



Description

The HBUK721955A118 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 60V$ $I_D = 50A$

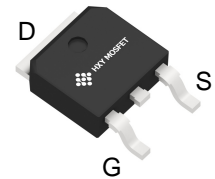
$R_{DS(ON)} < 17m\Omega$ @ $V_{GS}=10V$

Application

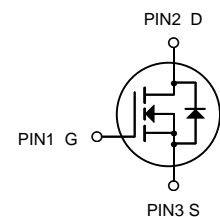
Battery protection

Load switch

Uninterruptible power supply



**TO-252-2L
(DPAK)**



N-Channel MOSFET

Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|----------------|-----------------|------------|----------|
| HBUK721955A118 | TO-252-2L(DPAK) | HXY MOSFET | 2500 |

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

| Symbol | Parameter | Rating | Units |
|------------------------|---|------------|---------------|
| V_{DS} | Drain-Source Voltage | 60 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D@T_C=25^{\circ}C$ | Continuous Drain Current, V_{GS} @ 10V ¹ | 50 | A |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current, V_{GS} @ 10V ¹ | 38 | A |
| I_{DM} | Pulsed Drain Current ² | 180 | A |
| EAS | Single Pulse Avalanche Energy ³ | 280 | mJ |
| I_{AS} | Avalanche Current | 28 | A |
| $P_D@T_C=25^{\circ}C$ | Total Power Dissipation ⁴ | 87.7 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^{\circ}C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^{\circ}C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ¹ | 62 | $^{\circ}C/W$ |



Electrical Characteristics ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---------------------|---|-----|------|------|------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V I _D =250μA | 60 | - | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =60V,V _{GS} =0V | - | - | 1 | μA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±20V,V _{DS} =0V | - | - | ±100 | nA |
| On Characteristics ^(Note 3) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} ,I _D =250μA | 1.0 | 1.5 | 2.5 | V |
| Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =30A | - | 13 | 17 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =5V,I _D =30A | 30 | - | - | S |
| Dynamic Characteristics ^(Note4) | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =25V,V _{GS} =0V, F=1.0MHz | - | 2498 | - | PF |
| Output Capacitance | C _{oss} | | - | 185 | - | PF |
| Reverse Transfer Capacitance | C _{rss} | | - | 80 | - | PF |
| Switching Characteristics ^(Note 4) | | | | | | |
| Turn-on Delay Time | t _{d(on)} | V _{DD} =30V,I _D =2A,R _L =1Ω V _{GS} =10V,R _{GEN} =3Ω | - | 12 | - | nS |
| Turn-on Rise Time | t _r | | - | 5.2 | - | nS |
| Turn-Off Delay Time | t _{d(off)} | | - | 38 | - | nS |
| Turn-Off Fall Time | t _f | | - | 27 | - | nS |
| Total Gate Charge | Q _g | V _{DS} =30V,I _D =30A, V _{GS} =10V | - | 36 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 9.9 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 6.6 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ^(Note 3) | V _{SD} | V _{GS} =0V,I _S =30A | - | - | 1.2 | V |
| Diode Forward Current ^(Note 2) | I _S | | - | - | 58 | A |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F =30A di/dt = 100A/μs ^(Note3) | - | 35 | | nS |
| Reverse Recovery Charge | Q _{rr} | | - | 47 | | nC |
| Forward Turn-On Time | t _{on} | Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD) | | | | |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$



Typical Electrical and Thermal Characteristics (Curves)

