

RoHS Compliant Product
A suffix of "-C" specifies halogen free

DESCRIPTION

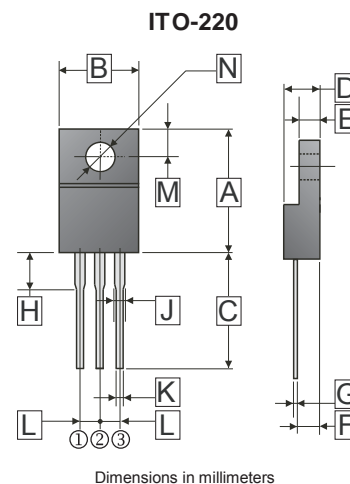
These miniature surface mount MOSFETs utilize a high cell density trench process to provide Low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

FEATURES

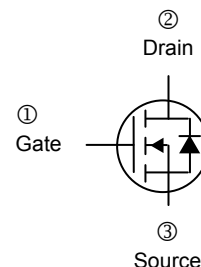
- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe ITO-220 saves board space.
- Fast switching speed.
- High performance trench technology.

PRODUCT SUMMARY

| SSRF30N20-400 | | |
|---------------|------------------------|-----------------|
| $V_{DS}(V)$ | $R_{DS(on)} (m\Omega)$ | $I_D(A)$ |
| 200 | 400@ $V_{GS}= 10V$ | 23 ¹ |
| | 450@ $V_{GS}= 4.5V$ | |



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|-------|------|------------|------------|
| | Min. | Max. | | Min. | Max. |
| A | 15.00 | 15.60 | H | 3.00 | 3.80 |
| B | 9.50 | 10.50 | J | 0.90 | 1.50 |
| C | 13.00 Min | | K | 0.50 | 0.90 |
| D | 4.30 | 4.70 | L | 2.34 | 2.74 |
| E | 2.50 | 3.10 | M | 2.50 | 2.90 |
| F | 2.40 | 2.80 | N | $\phi 3.1$ | $\phi 3.4$ |
| G | 0.30 | 0.70 | | | |



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|------------------------|-----------|----------------|
| Drain-Source Voltage | V_{DS} | 200 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ¹ | $I_D @ T_C=25^\circ C$ | 23 | A |
| Pulsed Drain Current ² | I_{DM} | 240 | A |
| Continuous Source Current (Diode Conduction) ¹ | I_S | 90 | A |
| Total Power Dissipation ¹ | $P_D @ T_C=25^\circ C$ | 300 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 ~ 175 | $^\circ C$ |
| THERMAL RESISTANCE RATINGS | | | |
| Maximum Thermal Resistance Junction-Ambient ¹ | $R_{\theta JA}$ | 62.5 | $^\circ C / W$ |
| Maximum Thermal Resistance Junction-Case | $R_{\theta JC}$ | 0.5 | $^\circ C / W$ |

Notes :

- 1 Package Limited.
- 2 Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$ unless otherwise specified)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|--------------|------|------|-----------|------------|--|
| Static | | | | | | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | 1 | - | - | V | $V_{DS} = V_{GS}, I_D = 250 \mu A$ |
| Gate-Body Leakage | I_{GSS} | - | - | ± 100 | nA | $V_{DS} = 0V, V_{GS} = 20V$ |
| Zero Gate Voltage Drain Current | I_{DSS} | - | - | 1 | μA | $V_{DS} = 160V, V_{GS} = 0V$ |
| | | - | - | 25 | | $V_{DS} = 160V, V_{GS} = 0V, T_J = 55^\circ C$ |
| On-State Drain Current ¹ | $I_{D(on)}$ | 120 | - | - | A | $V_{DS} = 5V, V_{GS} = 10V$ |
| Drain-Source On-Resistance ¹ | $R_{DS(ON)}$ | - | - | 400 | m Ω | $V_{GS} = 10V, I_D = 30 A$ |
| | | - | - | 450 | | $V_{GS} = 4.5V, I_D = 20 A$ |
| Forward Transconductance ¹ | g_{fs} | - | 30 | - | S | $V_{DS} = 15V, I_D = 30 A$ |
| Diode Forward Voltage | V_{SD} | - | 1.1 | - | V | $I_S = 34 A, V_{GS} = 0 V$ |
| Dynamic ² | | | | | | |
| Total Gate Charge | Q_g | - | 8.5 | - | nC | $V_{DS} = 15 V$ $V_{GS} = 4.5 V$ $I_D = 90 A$ |
| Gate-Source Charge | Q_{gs} | - | 3.3 | - | | |
| Gate-Drain Charge | Q_{gd} | - | 4.0 | - | | |
| Turn-on Delay Time | $T_{d(on)}$ | - | 18 | - | nS | $V_{DD} = 25 V$ $I_D = 34 A$ $V_{GEN} = 10 V$ $R_L = 25 \Omega$ |
| Rise Time | T_r | - | 59 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 37 | - | | |
| Fall Time | T_f | - | 9 | - | | |

Notes

- 1 Pulse test : Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
2 Guaranteed by design, not subject to production testing.