

## P2B90VX3K

### Power MOSFETs

900V, 2A, N-channel

#### Feature

- N-channel
- SMD
- High Voltage (900V)
- Low Capacitance
- High Avalanche Durability, High di/dt Durability
- Based on AEC-Q101
- Halogen free
- Pb free terminal
- RoHS:Yes

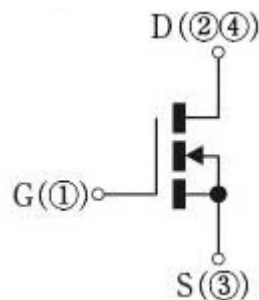
#### OUTLINE

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>		-55 to 150	°C
Drain-source voltage	V <sub>DSS</sub>		900	V
Gate-source voltage	V <sub>GSS</sub>		±30	V
Continuous drain current(DC)	I <sub>D</sub>		2	A
Continuous drain current(Peak)	I <sub>DP</sub>	Pulse width 10μs, duty=1/100	8	A
Continuous source current(DC)	I <sub>S</sub>		2	A
Total power dissipation	P <sub>T</sub>	With heatsink ※	44	W
Total power dissipation	P <sub>T</sub>	Measured on the 1 inch <sup>2</sup> glass epoxy substrate pattern area : 586.81mm <sup>2</sup>	2.7	W
Total power dissipation	P <sub>T</sub>	Measured on the 1 inch <sup>2</sup> glass epoxy substrate pattern area : 102.19mm <sup>2</sup>	1.6	W
Repetitive avalanche current	I <sub>AR</sub>	Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C	2	A
Single avalanche energy	E <sub>AS</sub>	Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C	30	mJ
Repetitive avalanche energy	E <sub>AR</sub>	Starting T <sub>ch</sub> =25°C T <sub>ch</sub> ≤150°C	3	mJ
Drain-source diode di/dt strength	di/dt	I <sub>s</sub> =2A, T <sub>c</sub> =25°C	350	A/μs

※ : See the original Specifications

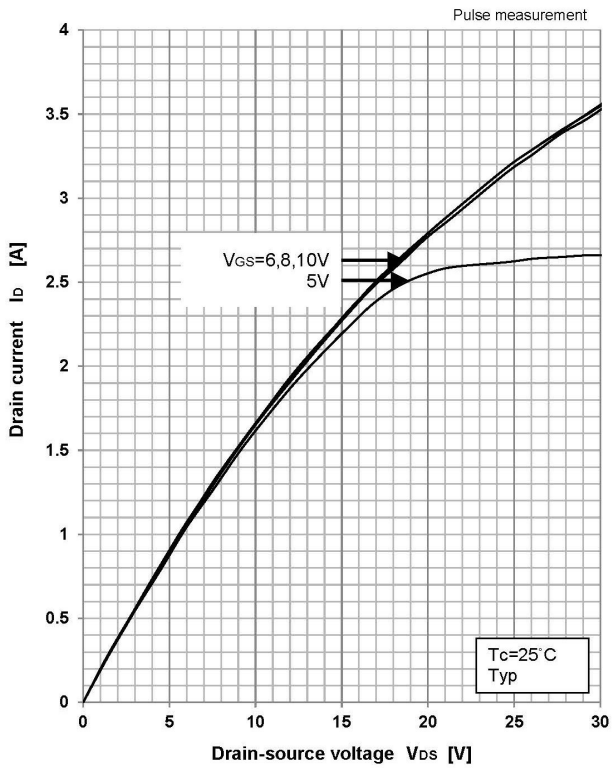
**Electrical Characteristics** (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	900			V
Zero gate voltage drain current	$I_{DSS}$	VDS=900V, VGS=0V			100	μA
Gate-source leakage current	$I_{GSS}$	VGS=±25V, VDS=0V			±10	μA
Forward transconductance	$g_{fs}$	ID=1A, VDS=10V	1.8	4.1		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=1A, VGS=10V		5.6	7.2	Ω
Gate threshold voltage	$V_{th}$	ID=1mA, VDS=10V	3	3.5	4	V
Source-drain diode forward voltage	$V_{SD}$	IS=1A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case, with heatsink			2.8	°C/W
Thermal resistance	$R_{th(j-a)}$	Junction to ambient Measured on the 1 inch <sup>2</sup> glass epoxy substrate pattern area : 586.81mm <sup>2</sup>			45	°C/W
Thermal resistance	$R_{th(j-a)}$	Junction to ambient Measured on the 1 inch <sup>2</sup> glass epoxy substrate pattern area : 102.19mm <sup>2</sup>			75	°C/W
Total gate charge	$Q_g$	VDD=400V, VGS=10V, ID=2A		15		nC
Input capacitance	$C_{iss}$	VDS=25V, VGS=0V, f=1MHz		370		pF
Reverse transfer capacitance	$C_{rss}$	VDS=25V, VGS=0V, f=1MHz		5.9		pF
Output capacitance	$C_{oss}$	VDS=25V, VGS=0V, f=1MHz		42		pF
Turn-on delay time	$t_{d(on)}$	ID=1A, RL=300Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		14.5		ns
Rise time	$t_r$	ID=1A, RL=300Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		26		ns
Turn-off delay time	$t_{d(off)}$	ID=1A, RL=300Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		67		ns
Fall time	$t_f$	ID=1A, RL=300Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		28		ns

