P60B4EL

Power MOSFETs
40V, 60A, N-channel

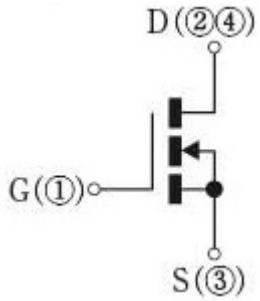
Feature

- 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℃)

Item	Symbol	Conditions	Ratings	Unit
Storage temperrature	Tstg		-55 to 150	℃
Channel tempertature	Tch		150	℃
Drain-source voltage	V_{DSS}		40	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current(DC)	I_D		60	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	240	A
Total power dissipation	P_T		62.5	W
Single avalanche current	I_{AS}	Starting Tch=25℃ Tch≦150℃	40	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	175	mJ

※ :See the original Specifications

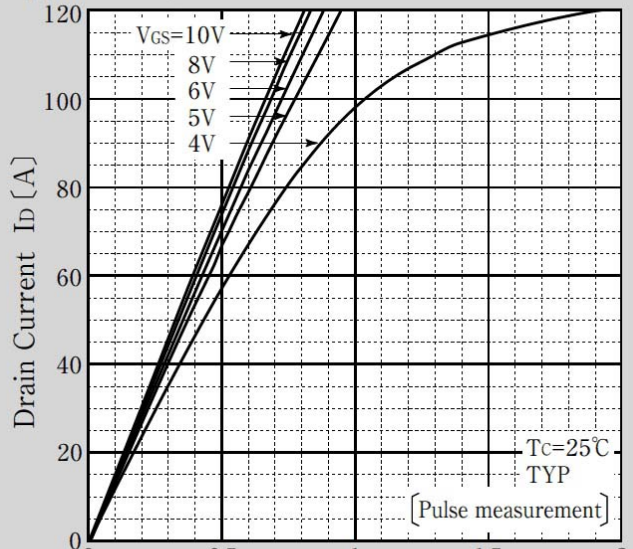
Electrical Characteristics (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	40			V
Zero gate voltage drain current	I_{DSS}	VDS=40V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=30A, VDS=10V	19	38		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=30A, VGS=10V		0.0033	0.0042	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=30A, VGS=4.5V		0.0046	0.0062	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	1.5	2	2.5	V
Source-drain diode forward voltage	V_{SD}	IS=60A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case			2	°C/W
Total gate charge	Qg	VDD=32V, VGS=10V, ID=60A		57		nC
Gate to source charge	Qgs	VDD=32V, VGS=10V, ID=60A		10		nC
Gate to drain charge	Qgd	VDD=32V, VGS=10V, ID=60A		18		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		2900		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		280		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		500		pF
Turn-on delay time	td(on)	ID=30A, RL=0.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		10		ns
Rise time	tr	ID=30A, RL=0.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		24		ns
Turn-off delay time	td(off)	ID=30A, RL=0.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		22		ns
Fall time	tf	ID=30A, RL=0.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		4		ns
Diode reverse recovery time	trr	IF=60A, VGS=0V, di/dt=100A/μs		40		ns
Diode reverse recovery charge	Qrr	IF=60A, VGS=0V, di/dt=100A/μs		47		nC

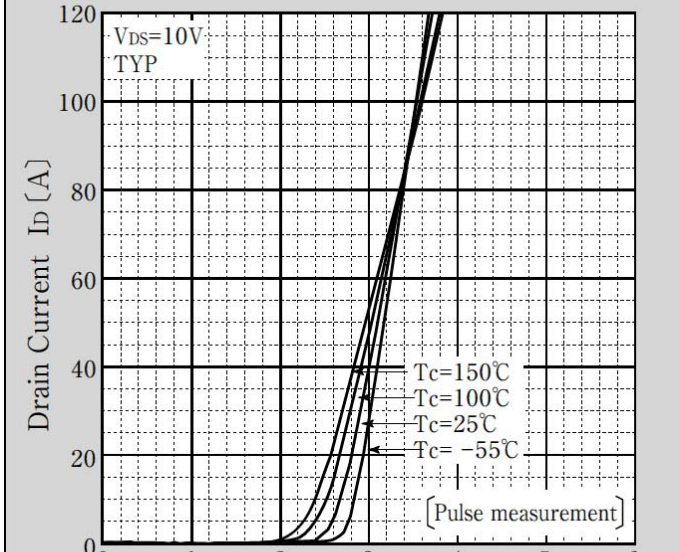
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

