

# P20B12SL

Power MOSFETs  
120V, 20A, N-channel

### Feature

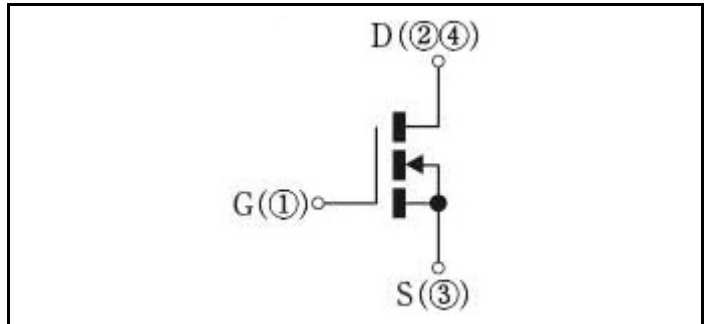
- N-channel
- SMD
- Low Ron
- 4.5V Gate Drive
- Low Capacitance
- Pb free terminal
- RoHS:Yes

### 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 <sub>stg</sub>		-55 to 150	°C
Channel temperature	T <sub>ch</sub>		150	°C
Drain-source voltage	V <sub>DSS</sub>		120	V
Gate-source voltage	V <sub>GSS</sub>		±20	V
Continuous drain current(DC)	I <sub>D</sub>		20	A
Continuous drain current(Peak)	I <sub>DP</sub>	Pulse width 10µs, duty=1/100	60	A
Total power dissipation	P <sub>T</sub>		44	W
Single avalanche current	I <sub>AS</sub>	Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C	18	A
Single avalanche energy	E <sub>AS</sub>	Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C	37	mJ

\* :See the original Specifications

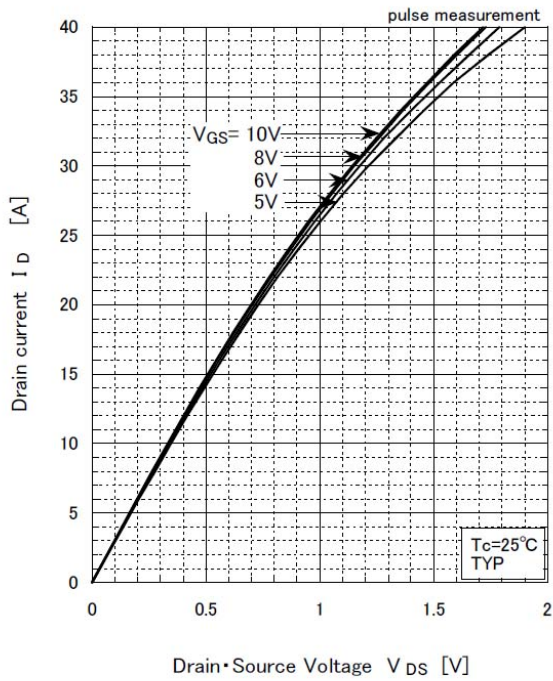
**Electrical Characteristics** (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	120			V
Zero gate voltage drain current	$I_{DSS}$	VDS=120V, VGS=0V			1	μA
Gate-source leakage current	$I_{GSS}$	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	$g_{fs}$	ID=10A, VDS=10V	8			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=10A, VGS=10V		0.035	0.044	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=10A, VGS=4.5V		0.037	0.05	Ω
Gate threshold voltage	$V_{th}$	ID=1mA, VDS=10V	1.5	2	2.5	V
Source-drain diode forward voltage	$V_{SD}$	IS=20A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case			2.84	°C/W
Total gate charge	$Q_g$	VDD=96V, VGS=10V, ID=20A		46		nC
Gate to source charge	$Q_{gs}$	VDD=96V, VGS=10V, ID=20A		8		nC
Gate to drain charge	$Q_{gd}$	VDD=96V, VGS=10V, ID=20A		12		nC
Input capacitance	$C_{iss}$	VDS=25V, VGS=0V, f=1MHz		2110		pF
Reverse transfer capacitance	$C_{rss}$	VDS=25V, VGS=0V, f=1MHz		73		pF
Output capacitance	$C_{oss}$	VDS=25V, VGS=0V, f=1MHz		140		pF
Turn-on delay time	$t_{d(on)}$	ID=10A, RL=6Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		6		ns
Rise time	$t_r$	ID=10A, RL=6Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		9		ns
Turn-off delay time	$t_{d(off)}$	ID=10A, RL=6Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		32		ns
Fall time	$t_f$	ID=10A, RL=6Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		18		ns
Diode reverse recovery time	$t_{rr}$	IF=20A, VGS=0V, di/dt=100A/μs		57		ns
Diode reverse recovery charge	$Q_{rr}$	IF=20A, VGS=0V, di/dt=100A/μs		120		nC

