

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

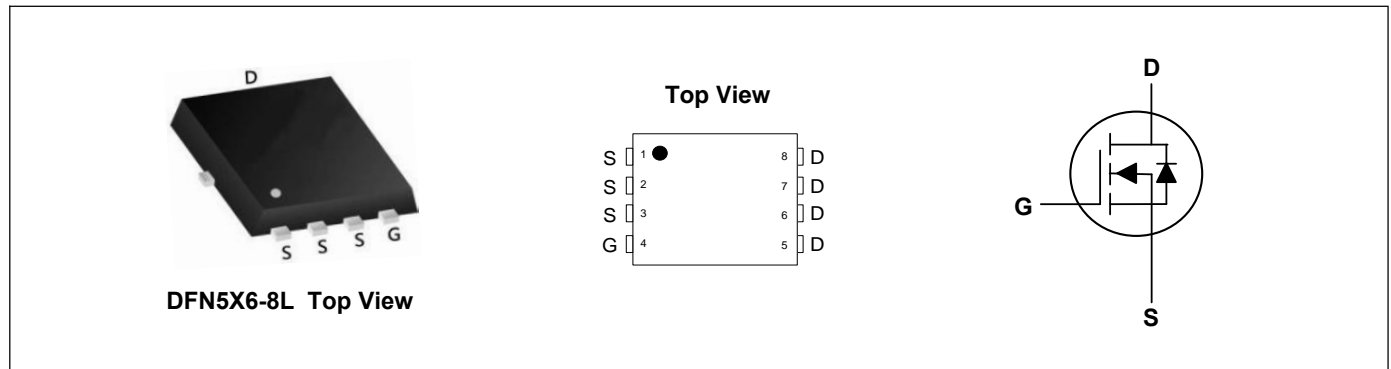
Applications

- High Frequency Point-of-Load, Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switching

Product Summary



| | | |
|----------------------------------|------|------------|
| V_{DS} | 40 | V |
| I_D | 150 | A |
| $R_{DS(ON)}$ (at $V_{GS}=10V$) | 1.35 | m Ω |
| $R_{DS(ON)}$ (at $V_{GS}=4.5V$) | 1.85 | m Ω |



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

| Parameter | Symbol | Rating | Units |
|--|-----------------------------|------------|---------------------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | $I_D@T_C=25^\circ\text{C}$ | 150 | A |
| Continuous Drain Current | $I_D@T_C=100^\circ\text{C}$ | 106 | A |
| Pulsed Drain Current | I_{DM} | 400 | A |
| Single Pulse Avalanche Energy ³ | EAS | 1250 | mJ |
| Total Power Dissipation | $P_D@T_C=25^\circ\text{C}$ | 135 | W |
| Derating factor | | 1.1 | W/ $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 to 150 | $^\circ\text{C}$ |
| Operating Junction Temperature Range | T_J | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|---|-----------------|-----|------|---------------------------|
| Thermal Resistance Junction-Case ¹ | $R_{\theta JC}$ | --- | 0.93 | $^\circ\text{C}/\text{W}$ |

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

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|-----------------------------------|---------------------|--|-----|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 40 | --- | --- | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =20A | --- | 1.09 | 1.35 | mΩ |
| | | V _{GS} =4.5V, I _D =20A | --- | 1.5 | 1.85 | mΩ |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 1.0 | 1.5 | 2.0 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =40V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| Forward Transconductance | g _{fs} | V _{DS} =5V, I _D =20A | --- | 80 | --- | S |
| Total Gate Charge | Q _g | V _{DS} =20V, V _{GS} =10V, I _D =20A | --- | 91 | --- | nC |
| Gate-Source Charge | Q _{gs} | | --- | 13 | --- | |
| Gate-Drain Charge | Q _{gd} | | --- | 16 | --- | |
| Turn-On Delay Time | T _{d(on)} | V _{DD} =20V, I _D =20A, V _{GS} =10V, R _G =1.6Ω | --- | 12 | --- | ns |
| Rise Time | T _r | | --- | 6.5 | --- | |
| Turn-Off Delay Time | T _{d(off)} | | --- | 49 | --- | |
| Fall Time | T _f | | --- | 8 | --- | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V, f=1MHz | --- | 5200 | --- | pF |
| Output Capacitance | C _{oss} | | --- | 1700 | --- | |
| Reverse Transfer Capacitance | C _{rss} | | --- | 85 | --- | |