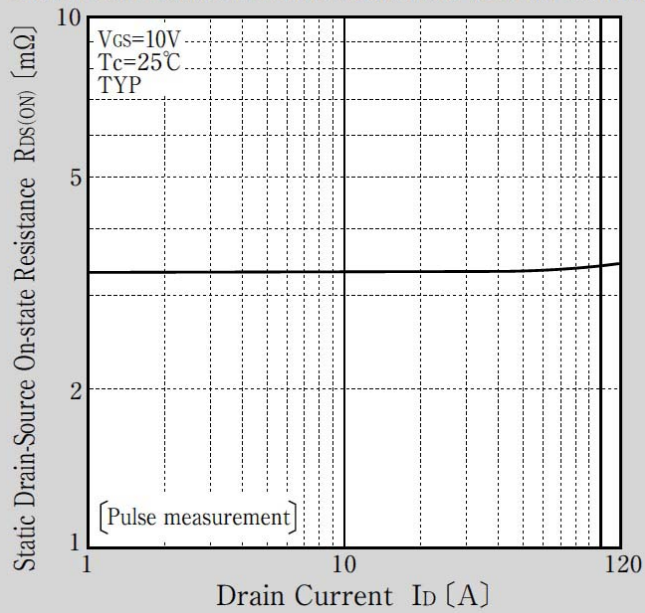
Typical Output Characteristics



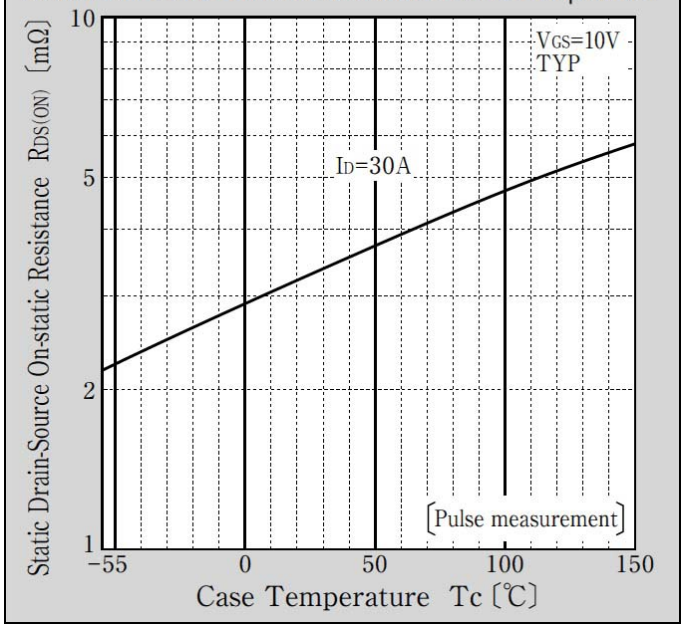
Transfer Characteristics



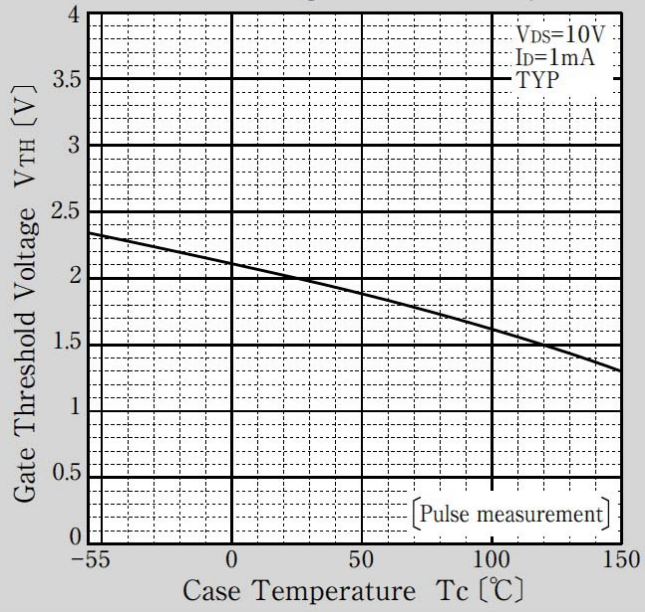
Static Drain-Source On-state Resistance vs Drain Current