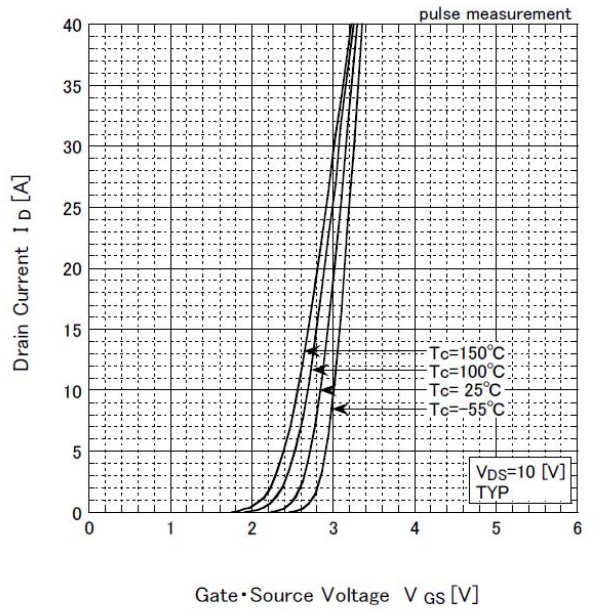
\* : See the original Specifications

# CHARACTERISTIC DIAGRAMS

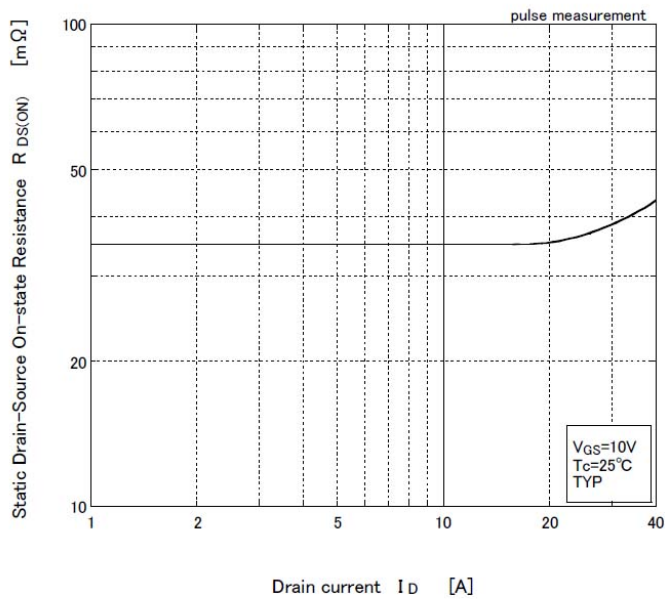
