

P40B6SL

Power MOSFETs
60V, 40A, N-channel

Feature

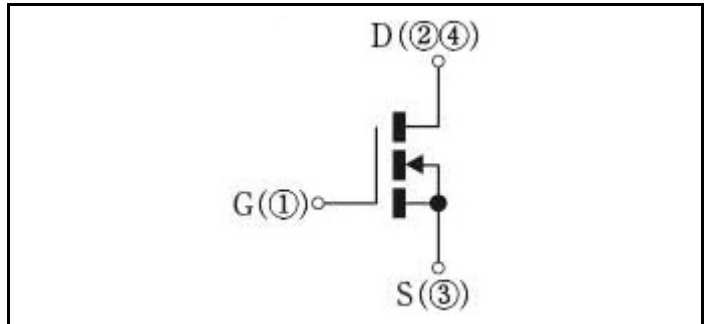
- N-channel
- SMD
- Low Ron
- 4.5V Gate Drive
- Low Capacitance
- Pb free terminal
- RoHS:Yes

OUTLINE

Package (House Name): FB
Package (JEDEC Code): TO-252AA



Equivalent circuit



Absolute Maximum Ratings (unless otherwise specified : Tc=25°C)

| Item | Symbol | Conditions | Ratings | Unit |
|--------------------------------|------------------|---|------------|------|
| Storage temperature | T _{stg} | | -55 to 150 | °C |
| Channel temperature | T _{ch} | | 150 | °C |
| Drain-source voltage | V _{DSS} | | 60 | V |
| Gate-source voltage | V _{GSS} | | ±20 | V |
| Continuous drain current(DC) | I _D | | 40 | A |
| Continuous drain current(Peak) | I _{DP} | Pulse width 10µs, duty=1/100 | 120 | A |
| Total power dissipation | P _T | | 44 | W |
| Single avalanche current | I _{AS} | Starting T _{ch} =25°C T _{ch} ≤150°C | 23 | A |
| Single avalanche energy | E _{AS} | Starting T _{ch} =25°C T _{ch} ≤150°C | 54 | mJ |

* :See the original Specifications

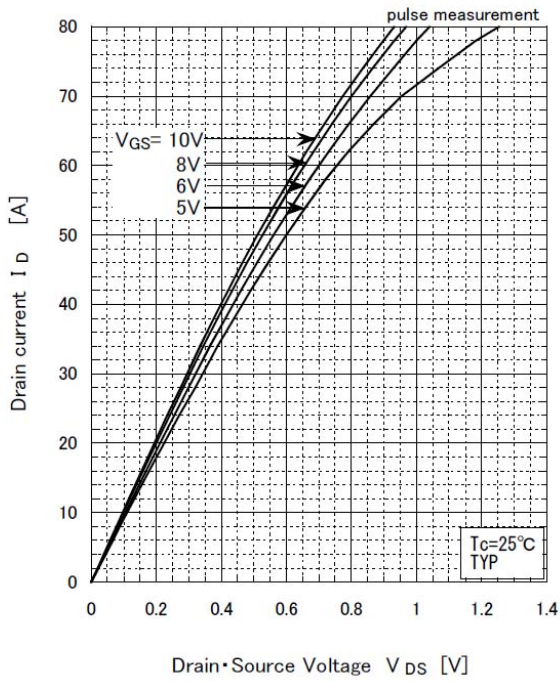
Electrical Characteristics (unless otherwise specified : Tc=25°C)