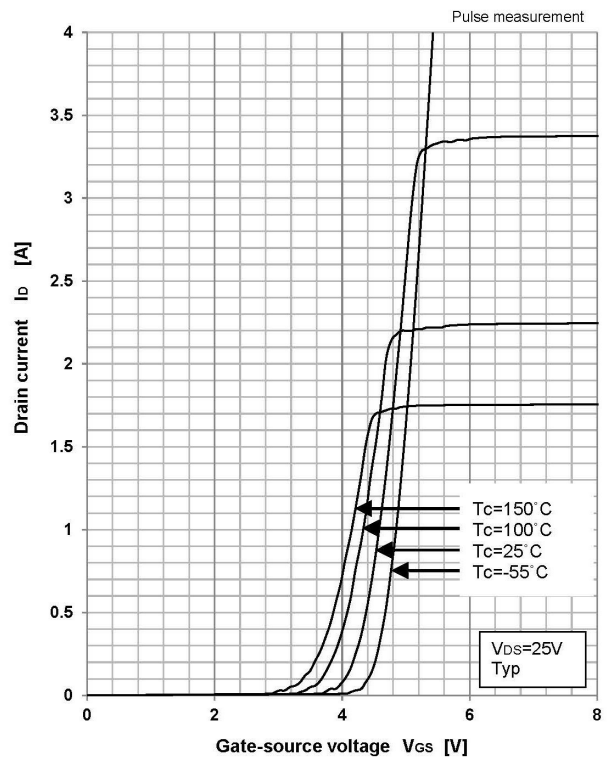
\* : See the original Specifications

# CHARACTERISTIC DIAGRAMS

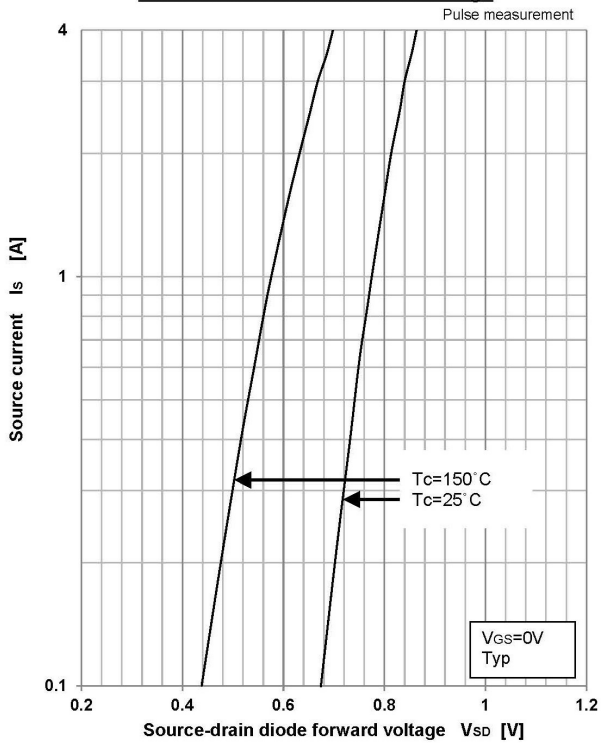
