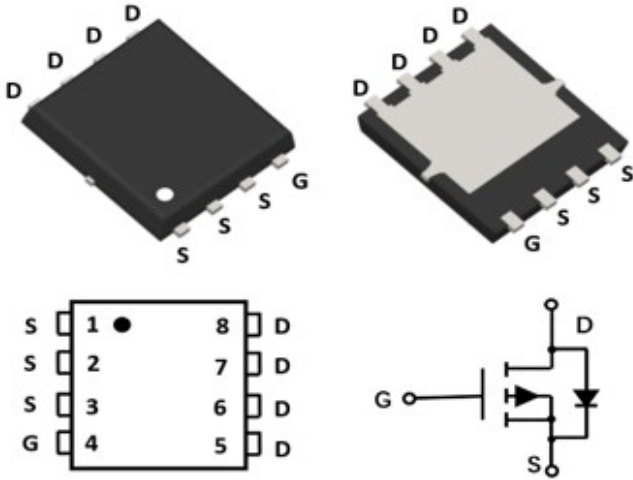


P-Channel Enhancement Mode Field Effect Transistor

PDFN 5X6



Product Summary

- V_{DS} -100V
- I_D -15A
- $R_{DS(ON)}$ (at $V_{GS}=-10V$) <90 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) <110 mohm
- 100% UIS Tested
- 100% ∇V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|----------------------------------------|-------------------------|----------------|----------|------------------|
| Drain-source Voltage | | V_{DS} | -100 | V |
| Gate-source Voltage | | V_{GS} | ± 20 | V |
| Drain Current | $T_c=25^\circ\text{C}$ | I_D | -15 | A |
| | $T_c=100^\circ\text{C}$ | | -9.6 | |
| Pulsed Drain Current ^A | | I_{DM} | -30 | A |
| Avalanche energy ^B | | E_{AS} | 130 | mJ |
| Total Power Dissipation ^C | $T_c=25^\circ\text{C}$ | P_D | 60 | W |
| | $T_c=100^\circ\text{C}$ | | 24 | |
| Junction and Storage Temperature Range | | T_J, T_{STG} | -55~+150 | $^\circ\text{C}$ |

■ Thermal resistance

| Parameter | | Symbol | Typ | Max | Units |
|-----------------------------------------------------|---------------------|-----------------|-----|-----|--------------------|
| Thermal Resistance Junction-to-Ambient ^D | $t \leq 10\text{S}$ | $R_{\theta JA}$ | 15 | 20 | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Ambient ^D | Steady-State | | 40 | 50 | |
| Thermal Resistance Junction-to-Case | Steady-State | $R_{\theta JC}$ | 1.7 | 2.1 | |

■ Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|------------|----------------------|-------------------------|----------------------------|---------------|
| YJG15GP10A | F1 | YJG15GP10A | 5000 | 10000 | 100000 | 13" reel |



YJG15GP10A

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

| | Symbol | Conditions | Min | Typ | Max | Units |
|---------------------------------------|-----------------------|--------------------------------------------------------------------------------------------|----------------------|------|-------|-------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} = 0V, I _D =-250μA | -100 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-100V, V _{GS} =0V | T _J =25°C | | -1 | μA |
| | | | T _J =55°C | | -5 | |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} = ±20V, V _{DS} =0V | | | ± 100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D =-250μA | -1.0 | -1.8 | -2.5 | V |
| Static Drain-Source On-Resistance | R _{D(S)ON} | V _{GS} = -10V, I _D =-15A | | 75 | 90 | mΩ |
| | | V _{GS} = -4.5V, I _D =-7A | | 85 | 110 | |
| Diode Forward Voltage | V _{SD} | I _S =-15A, V _{GS} =0V | | | -1.3 | V |
| Maximum Body-Diode Continuous Current | I _S | | | | -15 | A |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =-50V, V _{GS} =0V, f=1MHZ | | 1051 | | pF |
| Output Capacitance | C _{oss} | | | 119 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 25 | | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q _{g(-10V)} | V _{GS} =-10V, V _{DS} =-50V, I _D =-5A | | 20.1 | | nC |
| Total Gate Charge | Q _{g(-4.5V)} | | | 9.7 | | |
| Gate-Source Charge | Q _{gs} | | | 3.9 | | |
| Gate-Drain Charge | Q _{gd} | | | 4.3 | | |
| Reverse Recovery Charge | Q _{rr} | I _F =-5A, di/dt=100A/us | | 140 | | |
| Reverse Recovery Time | t _{rr} | | | 80 | | |
| Turn-on Delay Time | t _{D(on)} | V _{GS} =-10V, V _{DD} =-50V, I _{DS} =-5A R _{GEN} =6Ω | | 10 | | ns |
| Turn-on Rise Time | t _r | | | 30 | | |
| Turn-off Delay Time | t _{D(off)} | | | 77 | | |
| Turn-off fall Time | t _f | | | 81 | | |

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

B. V_{DD}=50V, R_G=25Ω, L=0.5mH.

C. Pd is based on max. junction temperature, using junction-case thermal resistance.

D. The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25° C. The Power dissipation PDSM is based on RθJA ≤ 10s and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design.