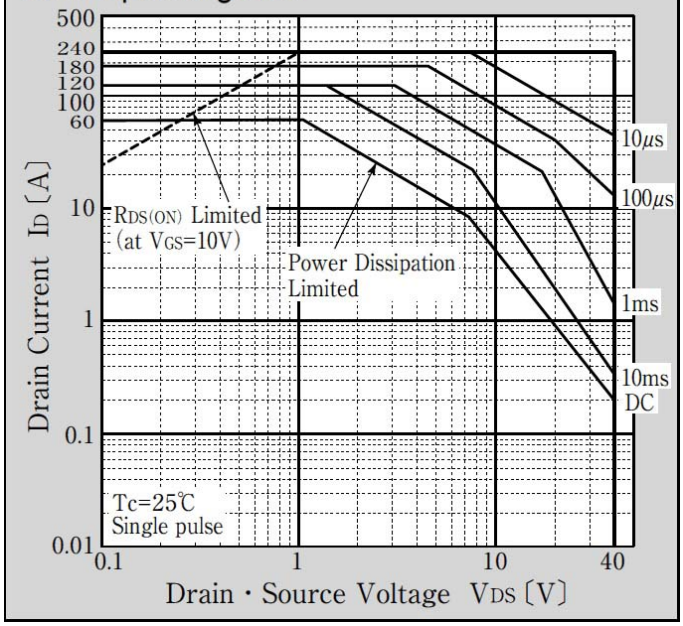
Static Drain-Source On-static Resistance vs Case Temperature



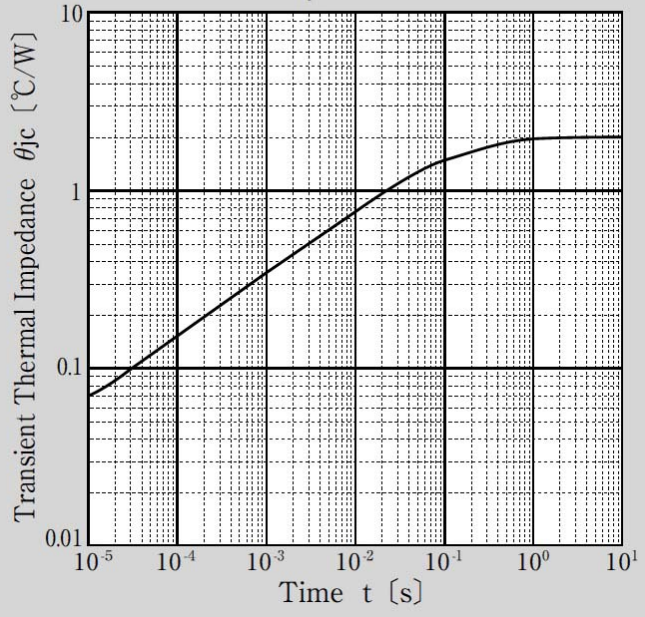
Gate Threshold Voltage vs Case Temperature