**Typical output characteristics**



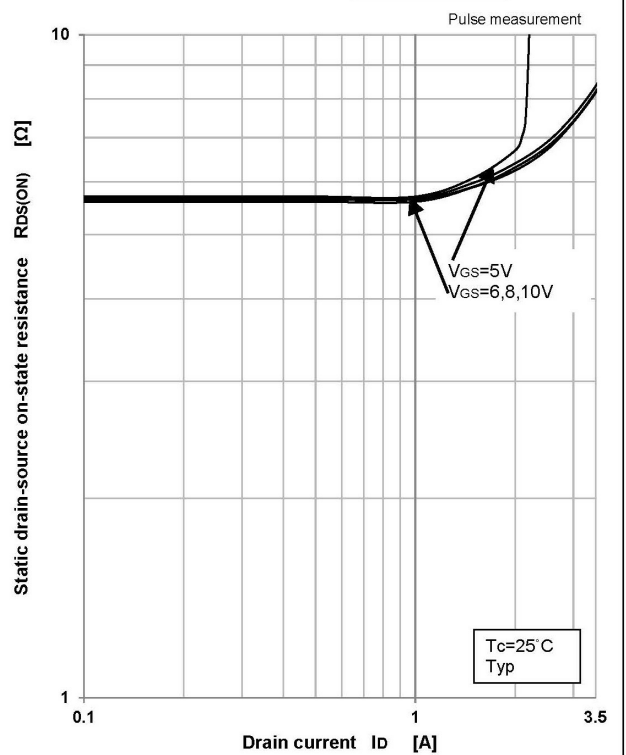
**Transfer characteristics**

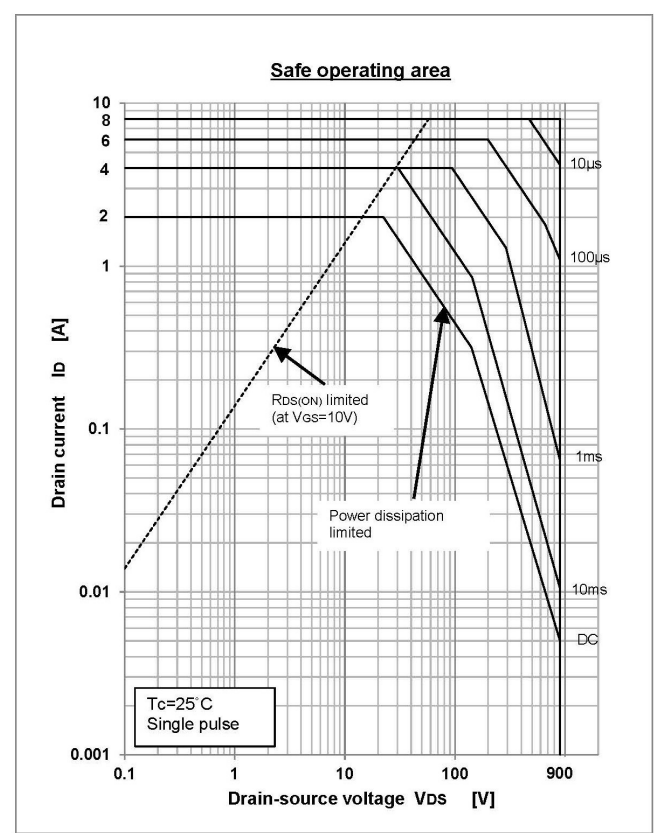
