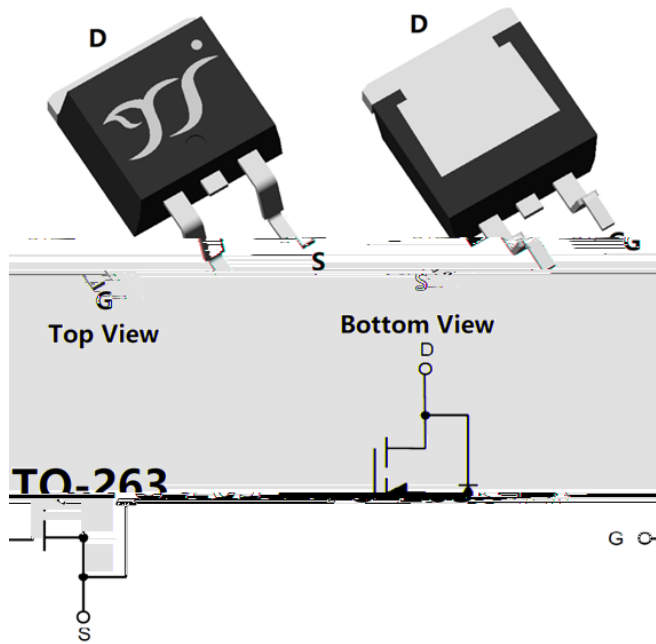


## N-Channel Enhancement Mode Field Effect Transistor



### Product Summary

|                                   |      |
|-----------------------------------|------|
| $V_{DS}$                          | 100V |
| $I_D$                             | 130A |
| $R_{DS(ON)}$ ( at $V_{GS}=10V$ )  | 5m   |
| $R_{DS(ON)}$ ( at $V_{GS}=4.5V$ ) | 6m   |
| 100% EAS Tested                   |      |
| 100% VDS Tested                   |      |

### General Description

Split gate trench MOSFET technology  
 Excellent package for heat dissipation  
 High density cell design for low  $R_{DS(ON)}$   
 Moisture Sensitivity Level 1  
 Epoxy Meets UL 94 V-0 Flammability Rating  
 Halogen Free

### Applications

Power switching application  
 Uninterruptible power supply  
 DC-DC

T

M rent

|  |           |                |          |    |
|--|-----------|----------------|----------|----|
|  | $T_A=25$  | $I_D$          | 16       | A  |
|  | $T_A=100$ |                | 10       |    |
|  | $T_C=25$  |                | 130      |    |
|  | $T_C=100$ |                | 82       |    |
| Pulsed Drain Current <sup>A</sup>      |           | $I_{DM}$       | 520      | A  |
| Avalanche energy <sup>B</sup>          |           | EAS            | 360      | mJ |
| Total Power Dissipation <sup>C</sup>   | $T_A=25$  | $P_D$          | 2.7      | W  |
|  | $T_A=100$ |                | 1.1      |    |
|  | $T_C=25$  |                | 190      |    |
|  | $T_C=100$ |                | 77       |    |
| Junction and Storage Temperature Range |           | $T_J, T_{STG}$ | -55 +150 |    |

### Thermal resistance

| Parameter   |              | Symbol   | Typ | Max  | Units |
|---|--------------|----------|-----|------|-------|
| Thermal Resistance Junction-to-Ambient <sup>D</sup> | Steady-State | $R_{JA}$ | 35  | 45   | /W    |
| Thermal Resistance Junction-to-Case                 | Steady-State | $R_{JC}$ | 0.5 | 0.65 |       |

### Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking    | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|------------|----------------------|-------------------------|----------------------------|---------------|
| YJB130G10A    | F2           | YJB130G10A | 800                  | /                       | 8000                       | 13" reel      |



