

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| -100V         | 145mΩ@-10V      | -12A  |

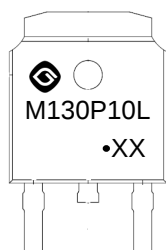
### Feature

- Split Gate Trench Technology
- Low  $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

### Application

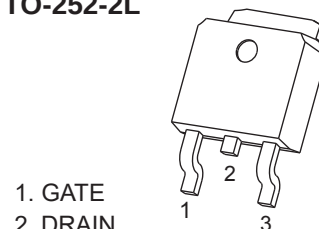
- Power Switching Application

### MARKING:



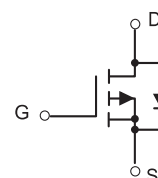
M130P10L = Device Code  
 XX = Date Code  
 Solid Dot = Green Indicator

TO-252-2L



1. GATE
2. DRAIN
3. SOURCE

Schematic diagram



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                |                           | Symbol          | Value     | Unit               |
|----------------------------------------------------------|---------------------------|-----------------|-----------|--------------------|
| Drain - Source Voltage                                   |                           | $V_{DS}$        | -100      | V                  |
| Gate - Source Voltage                                    |                           | $V_{GS}$        | ±20       | V                  |
| Continuous Drain Current <sup>1</sup>                    | $T_C = 25^\circ\text{C}$  | $I_D$           | -12       | A                  |
|                                                          | $T_C = 100^\circ\text{C}$ | $I_D$           | -9        | A                  |
| Pulsed Drain Current <sup>2</sup>                        |                           | $I_{DM}$        | -48       | A                  |
| Single Pulsed Avalanche Current <sup>3</sup>             |                           | $I_{AS}$        | -15       | A                  |
| Single Pulsed Avalanche Energy <sup>3</sup>              |                           | $E_{AS}$        | 56.3      | mJ                 |
| Power Dissipation <sup>5</sup>                           |                           | $P_D$           | 33        | W                  |
| $T_C = 25^\circ\text{C}$                                 |                           |                 |           |                    |
| Thermal Resistance from Junction to Ambient <sup>6</sup> |                           | $R_{\theta JA}$ | 56        | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Case                 |                           | $R_{\theta JC}$ | 3.75      | $^\circ\text{C/W}$ |
| Junction Temperature                                     |                           | $T_J$           | 150       | $^\circ\text{C}$   |
| Storage Temperature                                      |                           | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$   |