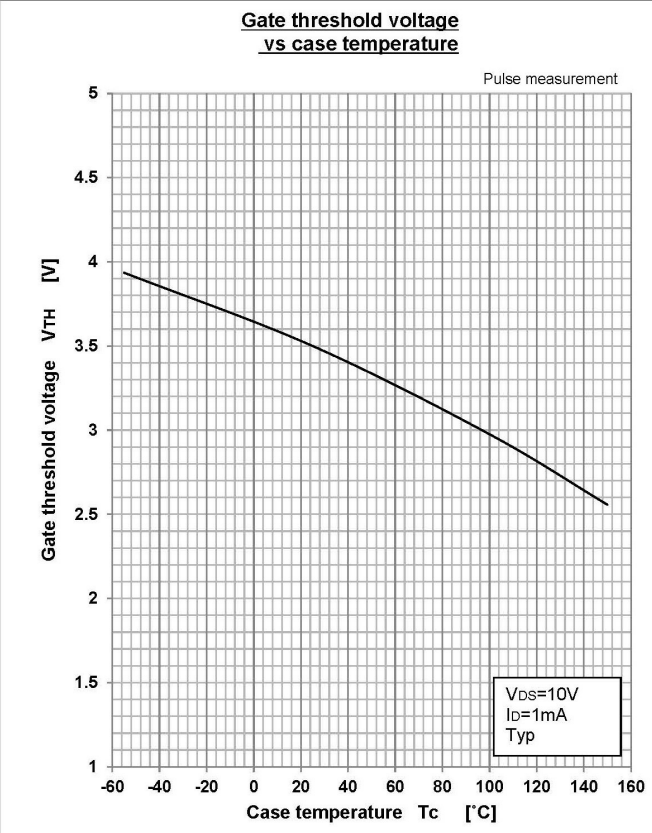
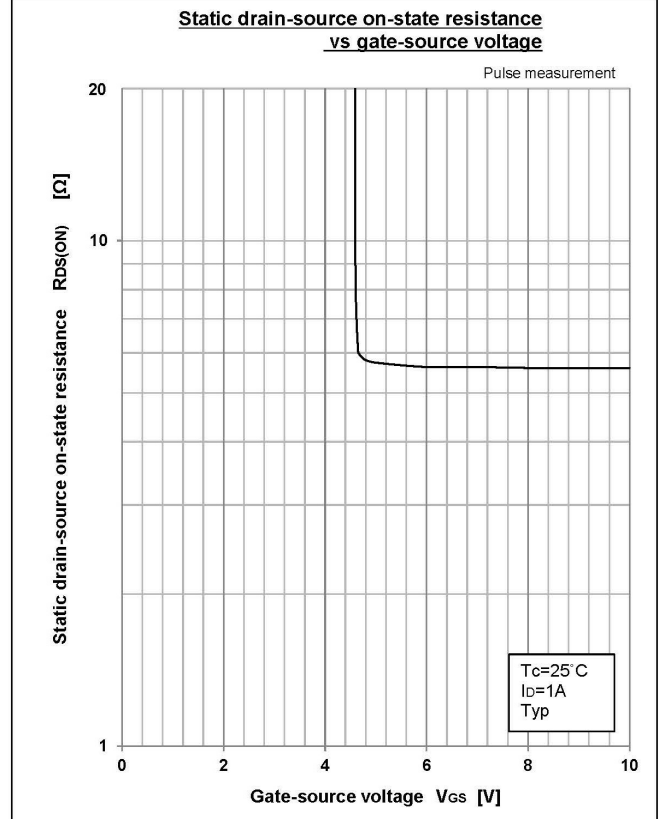
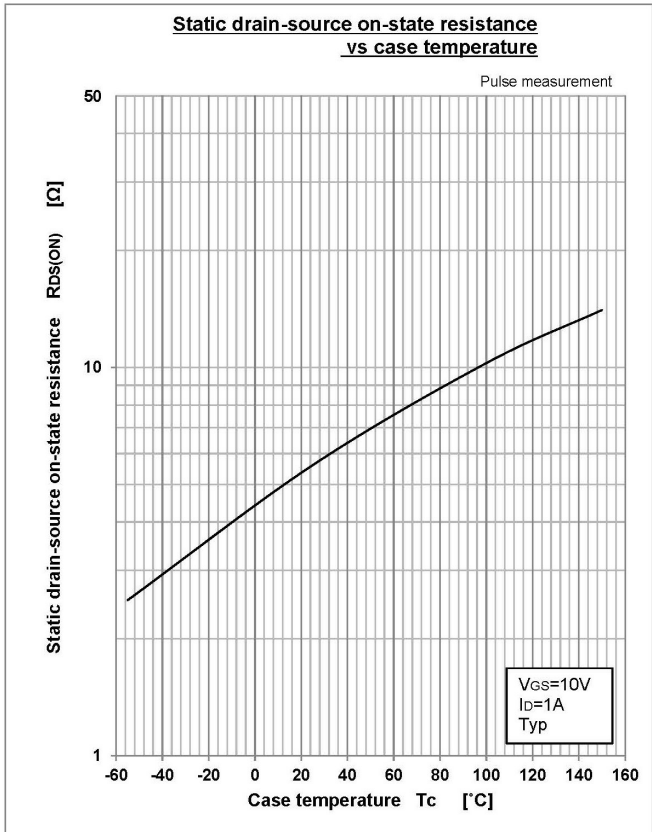