Typical Output Characteristics



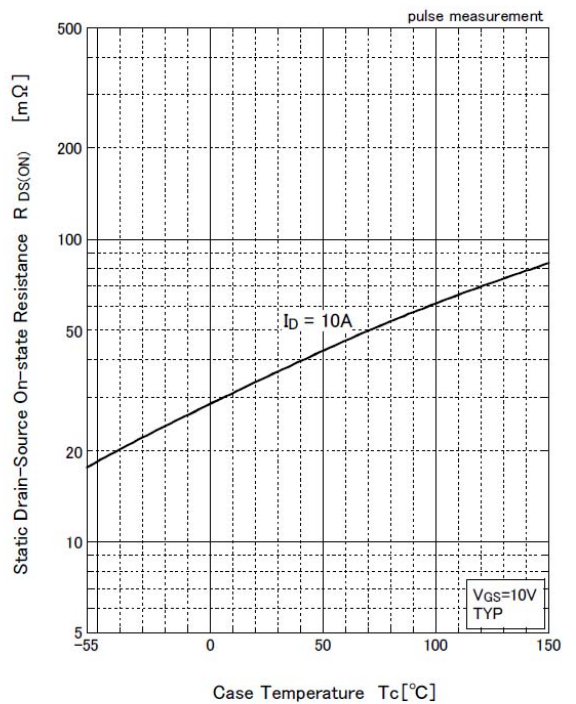
Transfer Characteristics

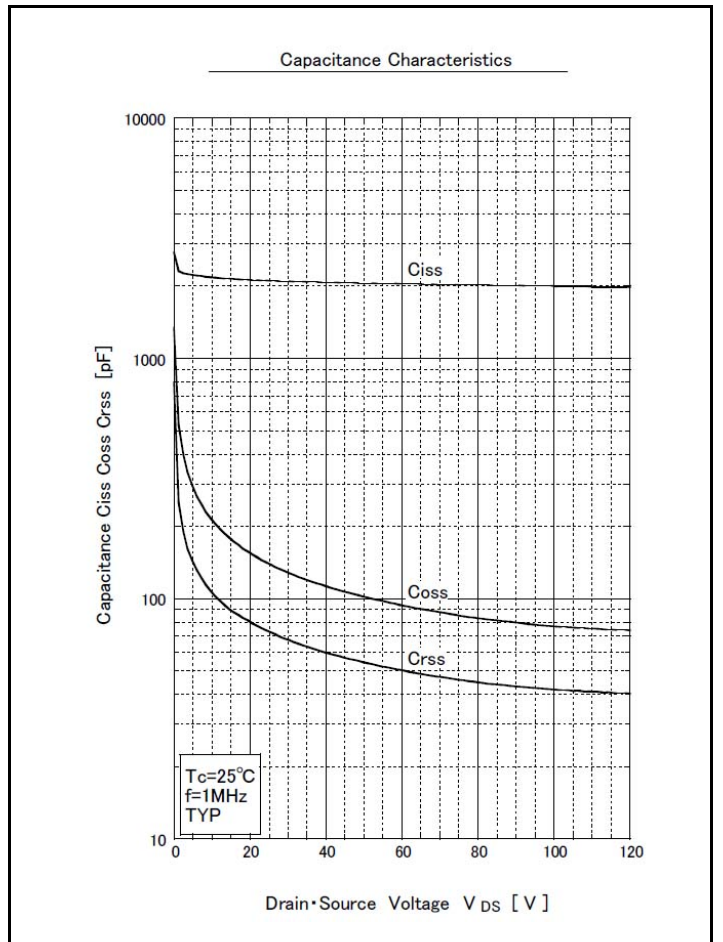