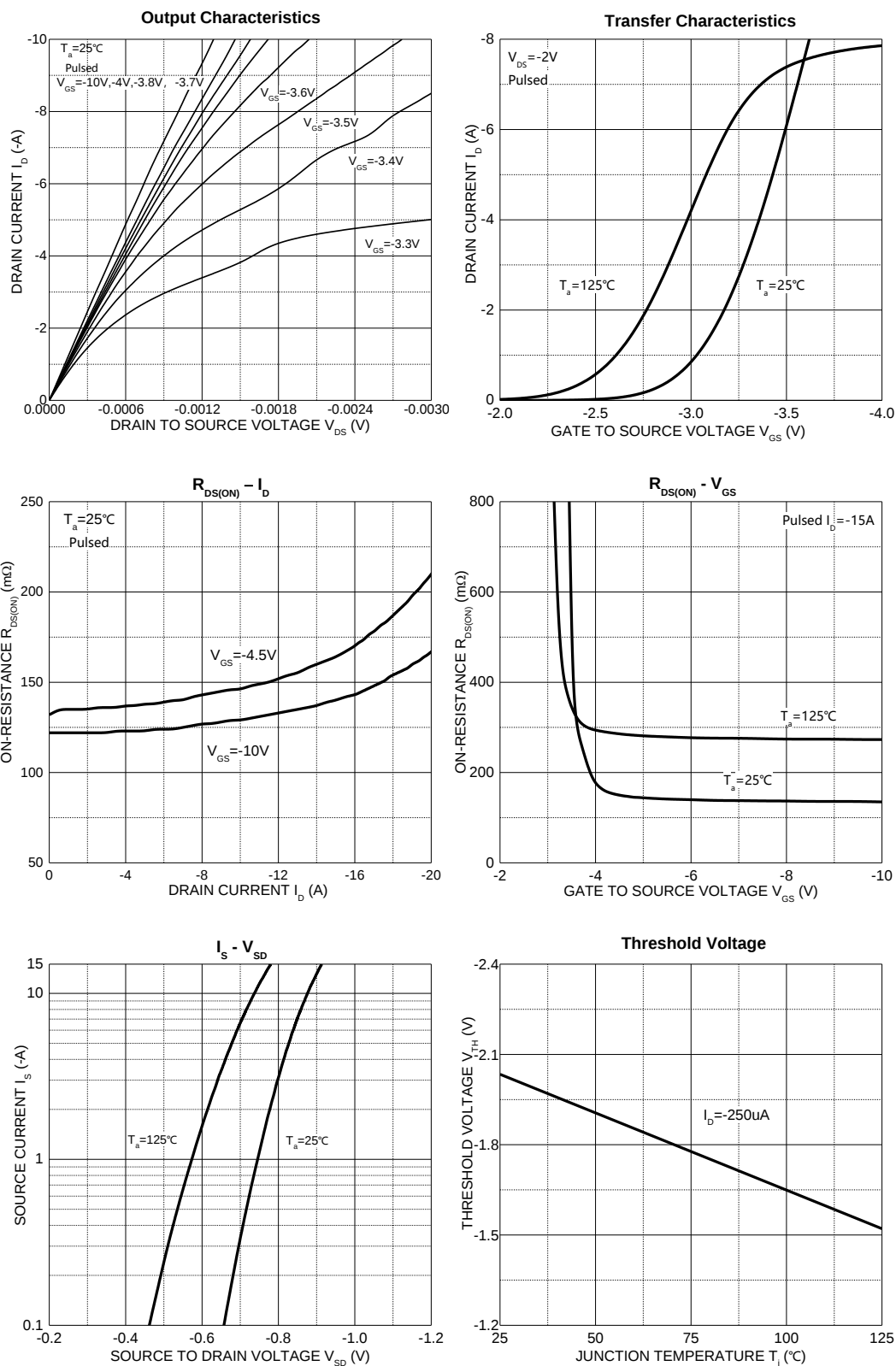
## MOSFET ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

