P40B10SL

Power MOSFETs
100V, 40A, N-channel

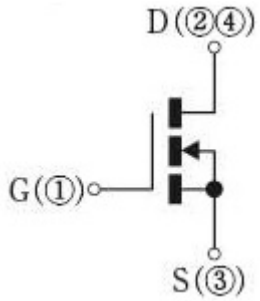
Feature

- 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	Tstg		-55 to 150	°C
Channel tempertature	Tch		-55 to 150	°C
Drain-source voltage	V_{DSS}		100	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		62.5	W
Single avalanche current	I_{AS}	Starting Tch=25°C Tch≦150°C	26	A
Single avalanche energy	E_{AS}	Starting Tch=25°C Tch≦150°C	75	mJ

※ :See the original Specifications

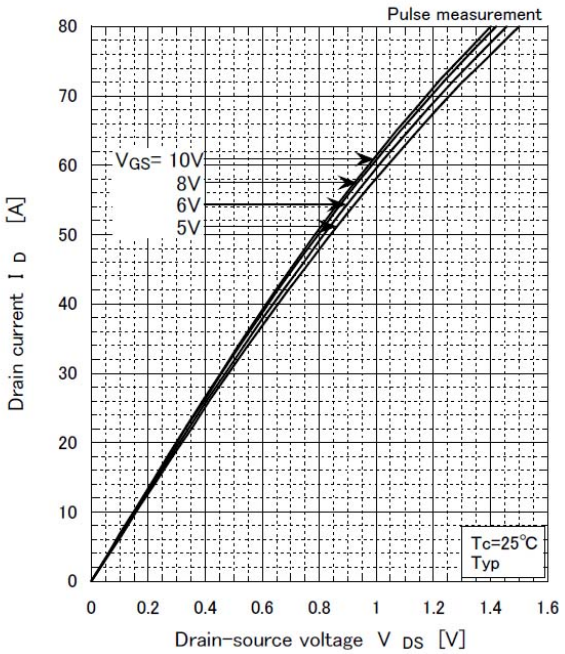
Electrical Characteristics (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	100			V
Zero gate voltage drain current	I_{DSS}	VDS=100V, 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	14.5	29		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=20A, VGS=10V		0.0148	0.0185	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=20A, VGS=4.5V		0.0161	0.0215	Ω
Gate threshold voltage	Vth	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	Rth(j-c)	Junction to case, with heatsink ※			2	°C/W
Total gate charge	Qg	VDD=80V, VGS=10V, ID=40A		66		nC
Gate to source charge	Qgs	VDD=80V, VGS=10V, ID=40A		12		nC
Gate to drain charge	Qgd	VDD=80V, VGS=10V, ID=40A		18.5		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		3210		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		120		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		252		pF
Turn-on delay time	td(on)	ID=20A, RL=2.5Ω, VDD=50V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		5.5		ns
Rise time	tr	ID=20A, RL=2.5Ω, VDD=50V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		19		ns
Turn-off delay time	td(off)	ID=20A, RL=2.5Ω, VDD=50V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		47		ns
Fall time	tf	ID=20A, RL=2.5Ω, VDD=50V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		31		ns
Diode reverse recovery time	trr	IF=40A, VGS=0V, di/dt=100A/μs		54		ns
Diode reverse recovery charge	Qrr	IF=40A, VGS=0V, di/dt=100A/μs		107		nC

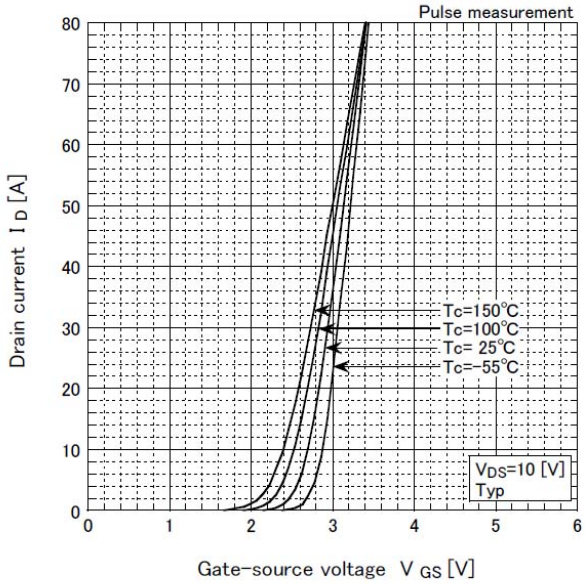
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