| Item | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|--|---------|--------|-------|------|
| | | | MIN | TYP | MAX | |
| Drain-Source breakdown voltage | $V_{(BR)DSS}$ | ID=1mA, VGS=0V | 60 | | | V |
| Zero gate voltage drain current | I_{DSS} | VDS=60V, VGS=0V | | | 1 | μA |
| Gate-source leakage current | I_{GSS} | VGS=±20V, VDS=0V | | | ±0.1 | μA |
| Forward transconductance | g_{fs} | ID=20A, VDS=10V | 9 | | | S |
| Static drain-source on-state resistance | $R_{DS(ON)}$ | ID=20A, VGS=10V | | 0.0095 | 0.012 | Ω |
| Static drain-source on-state resistance | $R_{DS(ON)}$ | ID=20A, VGS=4.5V | | 0.012 | 0.016 | Ω |
| Gate threshold voltage | V_{th} | ID=1mA, VDS=10V | 1.5 | 2 | 2.5 | V |
| Source-drain diode forward voltage | V_{SD} | IS=40A, VGS=0V | | | 1.5 | V |
| Thermal resistance | $R_{th(j-c)}$ | Junction to case | | | 2.84 | °C/W |
| Total gate charge | Q_g | VDD=48V, VGS=10V, ID=40A | | 43 | | nC |
| Gate to source charge | Q_{gs} | VDD=48V, VGS=10V, ID=40A | | 8.5 | | nC |
| Gate to drain charge | Q_{gd} | VDD=48V, VGS=10V, ID=40A | | 10 | | nC |
| Input capacitance | C_{iss} | VDS=25V, VGS=0V, f=1MHz | | 2050 | | pF |
| Reverse transfer capacitance | C_{rss} | VDS=25V, VGS=0V, f=1MHz | | 110 | | pF |
| Output capacitance | C_{oss} | VDS=25V, VGS=0V, f=1MHz | | 216 | | pF |
| Turn-on delay time | $t_{d(on)}$ | ID=20A, RL=1.5Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V | | 6 | | ns |
| Rise time | t_r | ID=20A, RL=1.5Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V | | 18 | | ns |
| Turn-off delay time | $t_{d(off)}$ | ID=20A, RL=1.5Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V | | 29 | | ns |
| Fall time | t_f | ID=20A, RL=1.5Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V | | 17 | | ns |
| Diode reverse recovery time | t_{rr} | IF=40A, VGS=0V, di/dt=100A/μs | | 42 | | ns |
| Diode reverse recovery charge | Q_{rr} | IF=40A, VGS=0V, di/dt=100A/μs | | 51 | | nC |