# YJB130G10A

## Electrical Characteristics (T<sub>J</sub>=25 unless otherwise noted)

| Parameter                             | Symbol              | Conditions   | Min | Typ  | Max  | Units |
|---------------------------------------|---------------------|--|-----|------|------|-------|
| <b>Static Parameter</b>               |                     |  |     |      |      |       |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA  | 100 | -    | -    | V     |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V   | -   | -    | 1    | μA    |
|                                       |                     | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =150                          | -   | -    | 100  |       |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V  | -   | -    | ±100 | nA    |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                                | 1   | 1.8  | 2.5  | V     |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =65A  | -   | 3.5  | 5    | m     |
|                                       |                     | V <sub>GS</sub> =10V, I <sub>D</sub> =20A  | -   | 3.5  | 5    |       |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A   | -   | 4.5  | 6    |       |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =65A, V <sub>GS</sub> =0V   | -   | 0.9  | 1.2  | V     |
| Gate resistance                       | R <sub>G</sub>      | f=1MHz, Open drain   | -   | 0.8  | -    |       |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |  | -   | -    | 130  | A     |
| <b>Dynamic Parameters</b>             |                     |  |     |      |      |       |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz  | -   | 4450 | -    | pF    |
| Output Capacitance                    | C <sub>oss</sub>    |  | -   | 1650 | -    |       |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |  | -   | 30   | -    |       |
| <b>Switching Parameters</b>           |                     |  |     |      |      |       |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =65A                          | -   | 70   | -    | nC    |
| Gate-Source Charge                    | Q <sub>gs</sub>     |  | -   | 10   | -    |       |
| Gate-Drain Charge                     | Q <sub>gd</sub>     |  | -   | 15   | -    |       |
| Reverse Recovery Charge               | Q <sub>rr</sub>     | I <sub>F</sub> =65A, di/dt=600A/us   | -   | 160  | -    | nC    |
| Reverse Recovery Time                 | t <sub>rr</sub>     |  | -   | 35   | -    | ns    |
| Turn-on Delay Time                    | t <sub>D(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =65A<br>R <sub>GEN</sub> =2.2 | -   | 20   | -    | ns    |
| Turn-on Rise Time                     | t <sub>r</sub>      |  | -   | 80   | -    |       |
| Turn-off Delay Time                   | t <sub>D(off)</sub> |  | -   | 30   | -    |       |
| Turn-off fall Time                    | t <sub>f</sub>      |  | -   | 8    | -    |       |

A. Repetitive rating; pulse width limited by max. junction temperature.

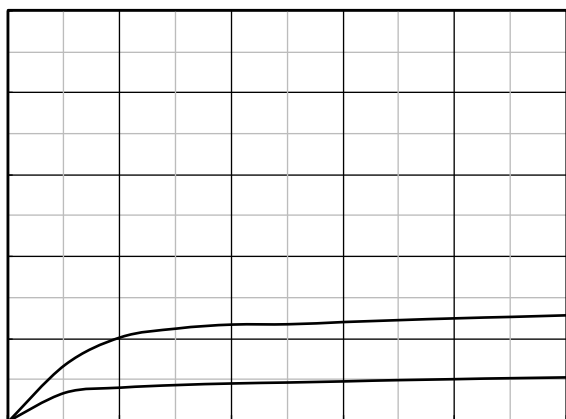
B. T<sub>J</sub>=25, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25, L=0.5mH, I<sub>AS</sub>=38A.

C. P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.

D. The value of R<sub>JA</sub> is measured with the device mounted on the minimum recommend pad size, in the still air environment with T<sub>A</sub>=25. The maximum allowed junction temperature of 150. The value in any given application depends on the user's specific board design.