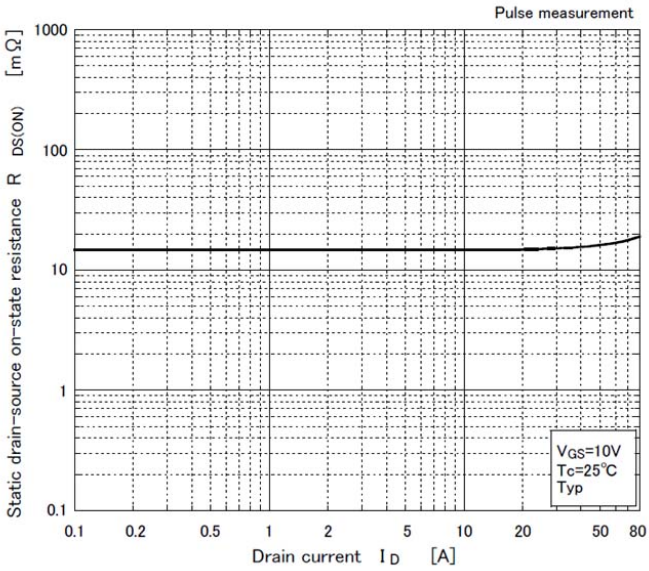
Typical output characteristics



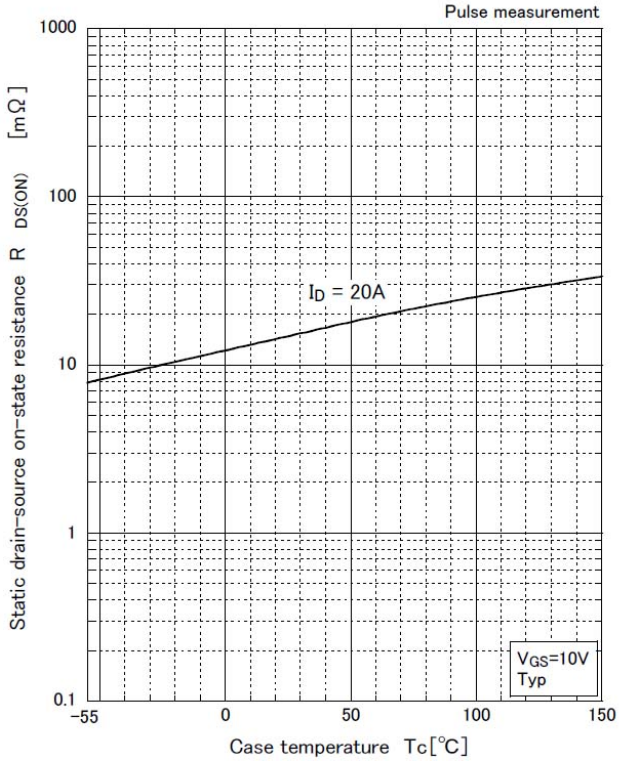
Transfer characteristics



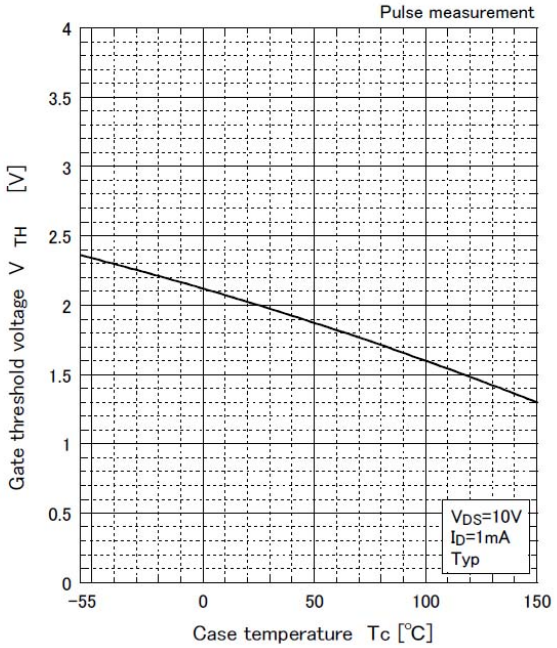
Static drain-source on-state resistance vs drain current



