

64 Commercial Street, Freeport, NY 11520 • Phone (516) 623-9400 • Fax (516) 623-6954

TO-257 Surface Mount Leadformed Package Outline

DRAWING NO.  
 S-1402



- Terminals: Pin 1 = Source, Pin 2 = Gate, Pin 3 = Source
- Non-Isolated Case. Drain connected to back of case
- Base Material: OFHC, Oxygen Free High Conductivity Copper
- Terminal Leads are Copper Core 52 Alloy
- Isolation Seals are Glass

**Semitronics Corp.**

64 Commercial Street, Freeport, NY 11520 • Phone (516) 623-9400 • Fax (516) 623-6954