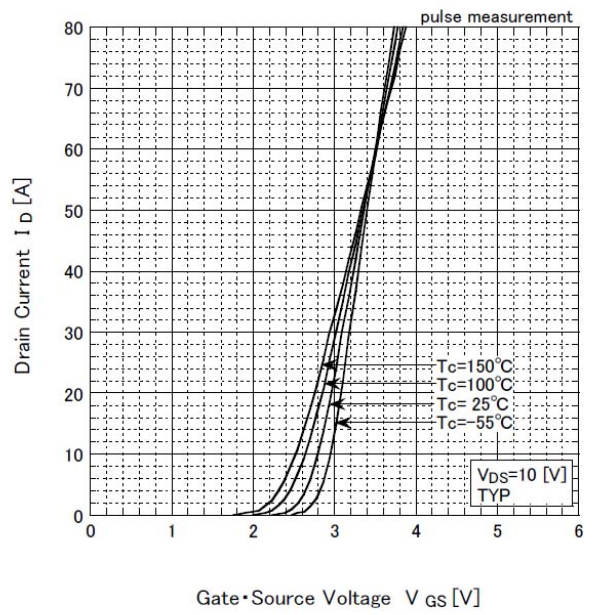
* : See the original Specifications

CHARACTERISTIC DIAGRAMS

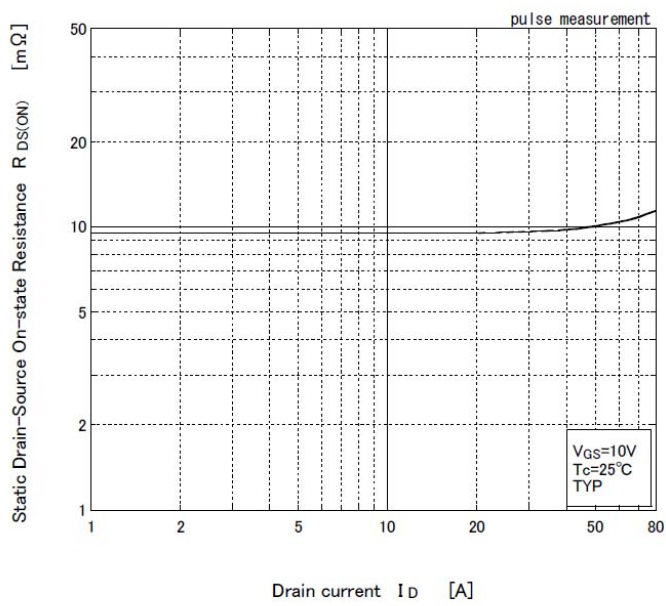