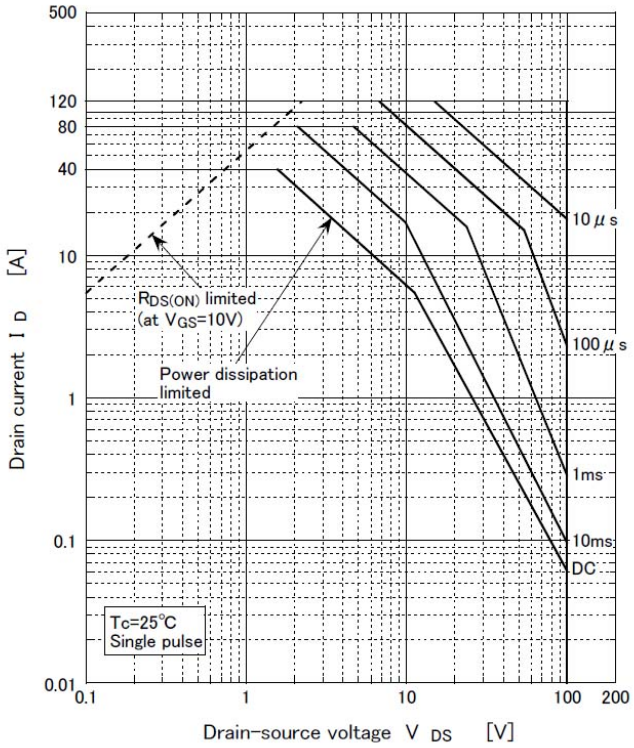
Static drain-source on-state resistance vs case temperature



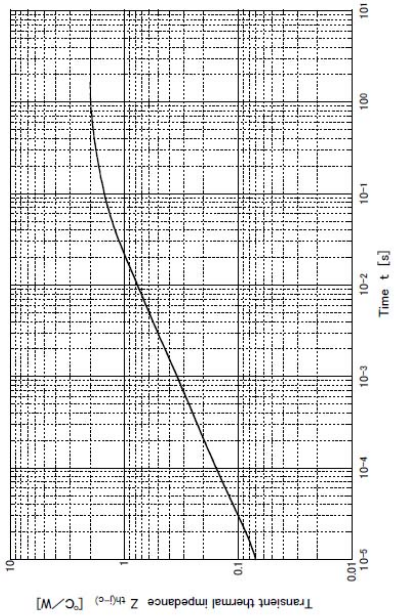
Gate threshold voltage
vs case temperature