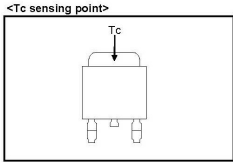
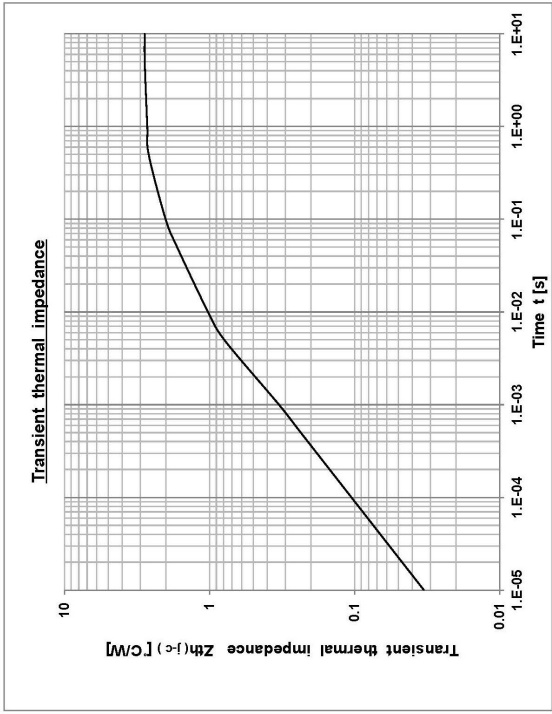
**Source current vs source-drain diode forward voltage**



**Static drain-source on-state resistance vs drain current**



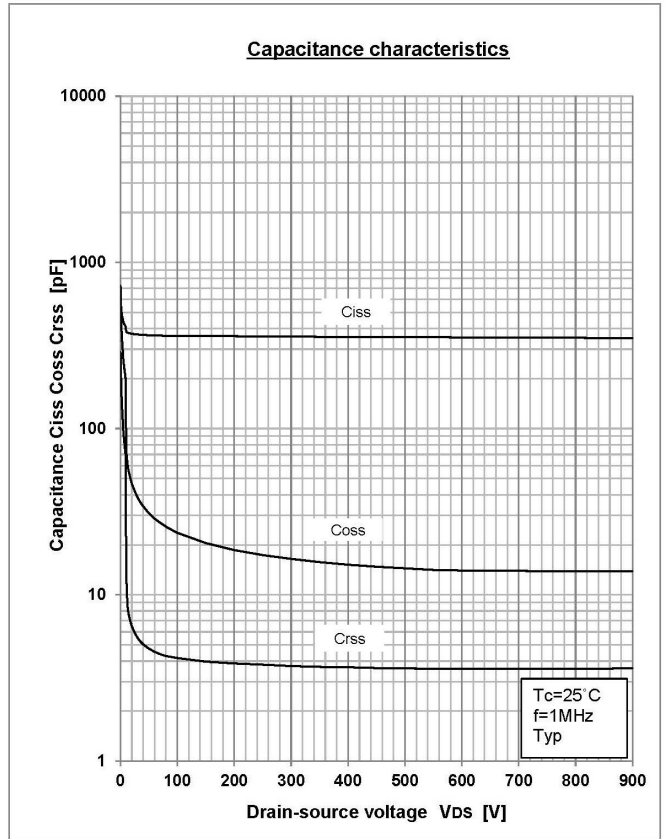
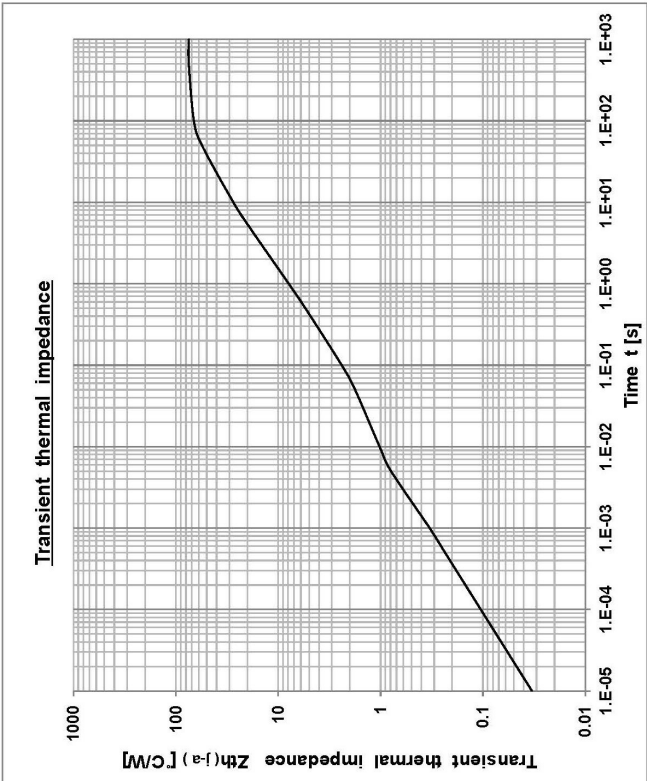
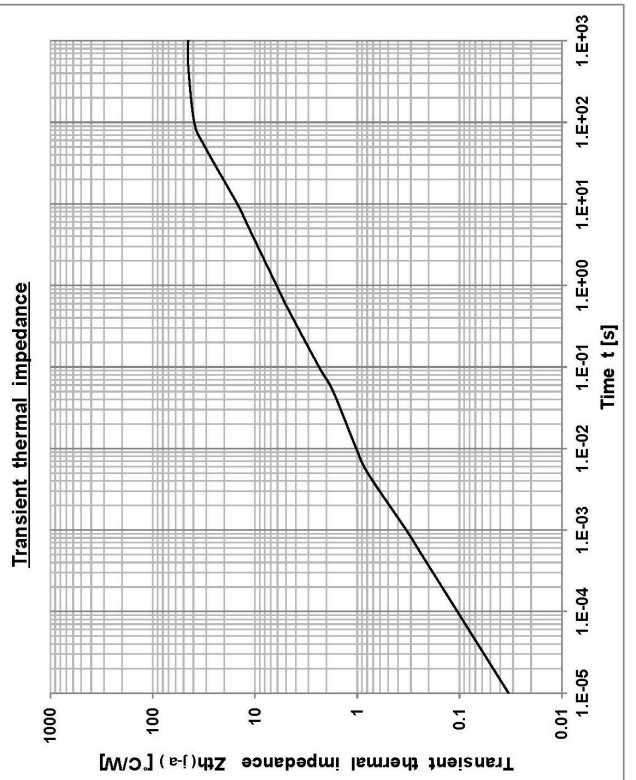