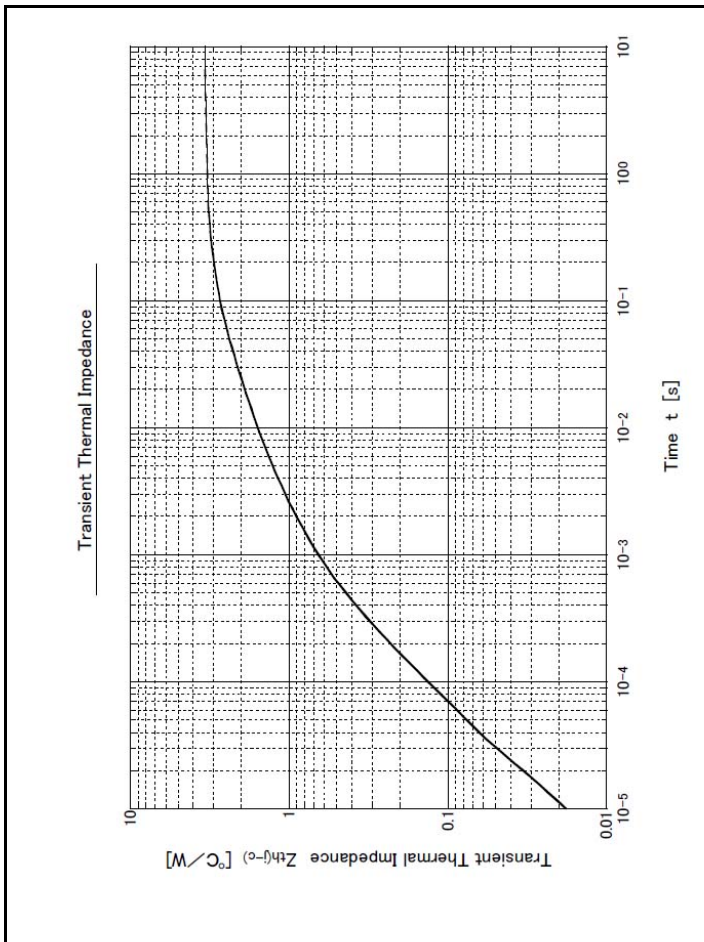
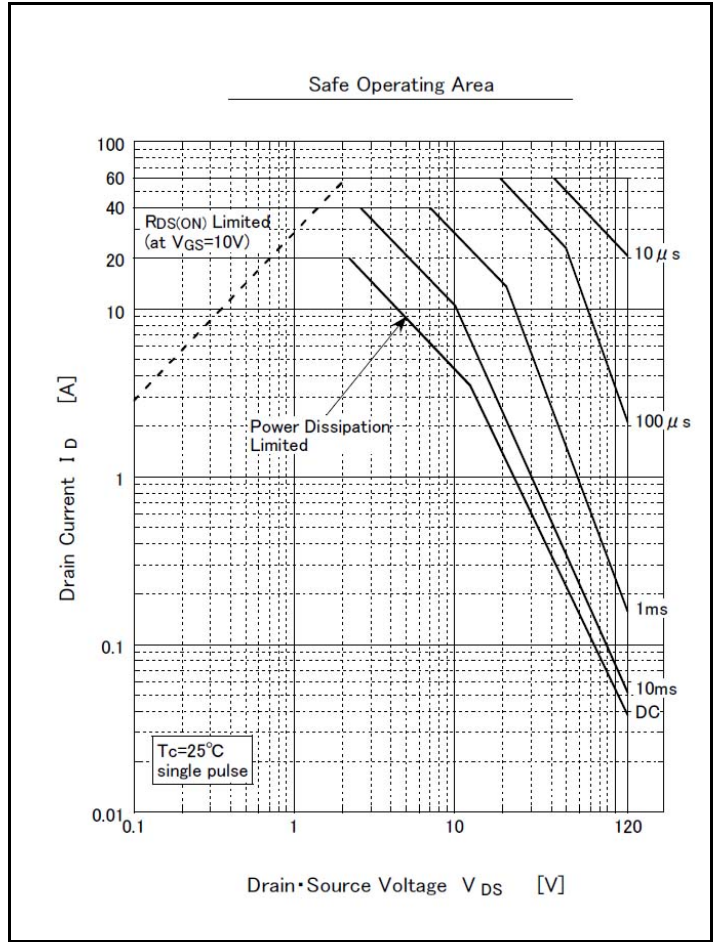
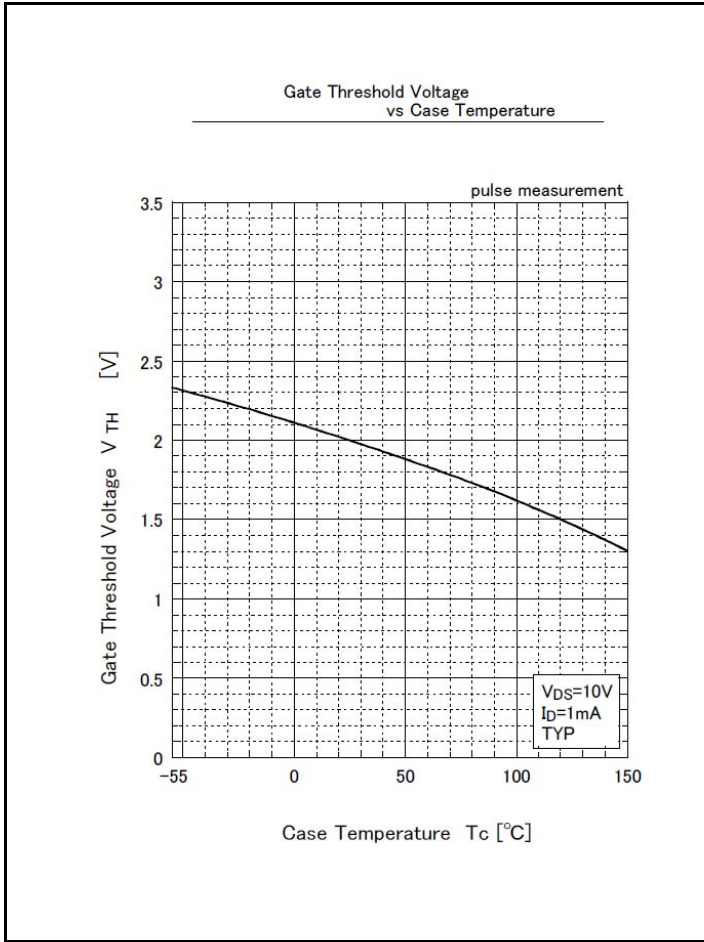