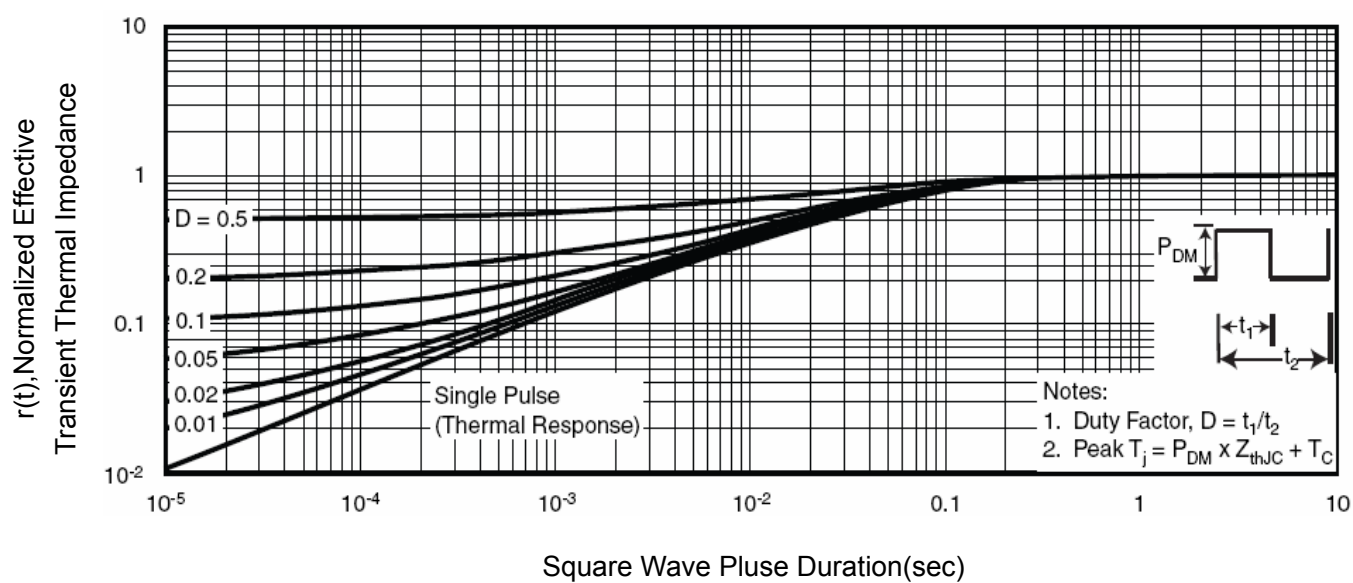
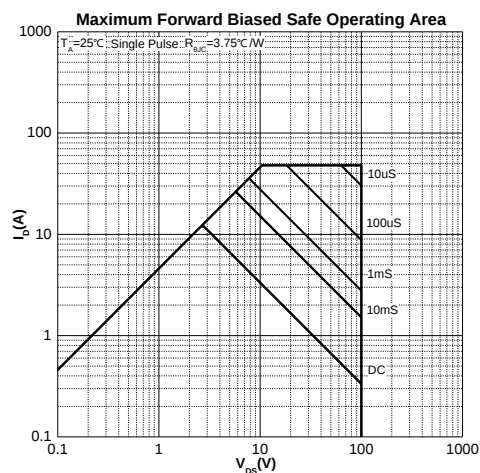
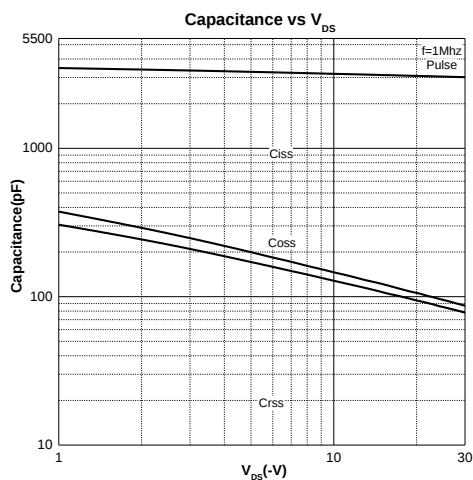
| Parameter                            | Symbol        | Test Condition                                              | Min  | Type | Max       | Unit       |
|--------------------------------------|---------------|-------------------------------------------------------------|------|------|-----------|------------|
| Off Characteristics                  |               |                                                             |      |      |           |            |
| Drain - Source Breakdown Voltage     | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$                              | -100 |      |           | V          |
| Zero Gate Voltage Drain Current      | $I_{DSS}$     | $V_{DS} = -100V, V_{GS} = 0V$                               |      |      | 1         | $\mu A$    |
| Gate - Body Leakage Current          | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                             |      |      | $\pm 100$ | nA         |
| On Characteristics <sup>4</sup>      |               |                                                             |      |      |           |            |
| Gate Threshold Voltage               | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                          | -1.0 | -2.0 | -3.0      | V          |
| Drain-source On-resistance           | $R_{DS(on)}$  | $V_{GS} = -10V, I_D = -15A$                                 |      | 145  | 168       | m $\Omega$ |
| Forward Transconductance             | $g_{FS}$      | $V_{DS} = -5V, I_D = -5A$                                   | 12   |      |           | S          |
| Dynamic Characteristics              |               |                                                             |      |      |           |            |
| Input Capacitance                    | $C_{iss}$     | $V_{DS} = -45V, V_{GS} = 0V, f = 1MHz$                      |      | 2926 |           | pF         |
| Output Capacitance                   | $C_{oss}$     |                                                             |      | 72   |           |            |
| Reverse Transfer Capacitance         | $C_{rss}$     |                                                             |      | 66   |           |            |
| Gate Resistance                      | $R_g$         | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$                        |      | 9.1  |           | $\Omega$   |
| Switching Characteristics            |               |                                                             |      |      |           |            |
| Total Gate Charge                    | $Q_g$         | $V_{DS} = -55V, V_{GS} = -10V, I_D = -15A$                  |      | 55   |           | nC         |
| Gate-source Charge                   | $Q_{gs}$      |                                                             |      | 10   |           |            |
| Gate-drain Charge                    | $Q_{gd}$      |                                                             |      | 11   |           |            |
| Turn-on Delay Time                   | $t_{d(on)}$   | $V_{DD} = -50V, V_{GS} = -10V, I_D = -10A, R_G = 9.1\Omega$ |      | 11   |           | ns         |
| Turn-on Rise Time                    | $t_r$         |                                                             |      | 50   |           |            |
| Turn-off Delay Ttime                 | $t_{d(off)}$  |                                                             |      | 24   |           |            |
| Turn-off Fall Time                   | $t_f$         |                                                             |      | 35   |           |            |
| Source - Drain Diode Characteristics |               |                                                             |      |      |           |            |
| Diode Forward Voltage <sup>4</sup>   | $V_{SD}$      | $V_{GS} = 0V, I_S = -10A$                                   |      |      | -1.2      | V          |
| Diode Reverse Recovery Time          | $t_{rr}$      | $I_F = -10A, dI/dt = 500A/ms$                               |      | 33   |           | ns         |
| Diode Reverse Recovery Charge        | $Q_{rr}$      | $I_F = -10A, dI/dt = 500A/ms$                               |      | 45   |           | nC         |