■ Typical Electrical and Thermal Characteristics Diagrams





# YJB130G10A

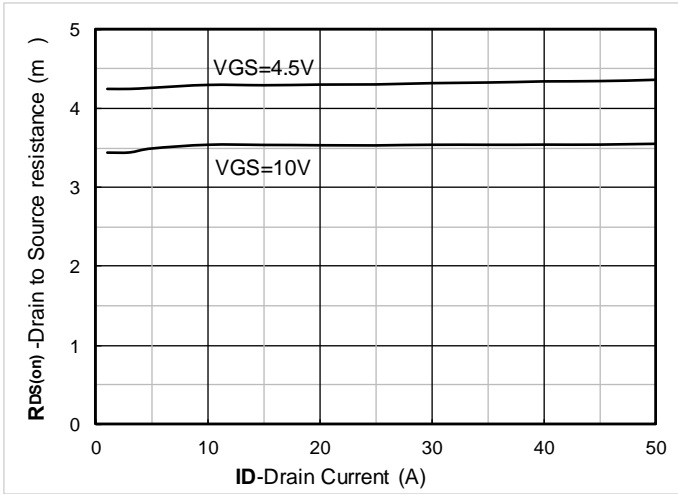


Figure 7. RDS(on) VS Drain Current

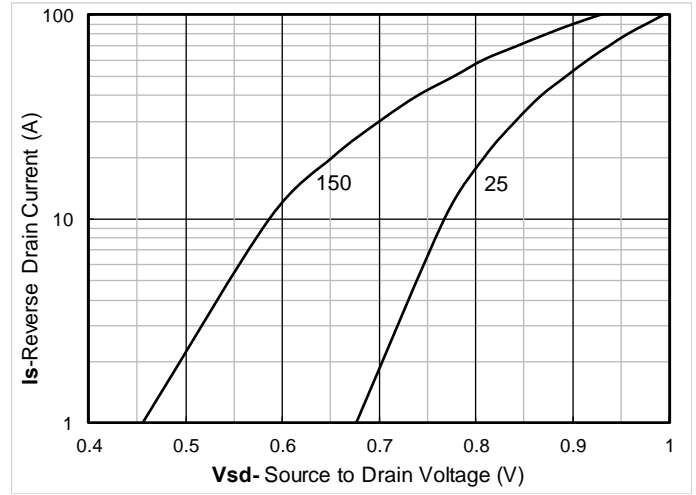


Figure 8. Forward characteristics of reverse diode

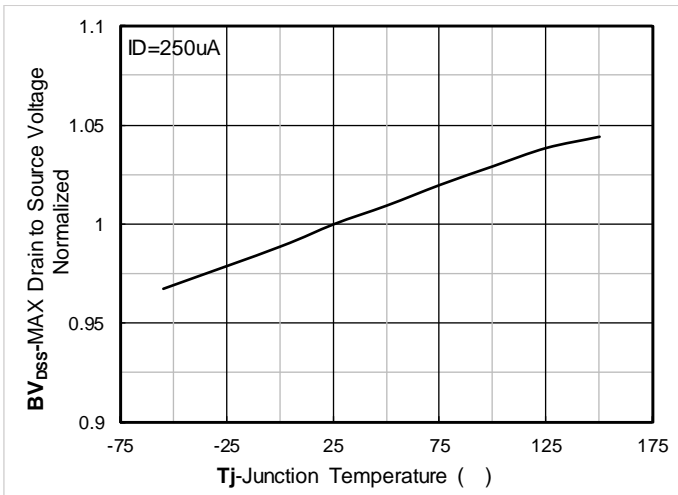