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■ Typical Performance Characteristics

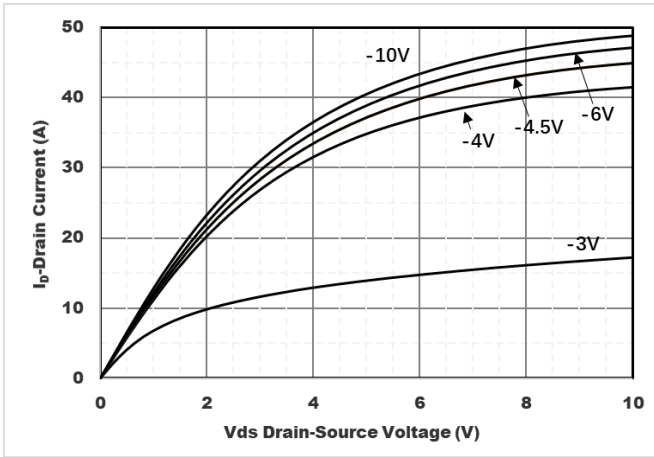


Figure1. Output Characteristics

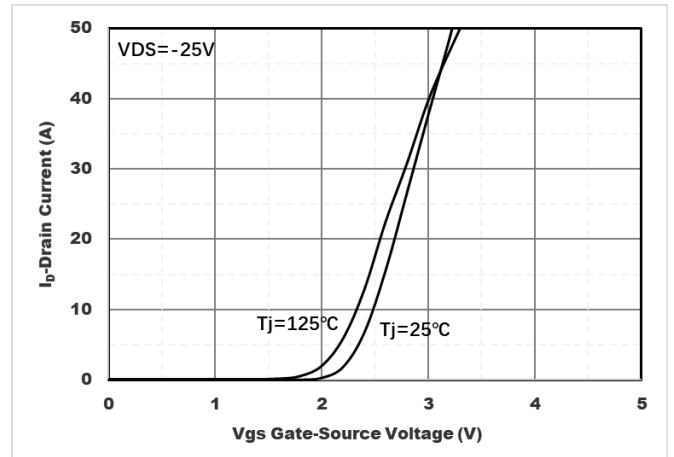


Figure2. Transfer Characteristics

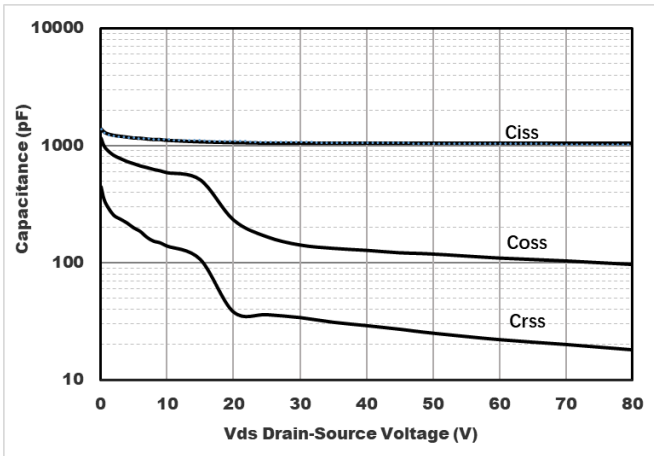


Figure3. Capacitance Characteristics