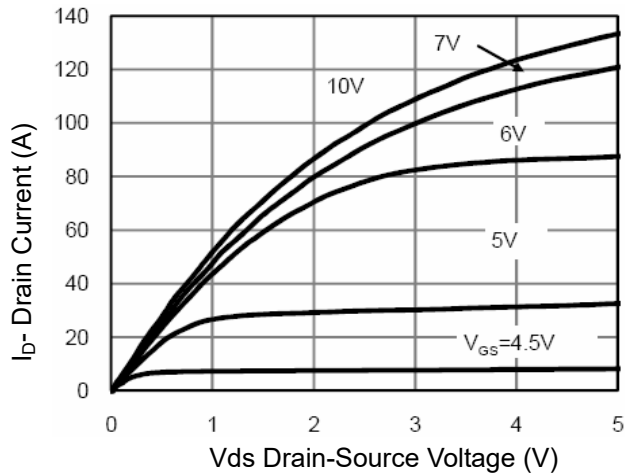


Figure 1 Output Characteristics

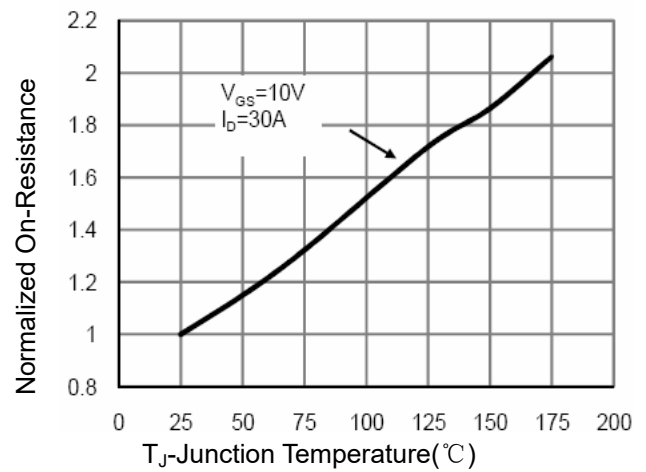


Figure 4 Rdson-Junction Temperature

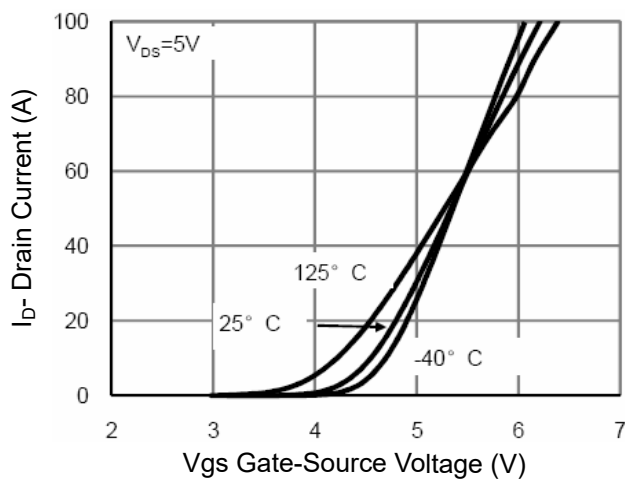


Figure 2 Transfer Characteristics

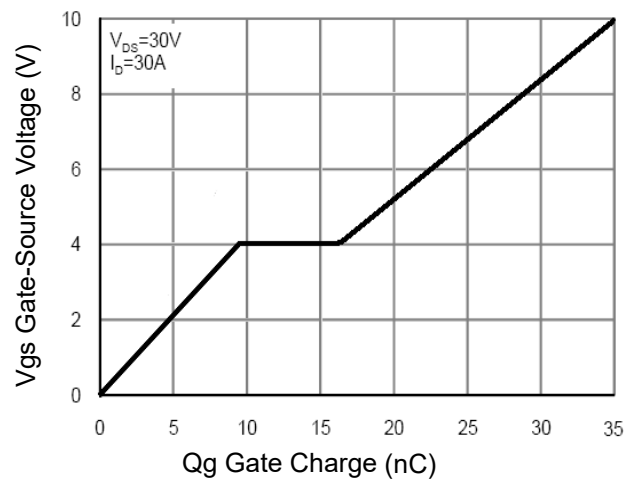


Figure 5 Gate Charge

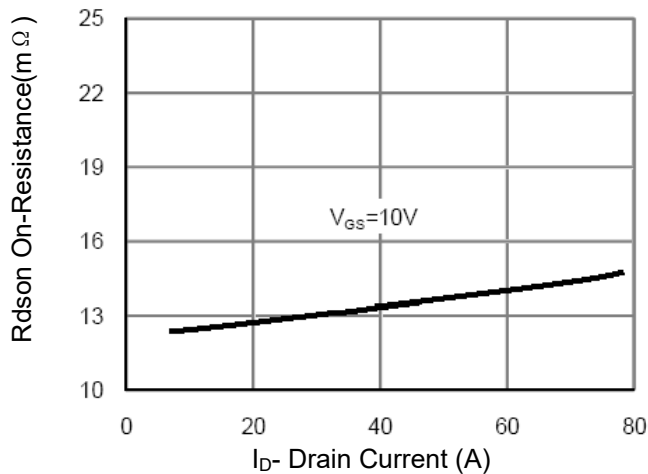


Figure 3 Rdson- Drain Current

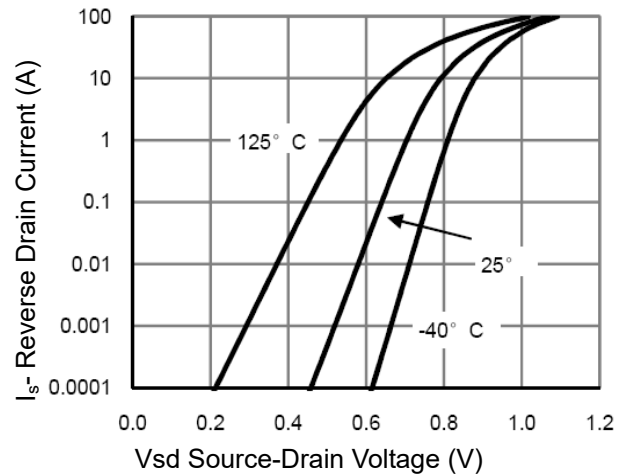


Figure 6 Source- Drain Diode Forward