Figure 9. Normalized breakdown voltage

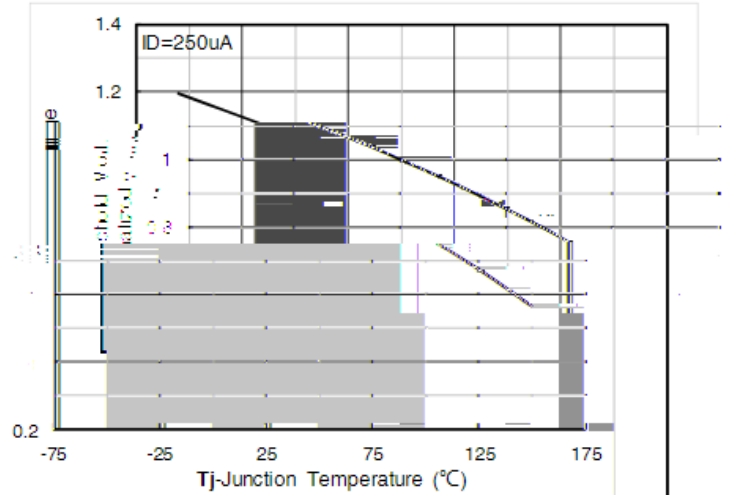


Figure 10. Normalized Threshold voltage

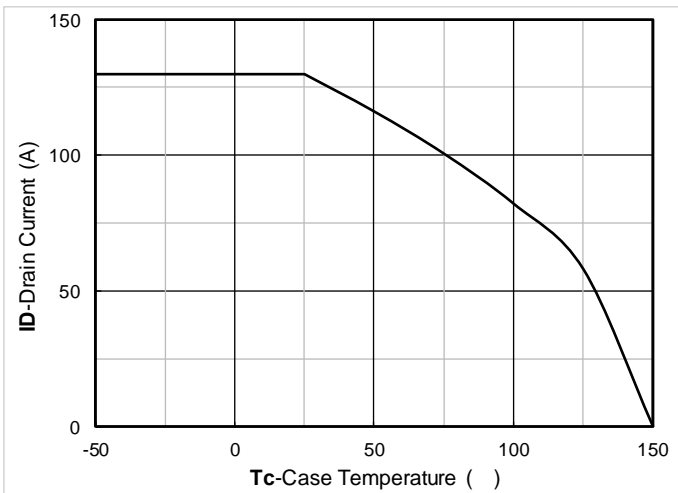


Figure 11. Current dissipation

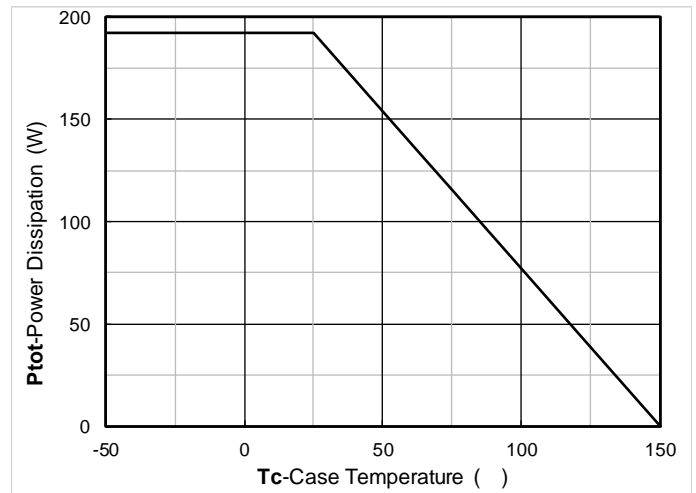
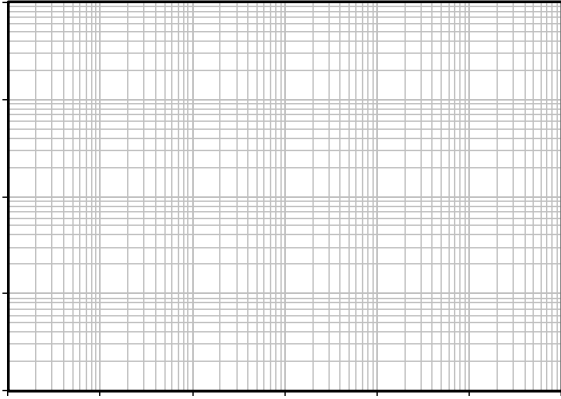