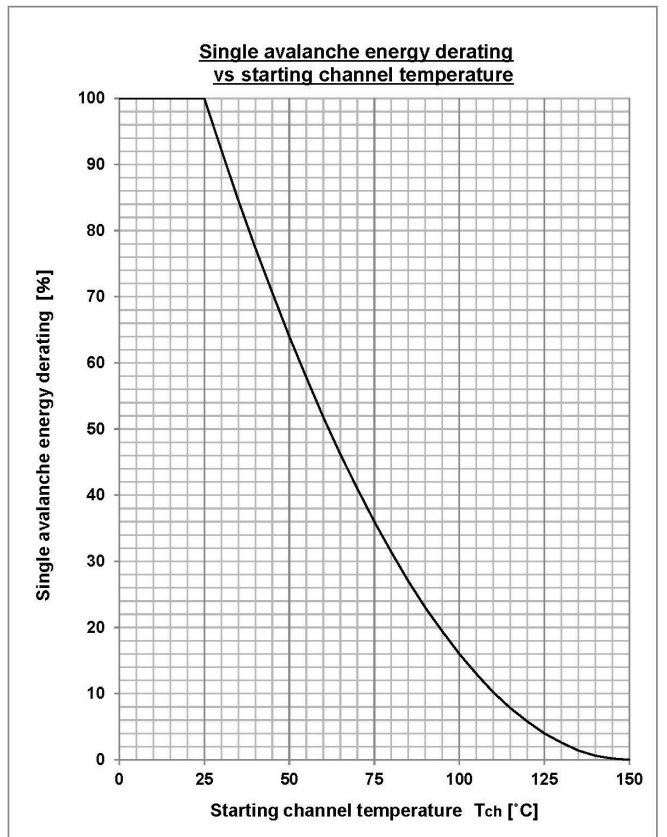
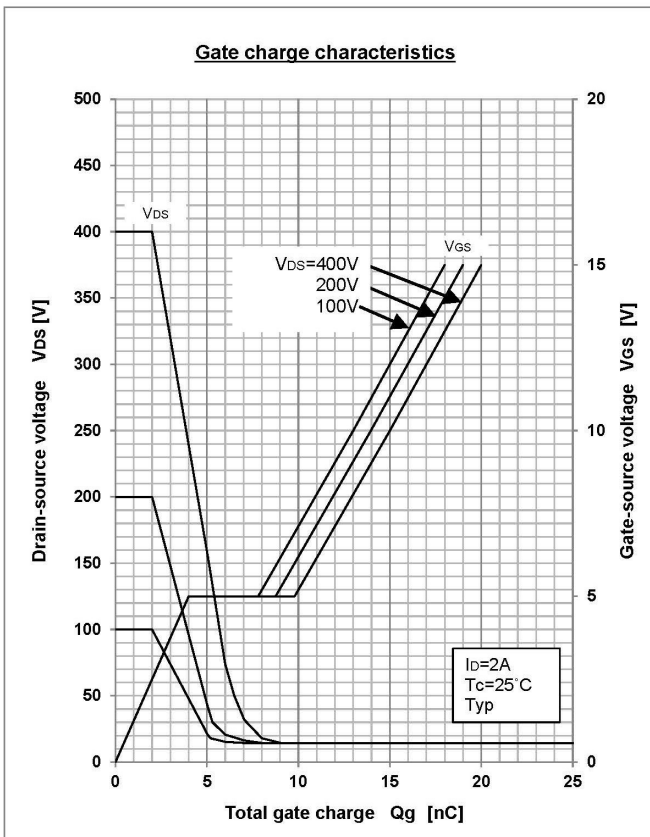