Drain-Source Diode Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|-----------------|--|-----|-----|-----|------|
| Continuous Source Current ¹ | I _S | | --- | --- | 150 | A |
| Diode Forward Voltage ² | V _{SD} | V _{GS} =0V, I _S =75A, T _J =25°C | --- | --- | 1.2 | V |
| Reverse Recovery Time | t _{rr} | I _F =75A, di/dt=100A/μs, T _J =25°C | --- | --- | 30 | nS |
| Reverse Recovery Charge | Q _{rr} | | --- | --- | 110 | nC |

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25Ω

Typical Characteristics

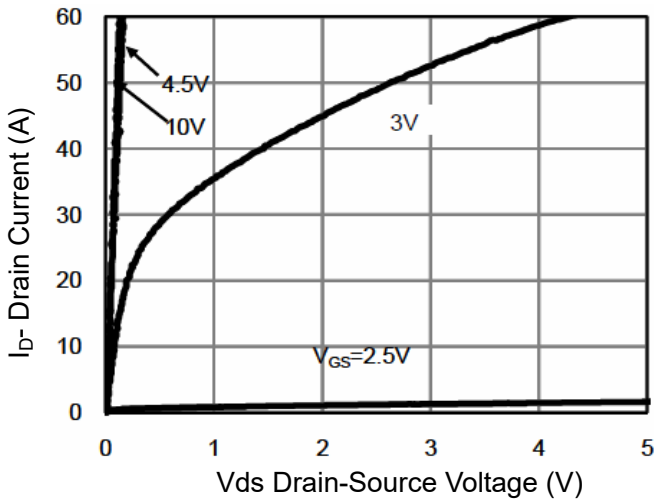


Figure 1 Output Characteristics

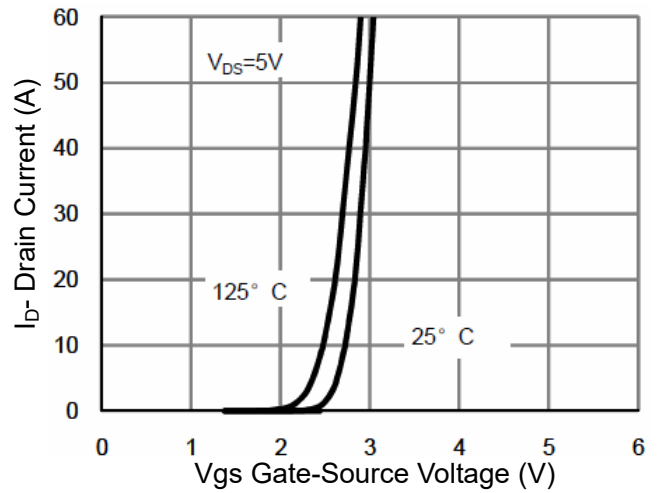


Figure 2 Transfer Characteristics

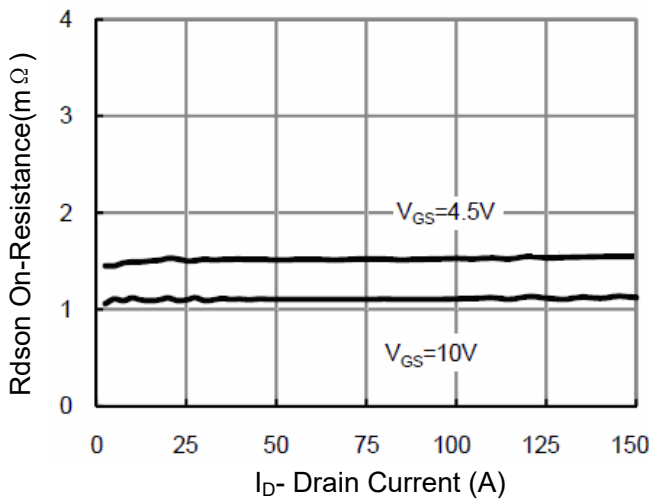


Figure 3 Rdson- Drain Current

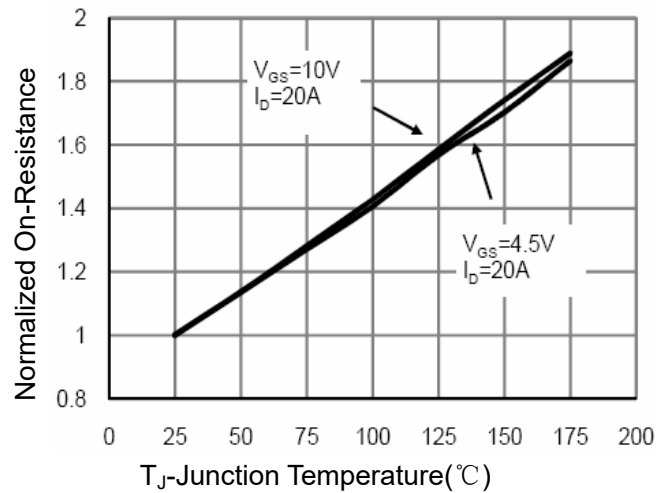