Static Drain-Source On-state Resistance vs Drain Current

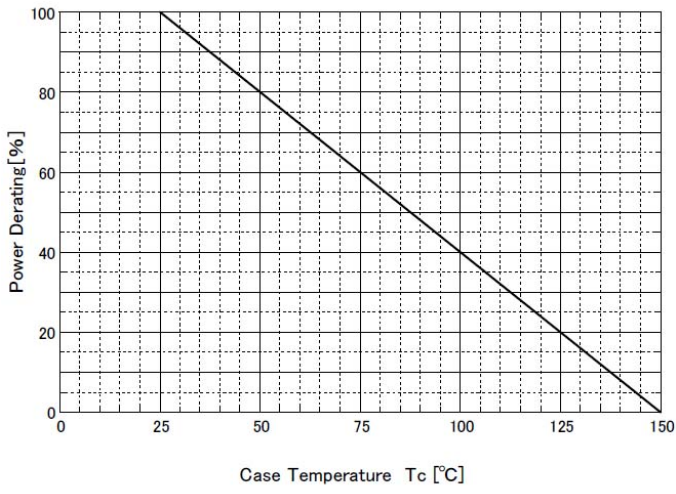


Static Drain-Source On-state Resistance vs Case Temperature

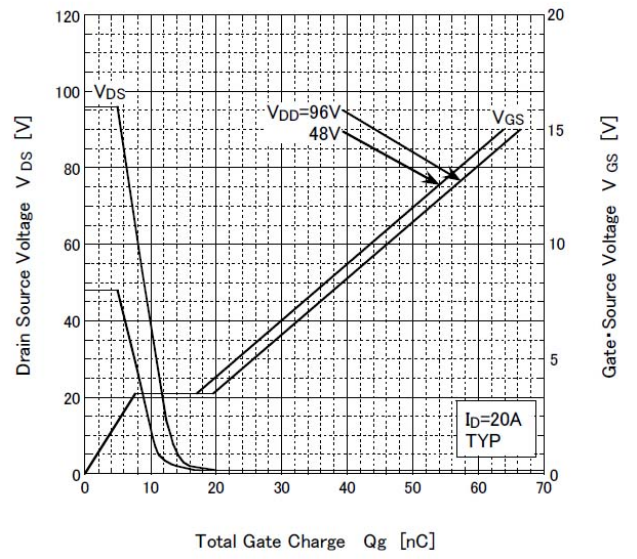




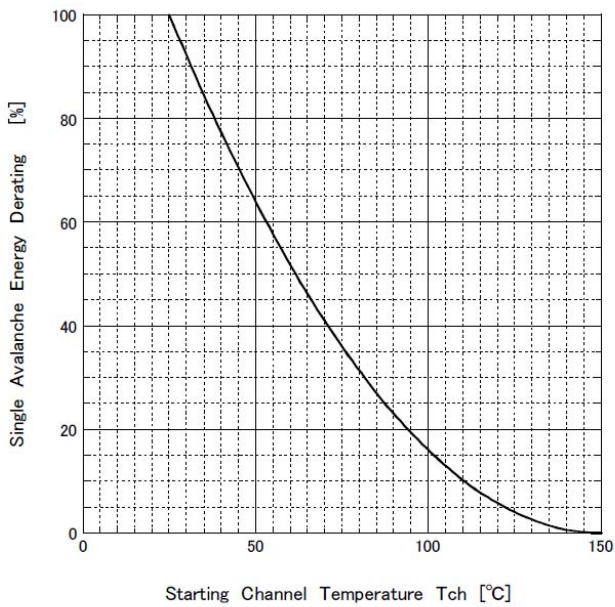
Power Derating – Case Temperature



Gate Charge Characteristics