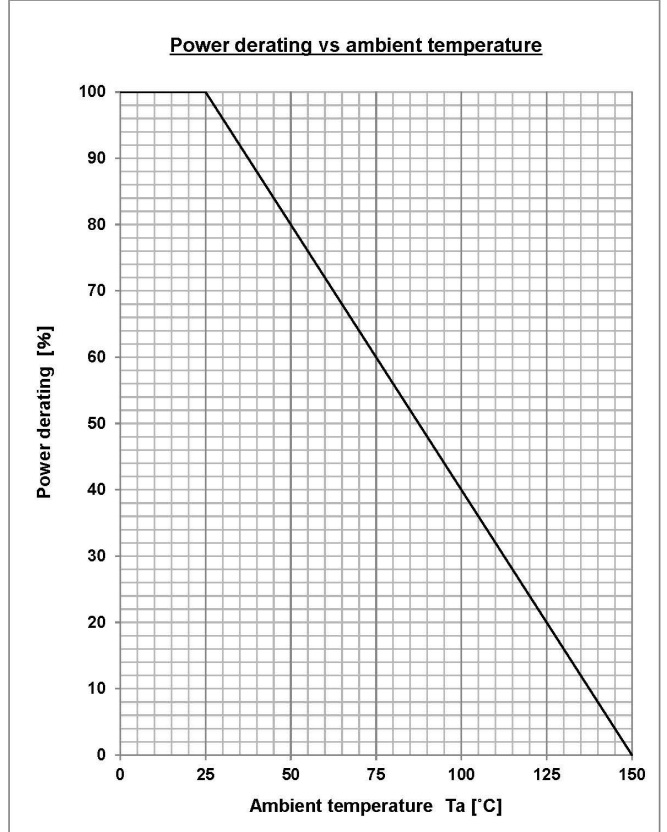
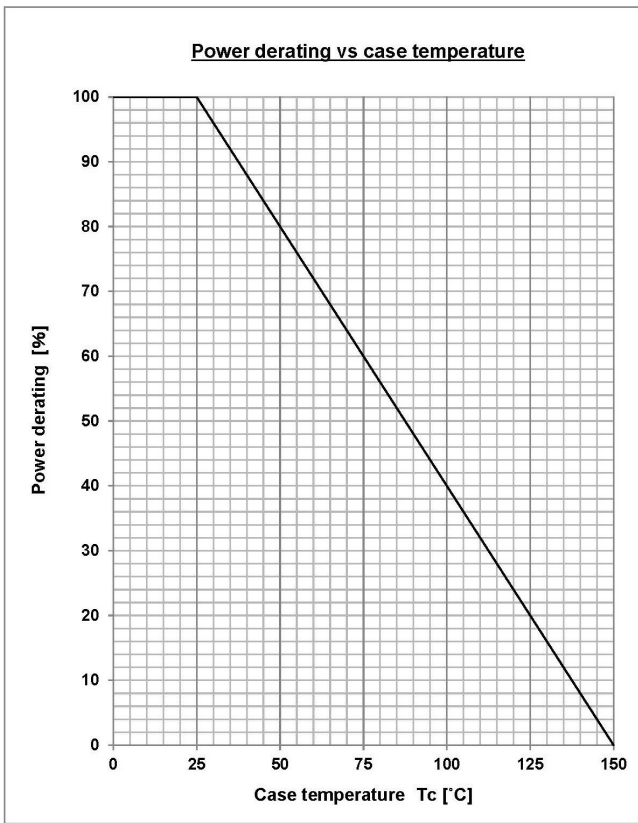