Figure 4 Rdson-Junction Temperature

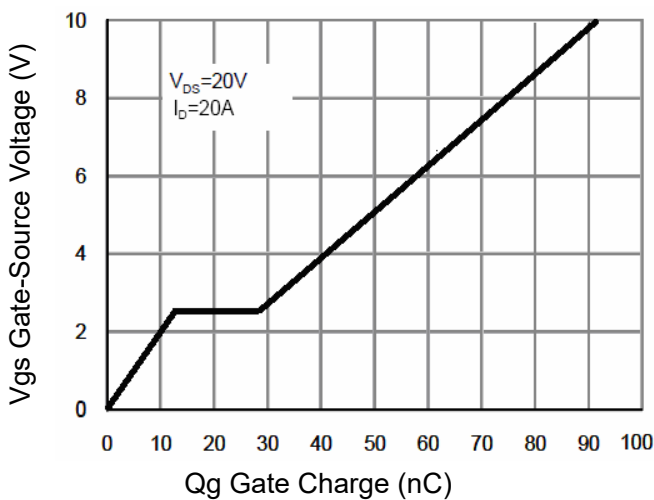


Figure 5 Gate Charge

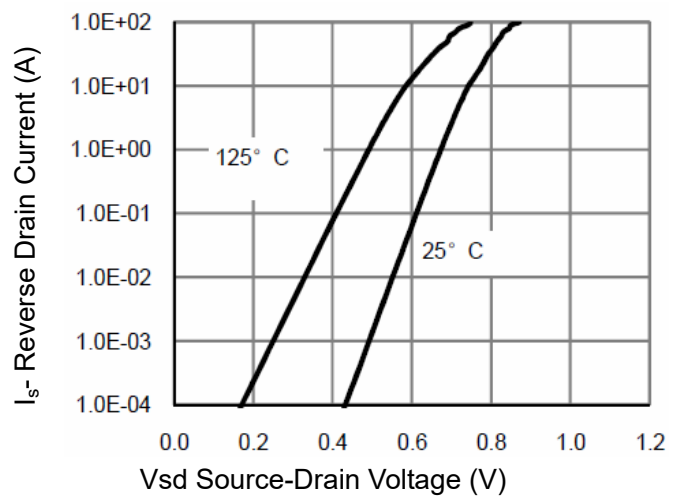


Figure 6 Source- Drain Diode Forward

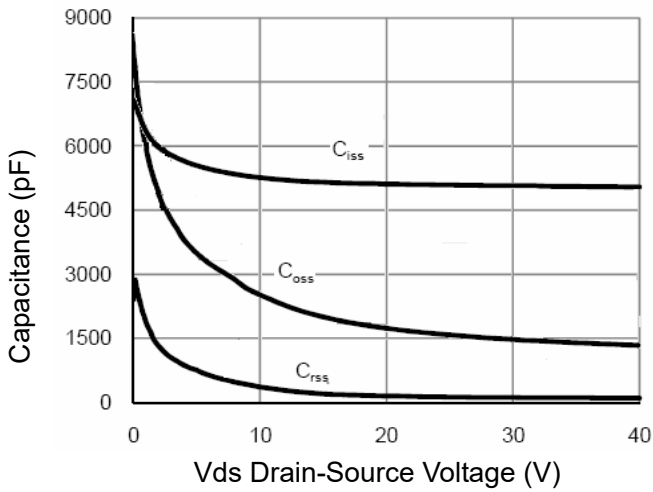


Figure 7 Capacitance vs Vds

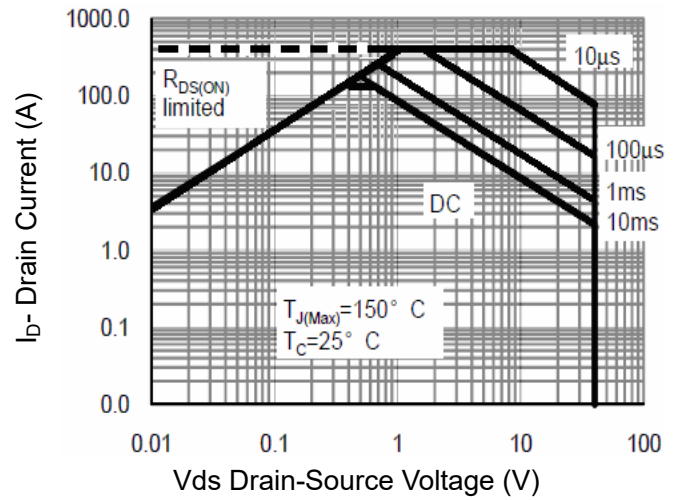


Figure 8 Safe Operation Area

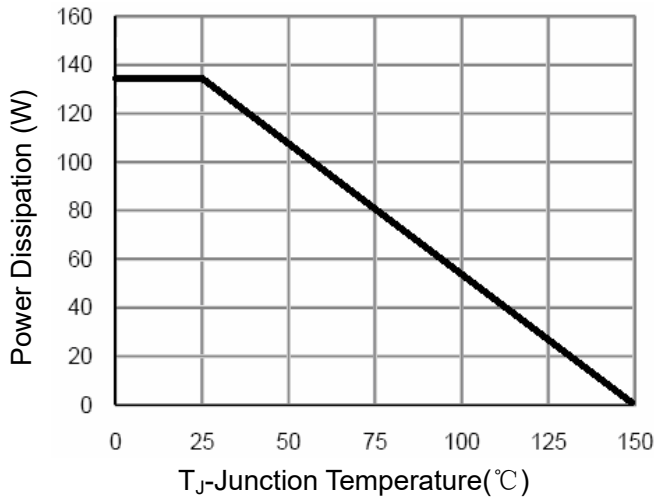


Figure 9 Power De-rating