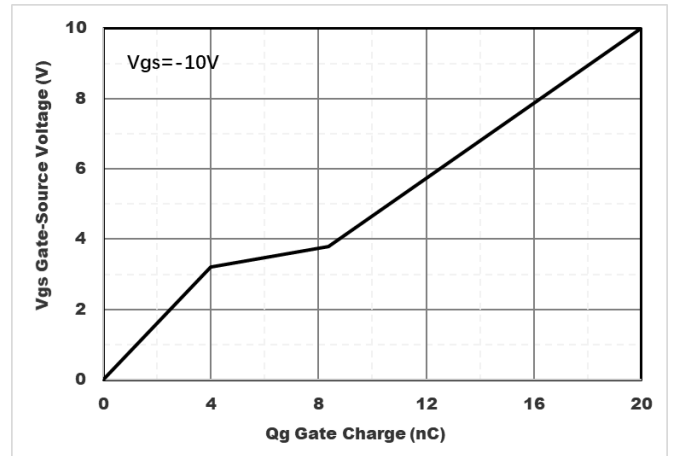


Figure4. Gate Charge

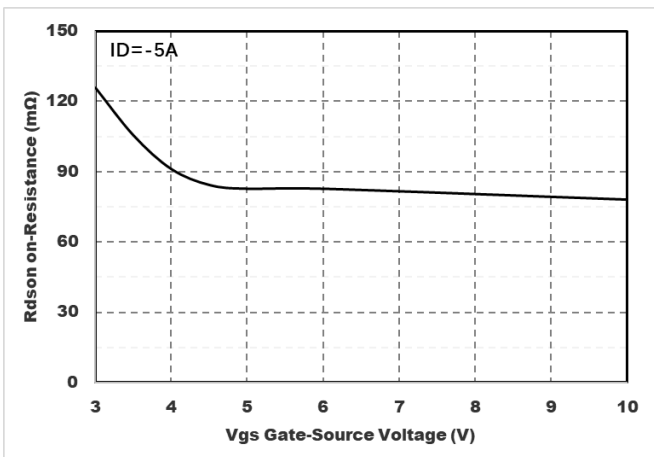


Figure5. : On-Resistance vs. Gate to Source Voltage

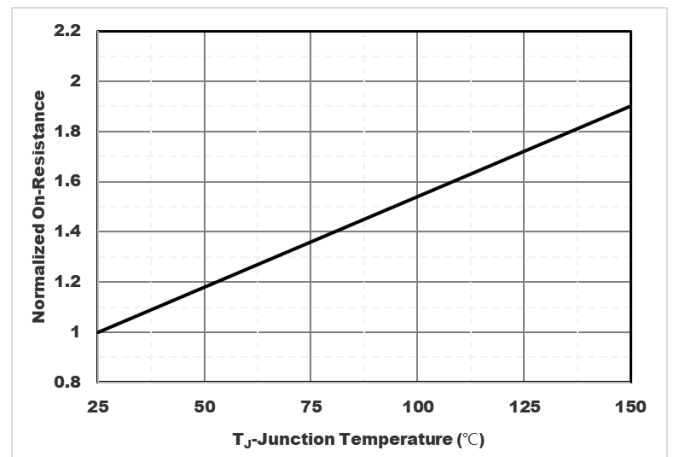


Figure6. Normalized On-Resistance



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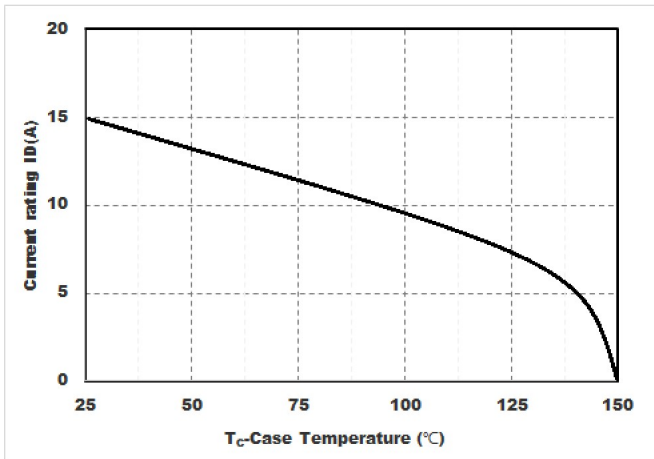