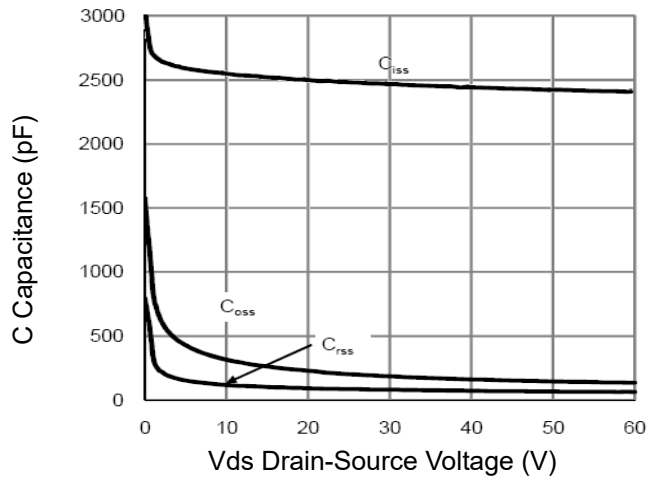


Figure 7 Capacitance vs Vds

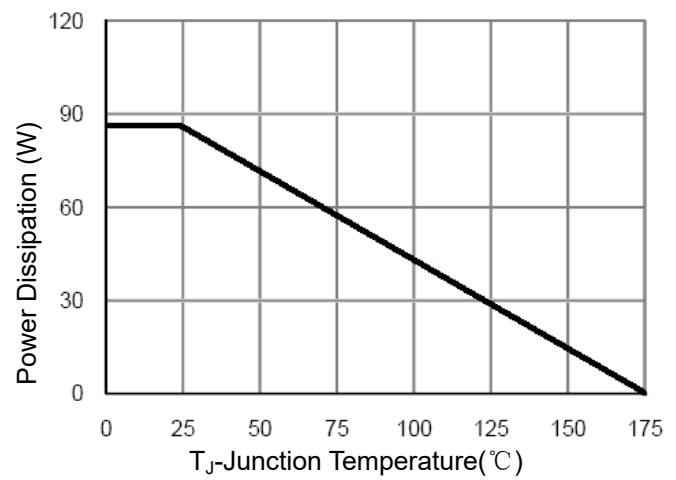


Figure 9 Power De-rating

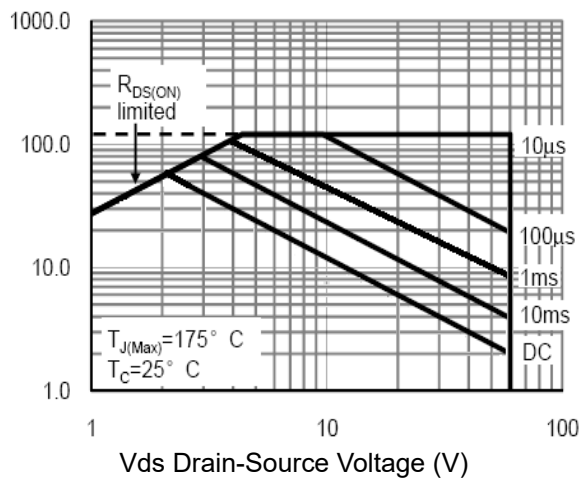


Figure 8 Safe Operation Area

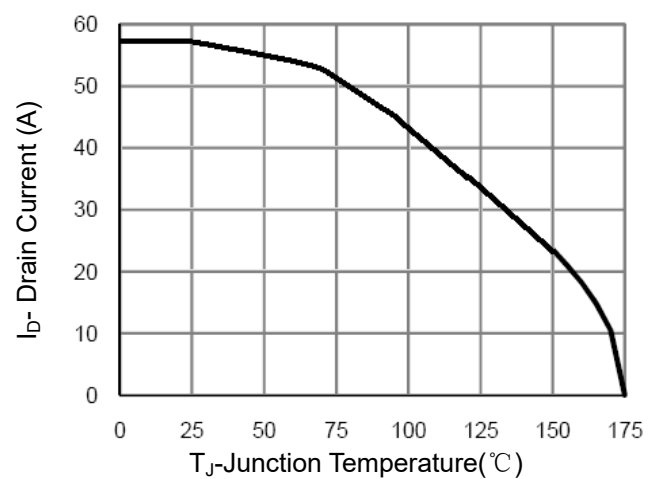
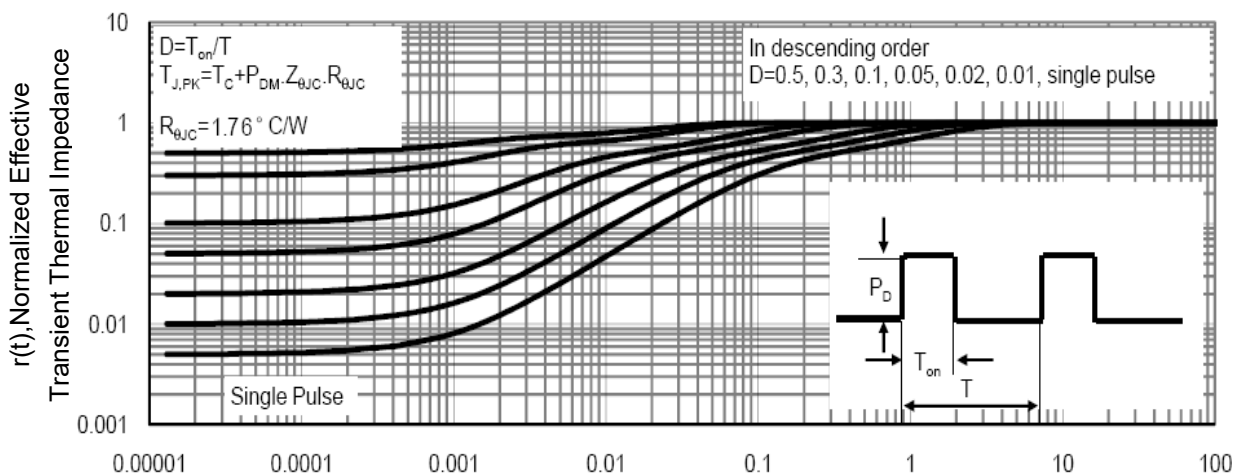
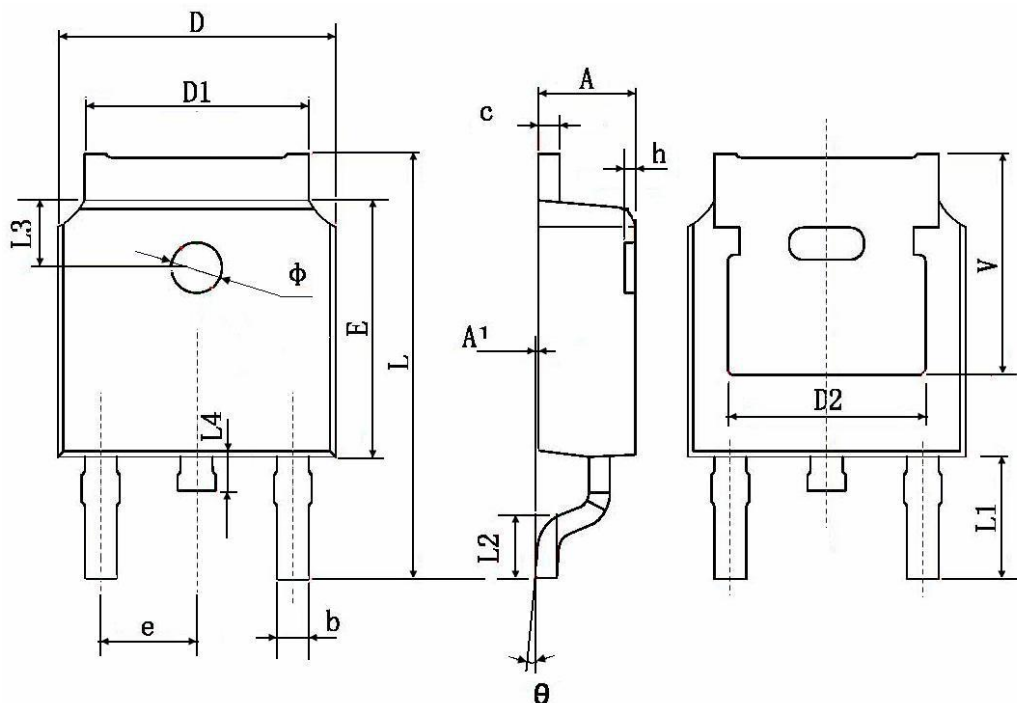


Figure 10 ID Current- Junction Temperature





TO-252-2L(DPAK) 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 | 0.660 | 0.860 | 0.026 | 0.034 |
| 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 | 0.483 TYP. | | 0.190 TYP. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 TYP. | | 0.114 TYP. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 TYP. | | 0.063 TYP. | |
| 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 | 5.350 TYP. | | 0.211 TYP. | |



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