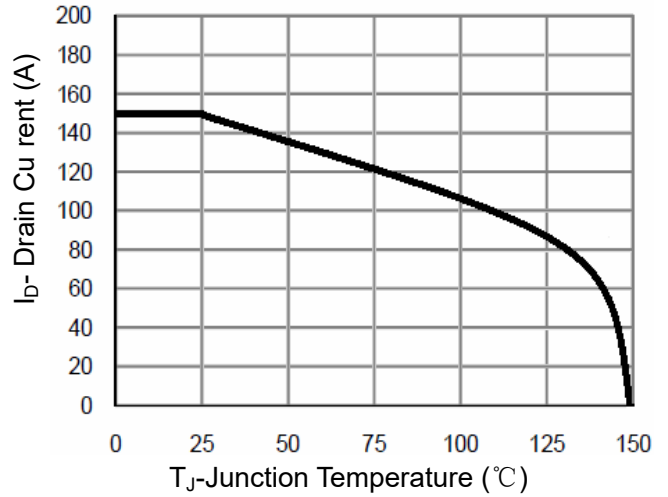


Figure 10 Current De-rating

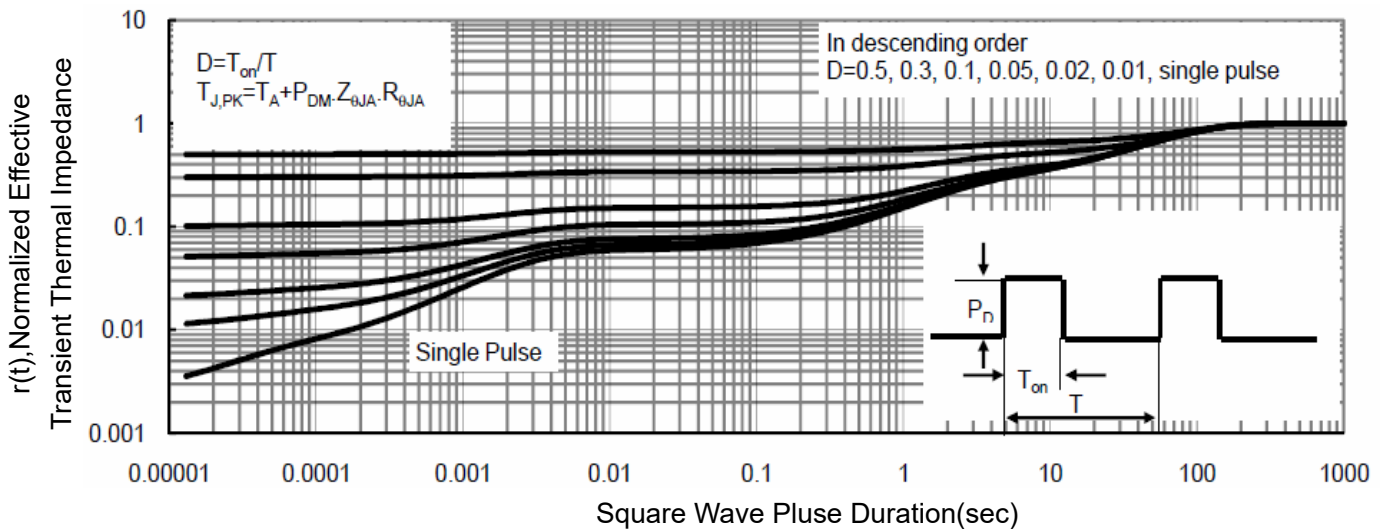
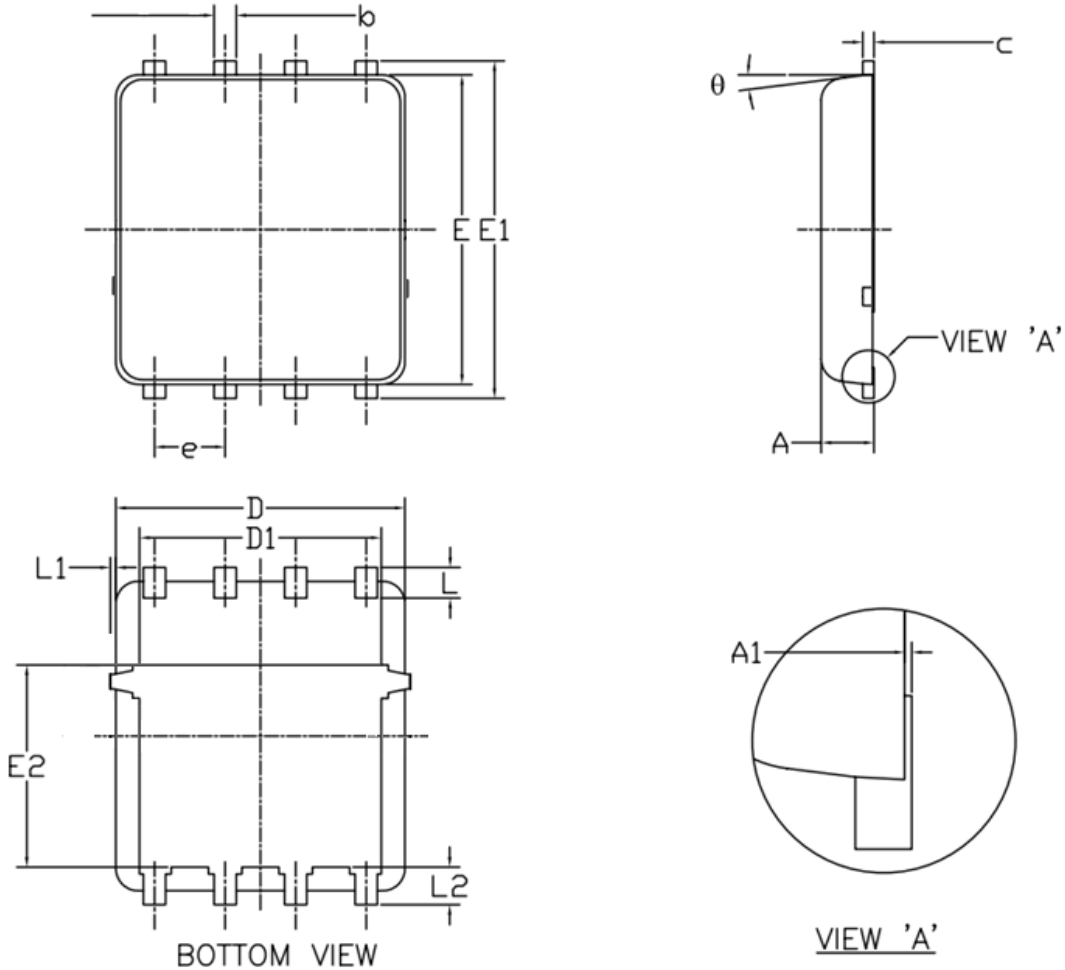


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Outline Dimensions



| Symbol | Dimensions (unit:mm) | | | Symbol | Dimensions (unit:mm) | | |
|-----------|----------------------|------|------|--------------|----------------------|------|------|
| | Min | Typ | Max | | Min | Typ | Max |
| A | 0.90 | 1.00 | 1.20 | E1 | 5.90 | 6.10 | 6.35 |
| A1 | 0.00 | -- | 0.05 | E2 | 3.38 | 3.58 | 3.92 |
| b | 0.30 | 0.40 | 0.51 | e | 1.27 BSC | | |
| c | 0.20 | 0.25 | 0.33 | L | 0.51 | 0.61 | 0.71 |
| D | 4.80 | 4.90 | 5.40 | L1 | -- | -- | 0.15 |
| D1 | 3.61 | 4.00 | 4.25 | L2 | 0.41 | 0.51 | 0.61 |
| E | 5.65 | 5.80 | 6.06 | theta | 0° | -- | 12° |