Figure7. Drain current

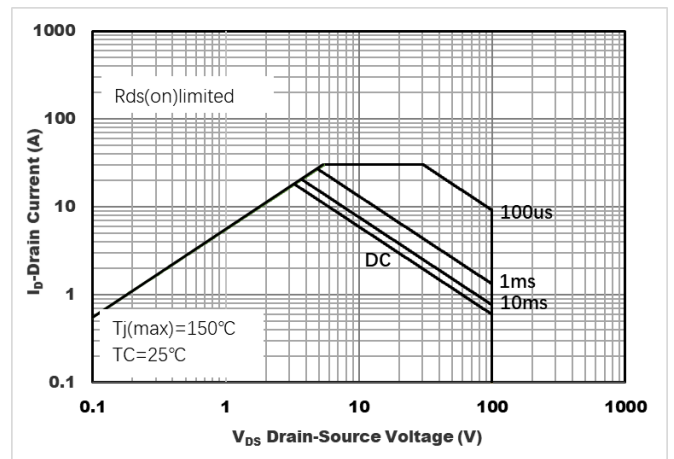


Figure8.Safe Operation Area

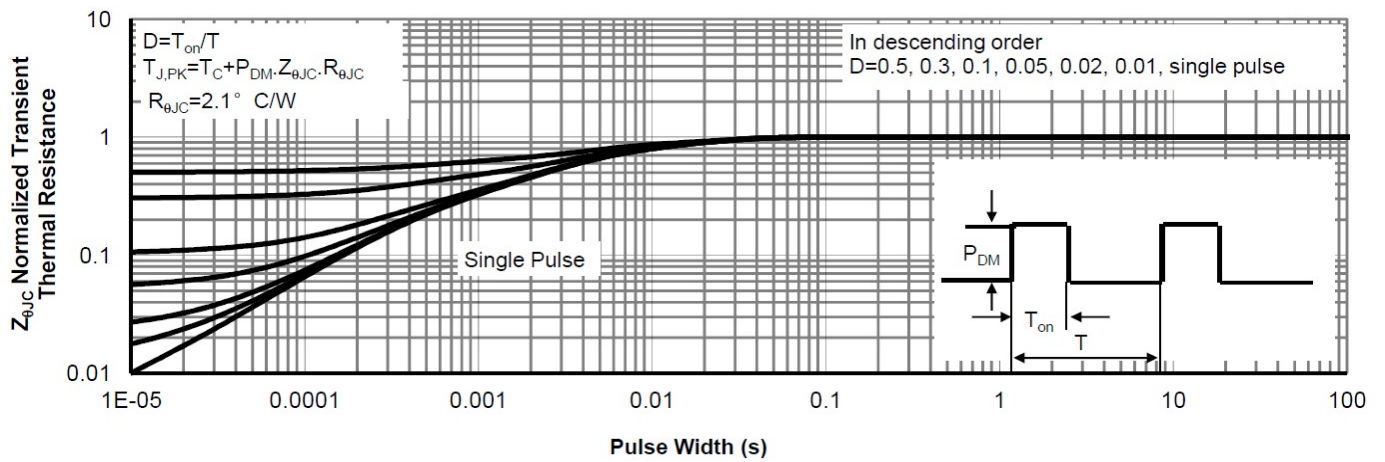
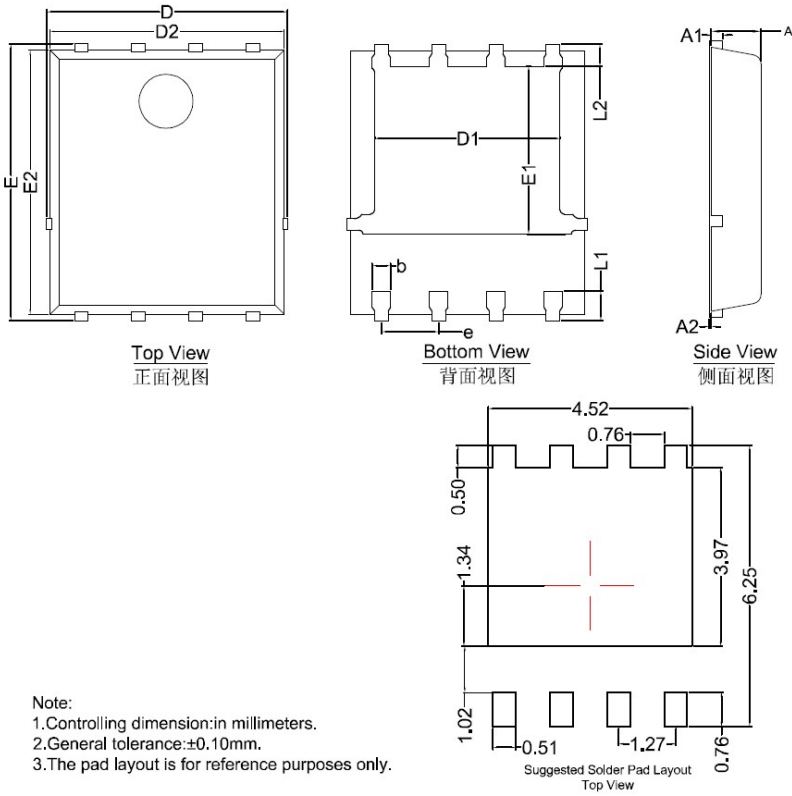


Figure9.Normalized Maximum Transient thermal impedance



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■ PDFN5x6 Package information



| SYMBOL | MILLIMETER | | |
|--------|------------|------|------|
| | MIN | NOM | MAX |
| D | 5.15 | 5.35 | 5.55 |
| E | 5.95 | 6.15 | 6.35 |
| A | 1.00 | 1.10 | 1.20 |
| A1 | 0.254 BSC | | |
| A2 | | | 0.10 |
| D1 | 3.92 | 4.12 | 4.32 |
| E1 | 3.52 | 3.72 | 3.92 |
| D2 | 5.00 | 5.20 | 5.40 |
| E2 | 5.66 | 5.86 | 6.06 |
| L1 | 0.56 | 0.66 | 0.76 |
| L2 | 0.50 BSC | | |
| b | 0.31 | 0.41 | 0.51 |
| e | 1.27 BSC | | |

Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.10 mm.
 3. The pad layout is for reference purposes only.



YJG15GP10A

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