Safe operating area



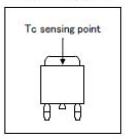
Transient thermal impedance



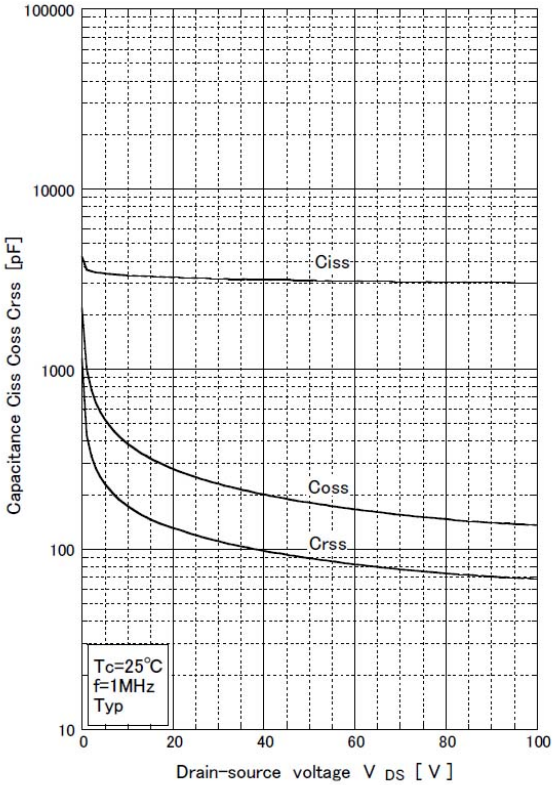
Substrate detail

Type	Alumina
Size	1 inch²
Thickness	0.64mm
Conductor thickness	20μm
Pattern area	65mm²