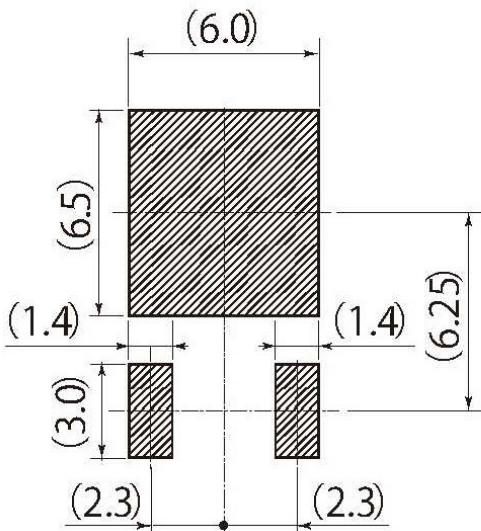
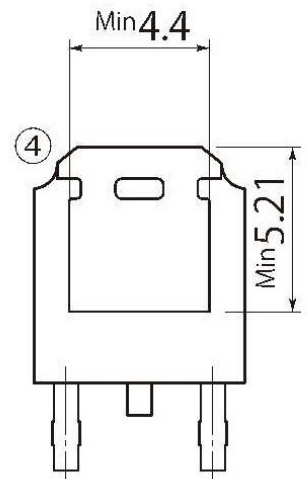
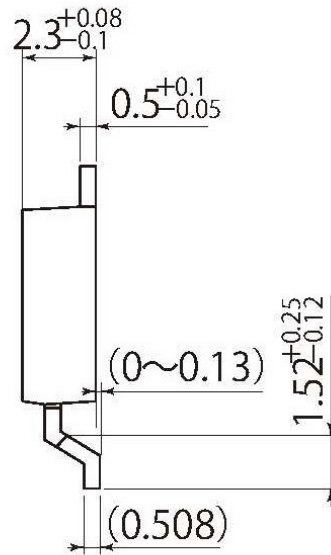
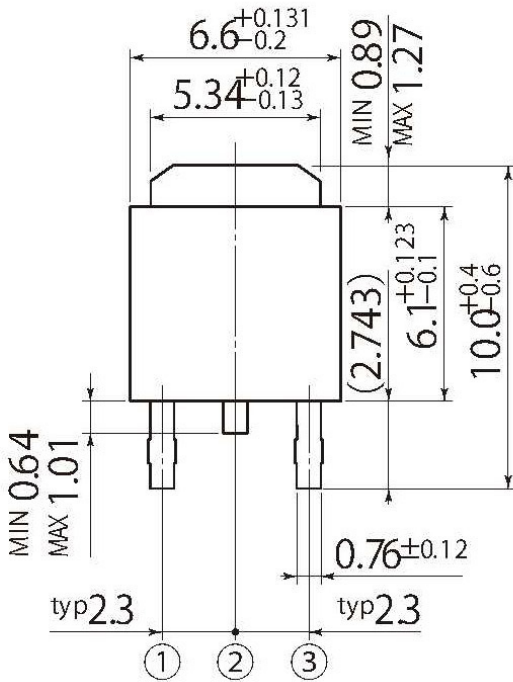


Single Avalanche Energy Derating vs Channel Temperature



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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