Figure 12. Power dissipation



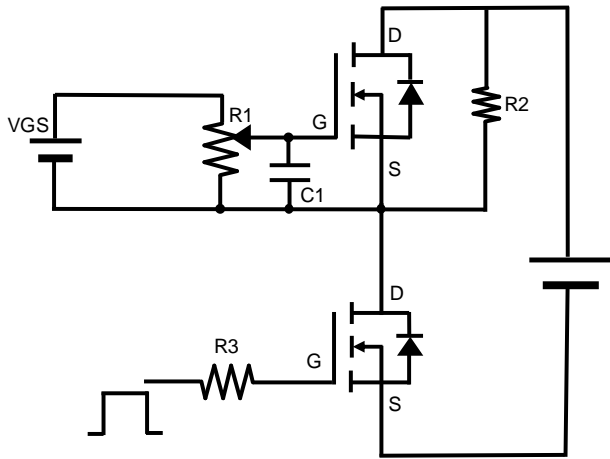


Figure B. Gate Charge Test Circuit & Waveform

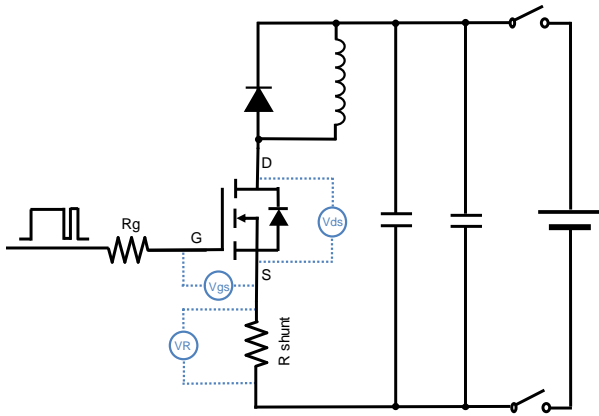


Figure C. Resistive Switching Test Circuit & Waveform

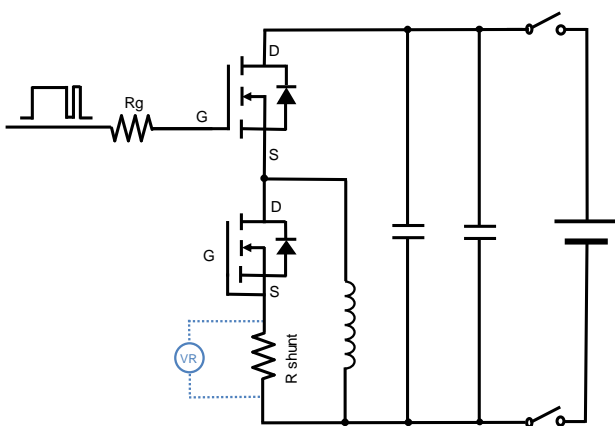
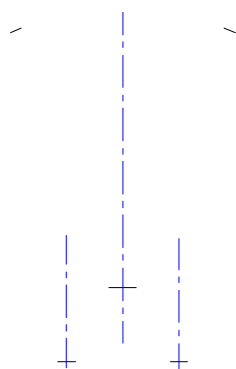
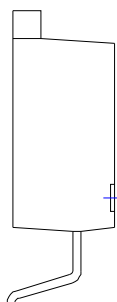
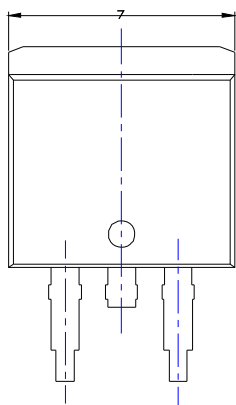


Figure D. Diode Recovery Test Circuit & Waveform



# YJB130G10A

## TO-263-HY Package information



| SYMBOL | DIMENSIONS |       |       |            |        |        |
|--------|------------|-------|-------|------------|--------|--------|
|        | INCHES     |       |       | Millimeter |        |        |
|        | MIN.       | NDM.  | MAX.  | MIN.       | NDM.   | MAX.   |
| A1     | 0.000      | ---   | 0.010 | 0.000      | ---    | 0.250  |
| A2     | 0.174      | 0.180 | 0.186 | 4.430      | 4.580  | 4.730  |
| b      | 0.028      | 0.032 | 0.036 | 0.720      | 0.820  | 0.920  |
| b2     | 0.046      | 0.050 | 0.054 | 1.180      | 1.280  | 1.380  |
| c      | 0.013      | 0.015 | 0.018 | 0.330      | 0.390  | 0.450  |
| c2     | 0.048      | 0.050 | 0.053 | 1.220      | 1.280  | 1.340  |
| D1     | 0.295      | 0.307 | 0.319 | 7.500      | 7.800  | 8.100  |
| D2     | 0.303      | 0.315 | 0.327 | 7.700      | 8.000  | 8.300  |
| E      | 0.571      | 0.591 | 0.610 | 14.500     | 15.000 | 15.500 |
| E1     | 0.337      | 0.341 | 0.348 | 8.550      | 8.700  | 8.850  |
| E2     | 0.276      | 0.287 | 0.299 | 7.000      | 7.300  | 7.600  |
| e      | 0.200BSC   |       |       | 5.080BSC   |        |        |
| L      | 0.070      | ---   | 0.110 | 1.790      | ---    | 2.790  |
| L1     | 0.044      | ---   | 0.056 | 1.120      | ---    | 1.420  |
| L2     | 0.030      | ---   | 0.070 | 0.770      | ---    | 1.770  |
| L3     | 0.197REF   |       |       | 5.000REF   |        |        |
|        | 0°         | ---   | 8°    | 0°         | ---    | 8°     |

### NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

UNIT mm



## YJB130G10A

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