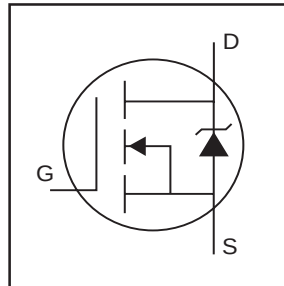


# FC48SA50FL

SMPS HEXFET® Power MOSFET

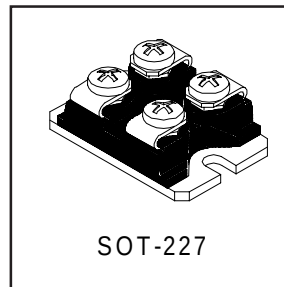
- Fully Isolated Package
- Easy to Use and Parallel
- Low On-Resistance
- Dynamic dv/dt Rating
- Fully Avalanche Rated
- Simple Drive Requirements
- Low Drain to Case Capacitance
- Low Internal Inductance



$$V_{DS} = 500V$$

$$R_{DS(on)} = 0.075\Omega$$

$$I_D = 48A$$



SOT-227

## Absolute Maximum Ratings

|                           | Parameter                                | Max.         | Units |
|---------------------------|------------------------------------------|--------------|-------|
| $I_D @ T_C = 25^\circ C$  | Continuous Drain Current, $V_{GS} @ 10V$ | 48           | A     |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 32           |       |
| $I_{DM}$                  | Pulsed Drain Current ①                   | 240          |       |
| $P_D @ T_C = 25^\circ C$  | Power Dissipation                        | 500          | W     |
|                           | Linear Derating Factor                   |              | W/°C  |
| $V_{GS}$                  | Gate-to-Source Voltage                   | $\pm 30$     | V     |
| $E_{AS}$                  | Single Pulse Avalanche Energy②           |              | mJ    |
| $I_{AR}$                  | Avalanche Current                        |              | A     |
| $E_{AR}$                  | Repetitive Avalanche Energy              |              | mJ    |
| dv/dt                     | Peak Diode Recovery dv/dt ③              | 19           | V/ns  |
| $T_J$                     | Operating Junction and                   | -55 to + 150 | °C    |
| $T_{STG}$                 | Storage Temperature Range                |              |       |
| $V_{ISO}$                 | Insulation Withstand Voltage (AC-RMS)    | 2.5          | kV    |
|                           | Mounting torque, M4 screw                | 1.3          | N•M   |

## Thermal Resistance

|                 | Parameter                           | Typ. | Max. | Units |
|-----------------|-------------------------------------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case                    | —    | 0.25 | °C/W  |
| $R_{\theta CS}$ | Case-to-Sink, Flat, Greased Surface | 0.05 | —    |       |

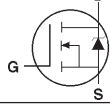
# FC48SA50FL



## Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

|                                 | Parameter                            | Min. | Typ.  | Max. | Units   | Conditions                                            |
|---------------------------------|--------------------------------------|------|-------|------|---------|-------------------------------------------------------|
| $V_{(BR)DSS}$                   | Drain-to-Source Breakdown Voltage    | 500  | —     | —    | V       | $V_{GS} = 0V, I_D = 500\mu A$                         |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 0.28  | —    | V/°C    | Reference to $25^\circ\text{C}$ , $I_D = 1mA$         |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 0.075 | 0.09 | W       | $V_{GS} = 10V, I_D = 48A$ „                           |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 3.0  | —     | 5.0  | V       | $V_{DS} = V_{GS}, I_D = 500\mu A$                     |
| $g_{fs}$                        | Forward Transconductance             | —    | 30    | —    | S       | $V_{DS} = 50V, I_D = 38A$                             |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —     | 100  | $\mu A$ | $V_{DS} = 500V, V_{GS} = 0V$                          |
|                                 |                                      | —    | —     | 4000 |         | $V_{DS} = 400V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —    | —     | 200  | nA      | $V_{GS} = 30V$                                        |
|                                 | Gate-to-Source Reverse Leakage       | —    | —     | -200 |         | $V_{GS} = -30V$                                       |
| $Q_g$                           | Total Gate Charge                    | —    | —     | 420  | nC      | $I_D = 48A$                                           |
| $Q_{gs}$                        | Gate-to-Source Charge                | —    | —     | 120  |         | $V_{DS} = 400V$                                       |
| $Q_{gd}$                        | Gate-to-Drain ("Miller") Charge      | —    | —     | 200  |         | $V_{GS} = 10V$                                        |
| $t_{d(on)}$                     | Turn-On Delay Time                   | —    | —     | —    | ns      |                                                       |
| $t_r$                           | Rise Time                            | —    | —     | —    |         |                                                       |
| $t_{d(off)}$                    | Turn-Off Delay Time                  | —    | —     | —    |         |                                                       |
| $t_f$                           | Fall Time                            | —    | —     | —    |         |                                                       |
| $L_S$                           | Internal Source Inductance           | —    | 5.0   | —    | nH      | Between lead, and center of die contact               |
| $C_{iss}$                       | Input Capacitance                    | —    | —     | —    | pF      |                                                       |
| $C_{oss}$                       | Output Capacitance                   | —    | —     | —    |         |                                                       |
| $C_{rss}$                       | Reverse Transfer Capacitance         | —    | —     | —    |         |                                                       |

## Source-Drain Ratings and Characteristics

|          | Parameter                              | Min.                                                                        | Typ. | Max. | Units   | Conditions                                                                                                                                           |
|----------|----------------------------------------|-----------------------------------------------------------------------------|------|------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current (Body Diode) | —                                                                           | —    | 48   | A       | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ①   | —                                                                           | —    | —    |         |                                                                                                                                                      |
| $V_{SD}$ | Diode Forward Voltage                  | —                                                                           | —    | 1.4  | V       | $T_J = 25^\circ\text{C}, I_S = 48A, V_{GS} = 0V$ „                                                                                                   |
| $t_{rr}$ | Reverse Recovery Time                  | —                                                                           | 170  | —    | ns      | $T_J = 25^\circ\text{C}, I_F = 48A$                                                                                                                  |
| $Q_{rr}$ | Reverse Recovery Charge                | —                                                                           | 1.1  | —    | $\mu C$ | $di/dt = 100A/\mu s$ „                                                                                                                               |
| $t_{on}$ | Forward Turn-On Time                   | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$ ) |      |      |         |                                                                                                                                                      |

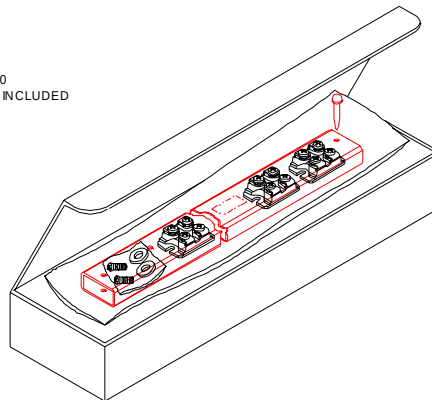
### Notes:

① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )

④ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .

[illegible]

QUANTITY PER TUBE IS 10  
M4 SREW AND WASHER INCLUDED



International  
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