Typical Output Characteristics



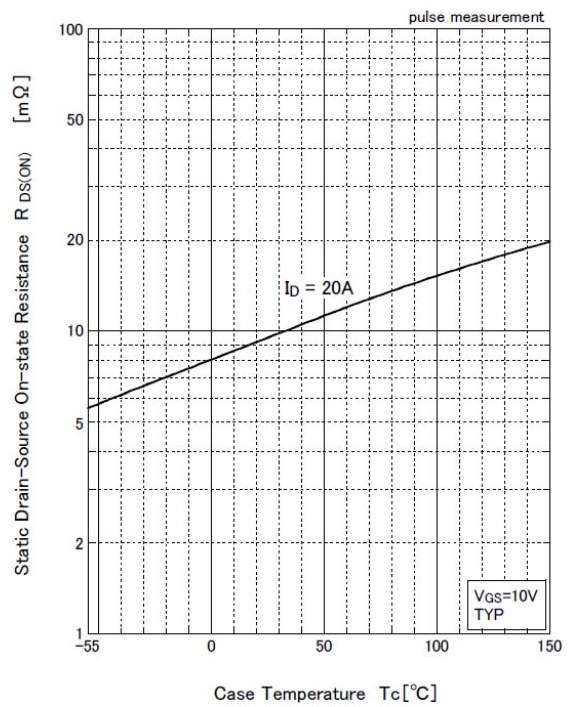
Transfer Characteristics

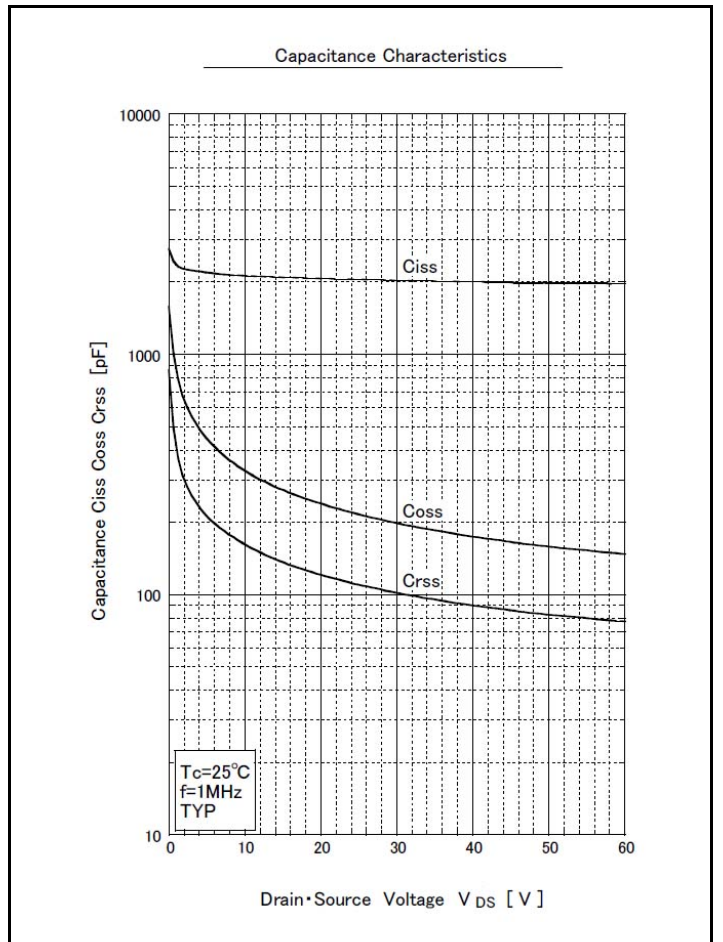