<Substrate detail>

Type	Alumina
Size	1 inch <sup>2</sup>
Thickness	0.64 mm
Conductor thickness	20 μm
Pattern area	65 mm <sup>2</sup>

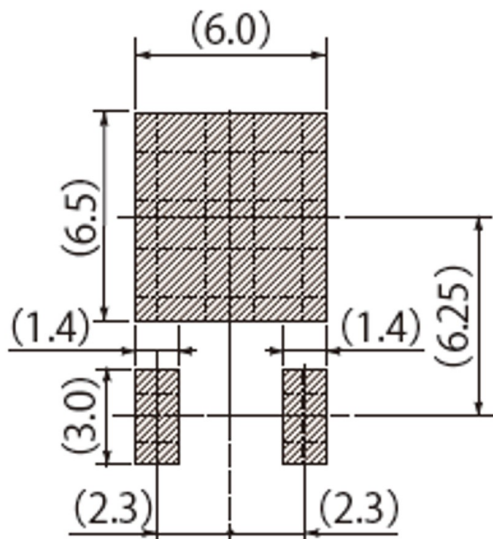
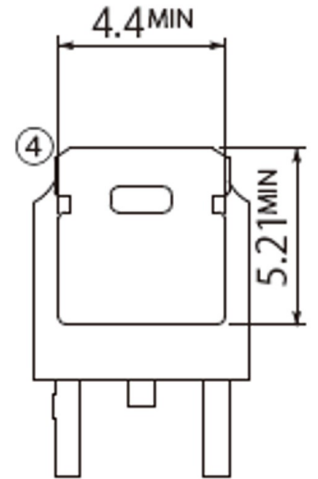
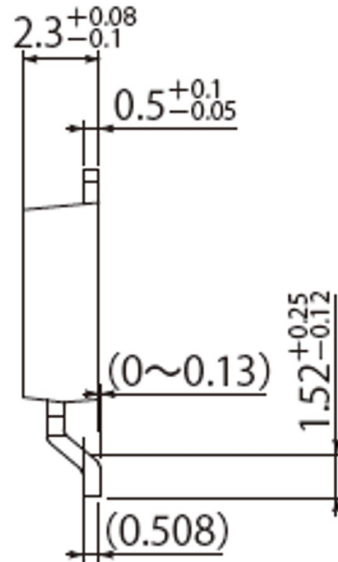
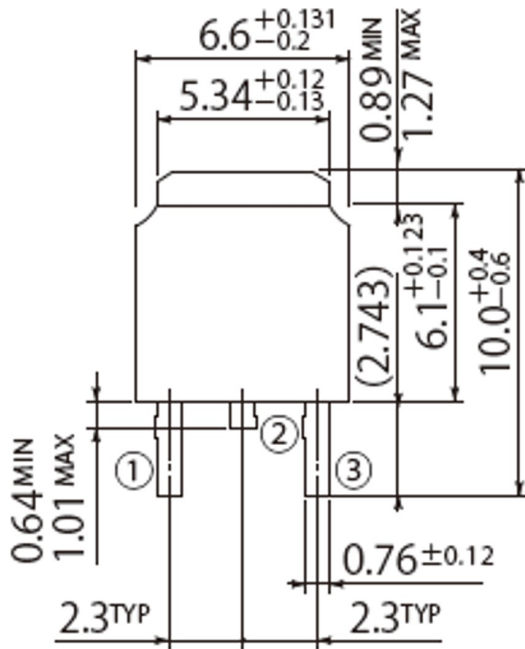
Specification No.





G2

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



Referential Soldering Pad



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