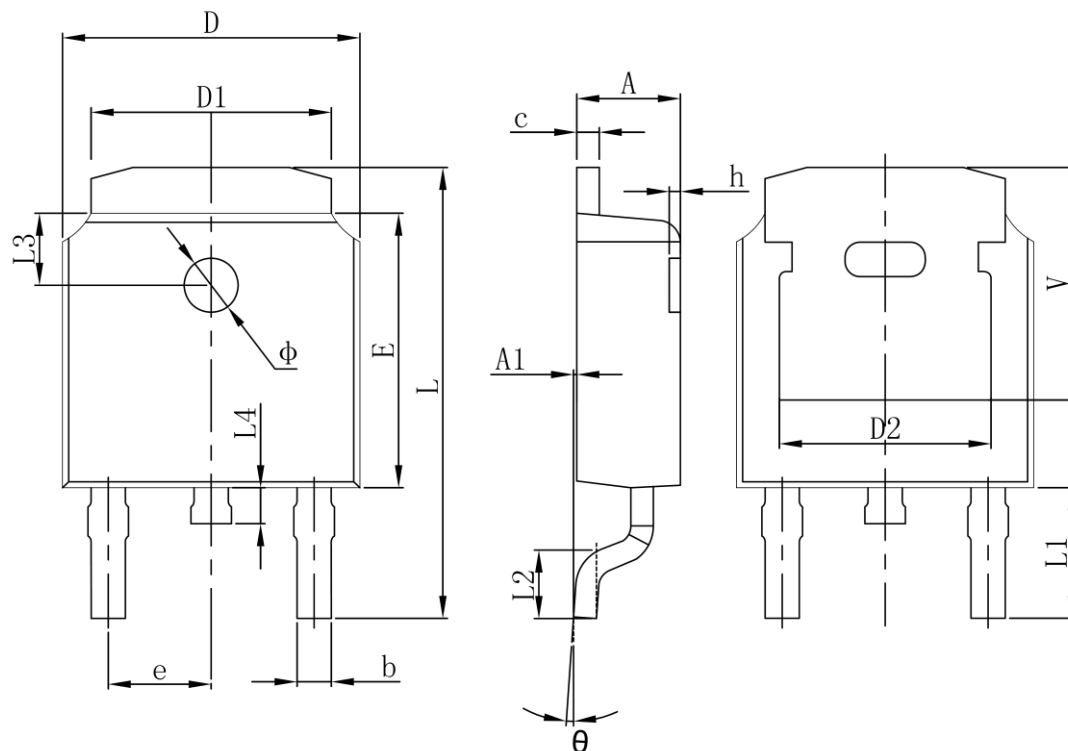
Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
- 3.EAS condition:  $V_{DD} = -50V, V_{GS} = -10V, L = 0.5mH, R_G = 25\Omega$  Starting  $T_J = 25^\circ\text{C}$ .
- 4.Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 5.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ .And device mounted on a large heatsink
- 6.Device mounted on  $1in^2$  FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

## Typical Characteristics





**TO-252-2L Package Information**


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.635                     | 0.770  | 0.025                | 0.030 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 4.830REF                  |        | 0.190REF             |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.712                     | 10.312 | 0.382                | 0.406 |
| L1     | 2.900REF                  |        | 0.114REF             |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600REF                  |        | 0.063REF             |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.250REF                  |        | 0.207REF             |       |