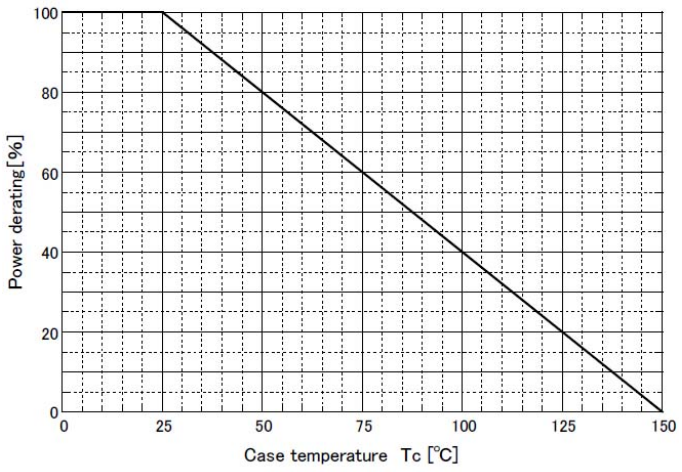
Tc sensing point



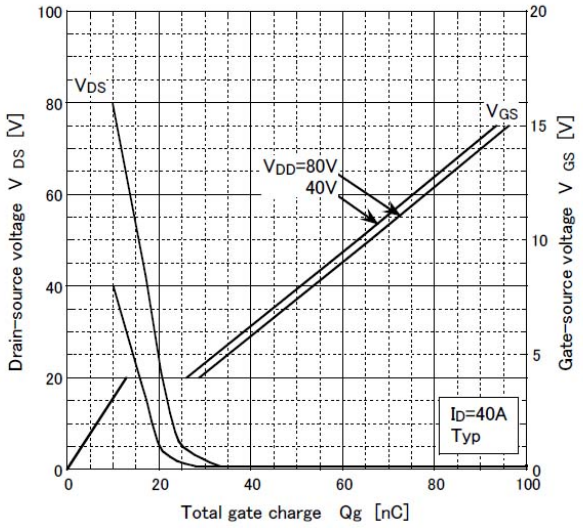
Capacitance characteristics



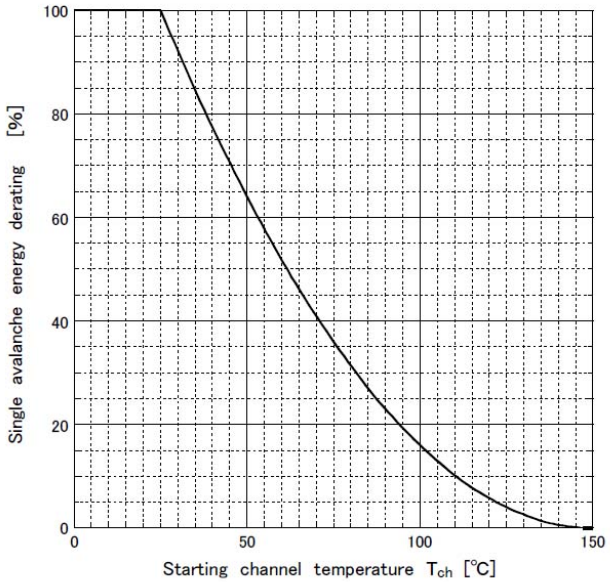
Power derating – case temperature



Gate charge characteristics



Single avalanche energy derating
vs channel temperature

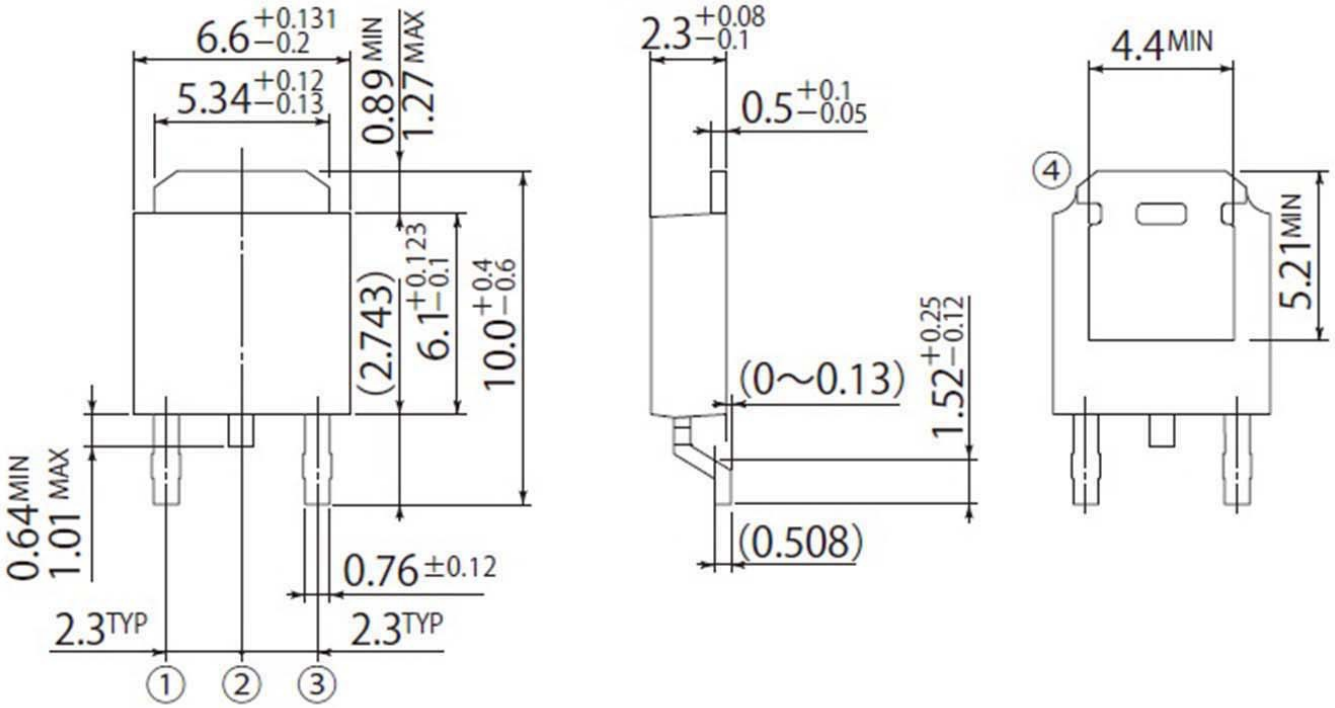


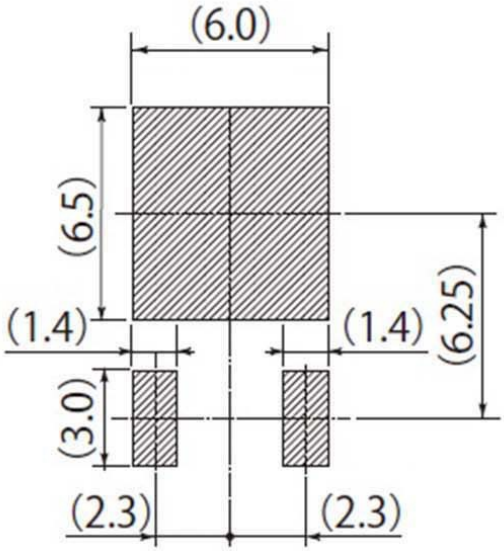
Outline Dimensions

unit:mm

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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