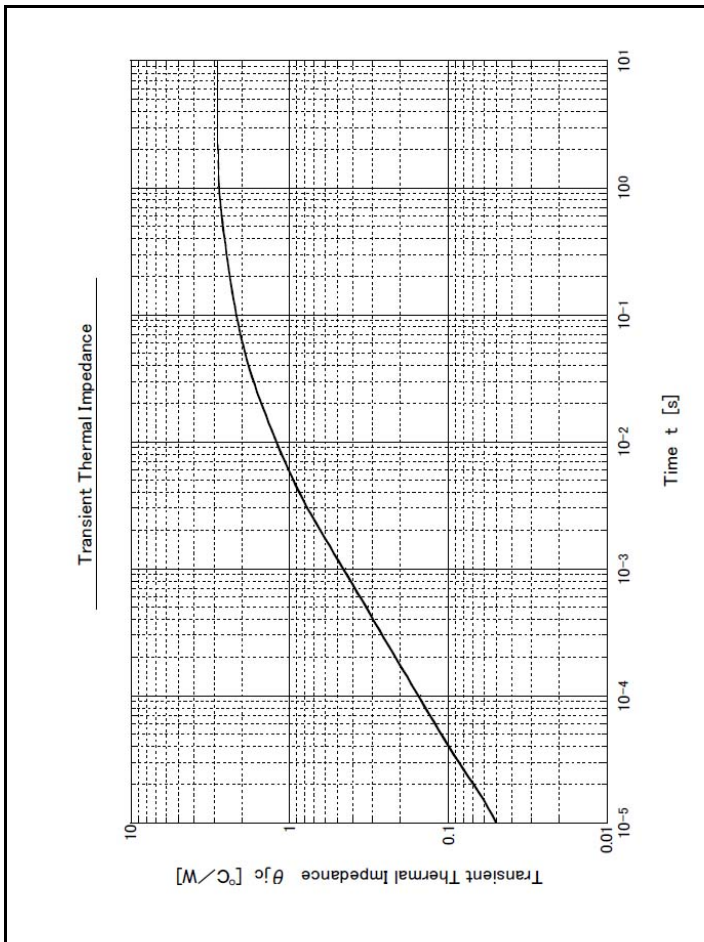
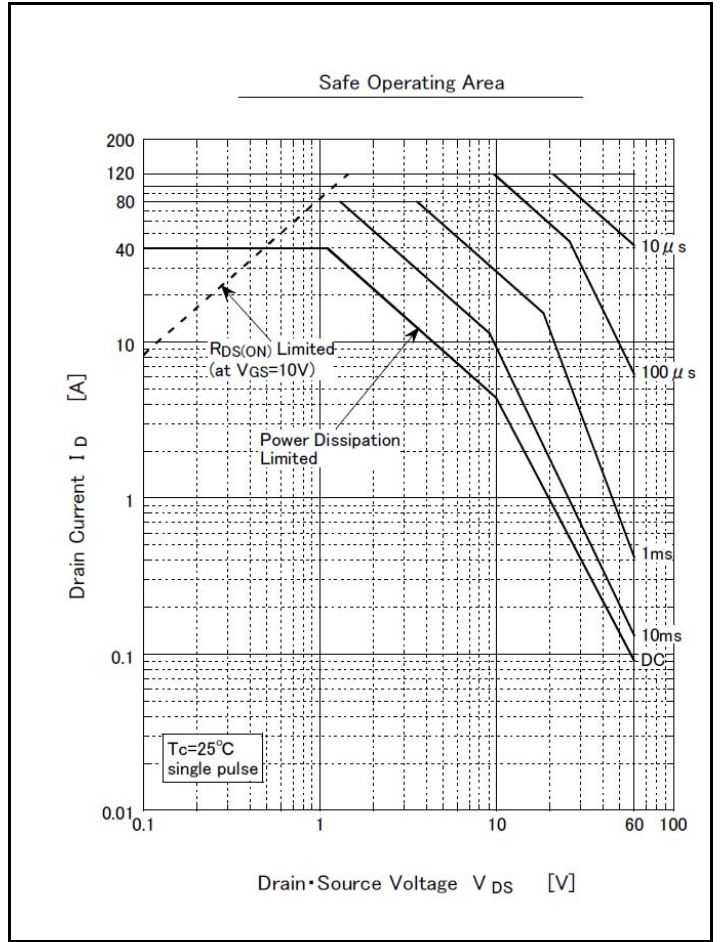
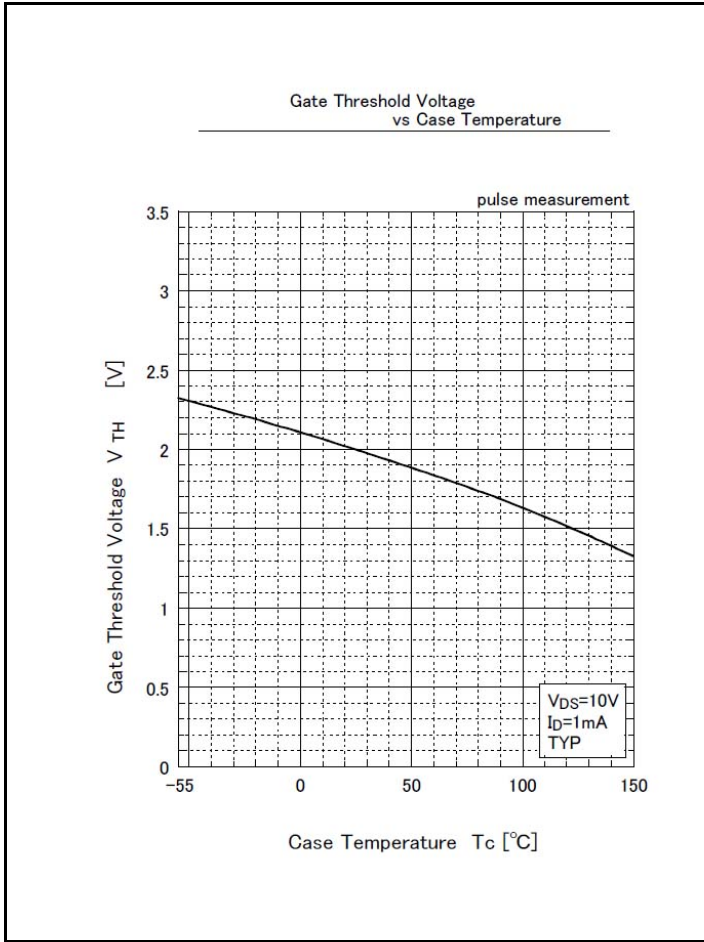


Static Drain-Source On-state Resistance vs Drain Current

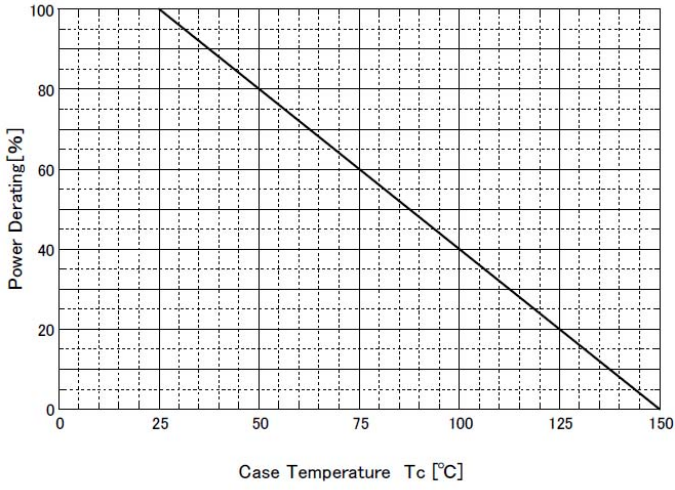


Static Drain-Source On-state Resistance vs Case Temperature

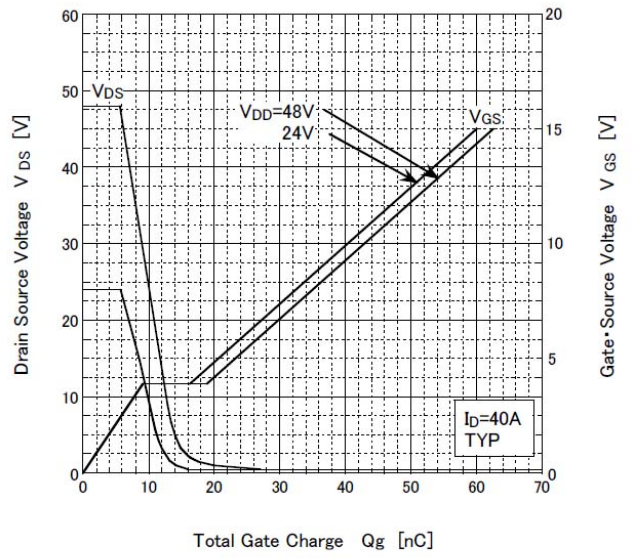




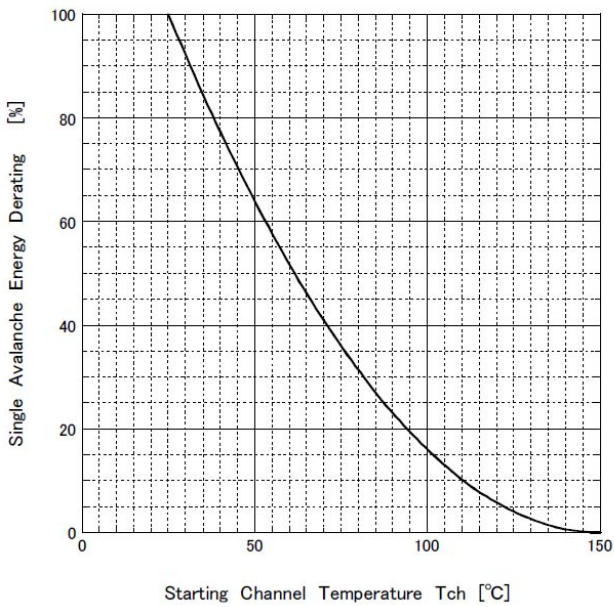
Power Derating - Case Temperature



Gate Charge Characteristics

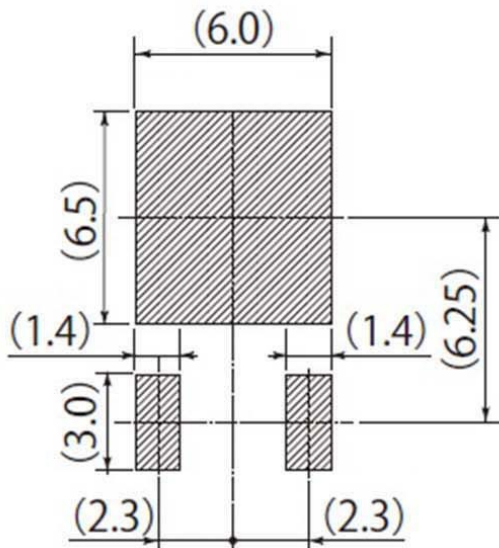
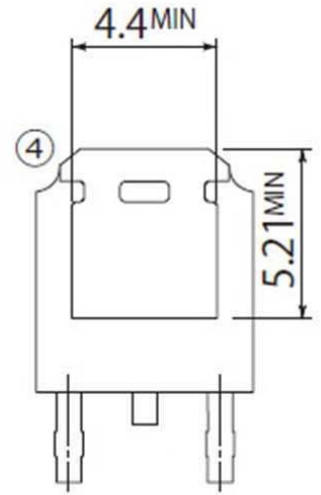
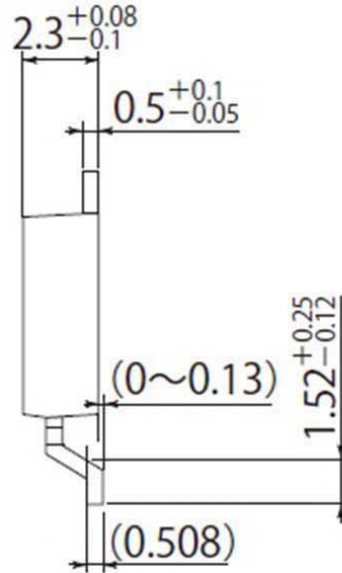
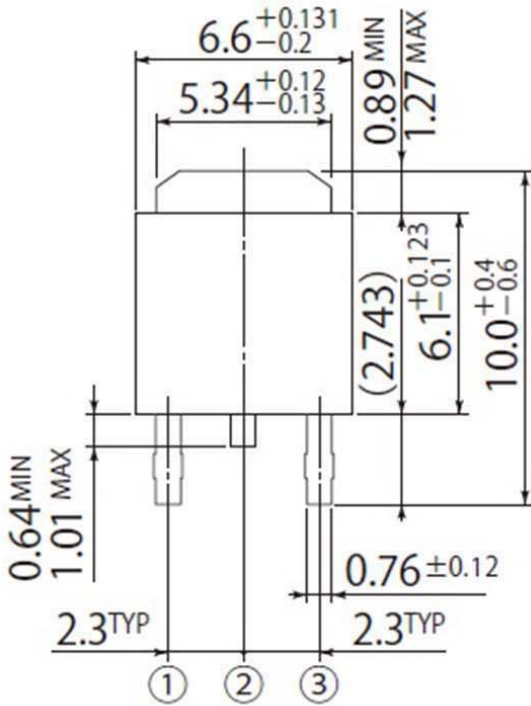


Single Avalanche Energy Derating vs Channel Temperature



G2

| | |
|------------|----------|
| JEDEC Code | TO-252AA |
| JEITA Code | - |
| House Name | FB |



Referential Soldering Pad

• Optimize soldering pad to the board design and soldering condition.

Notes

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