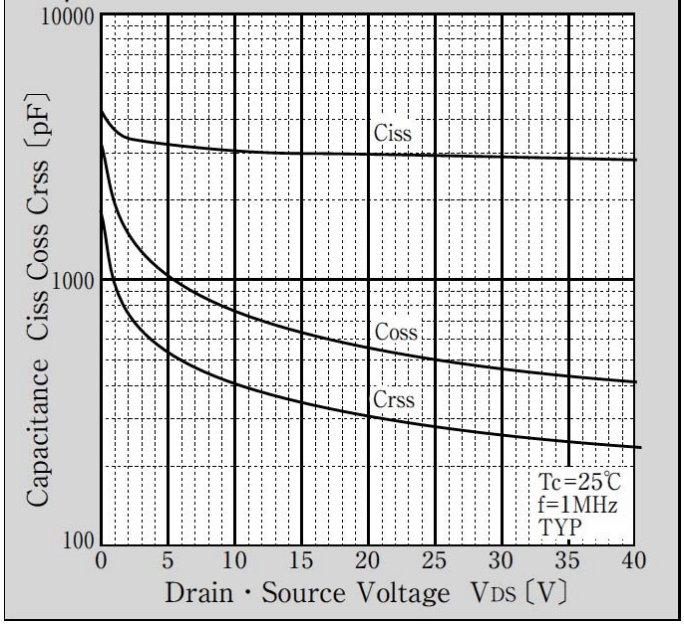
Safe Operating Area

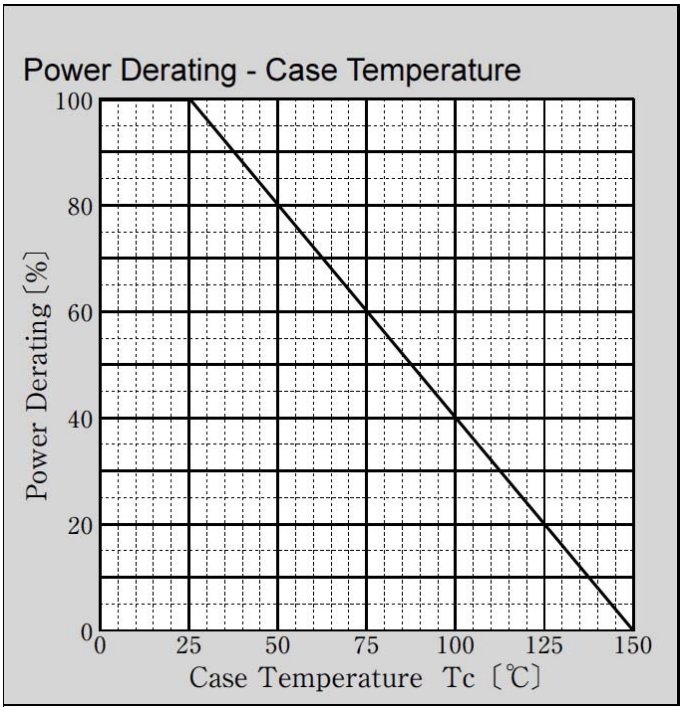


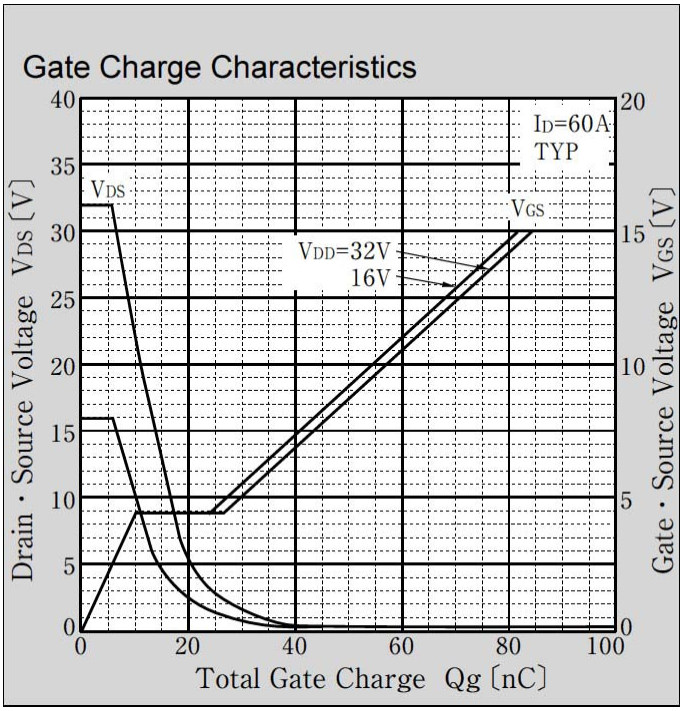
Transient Thermal Impedance

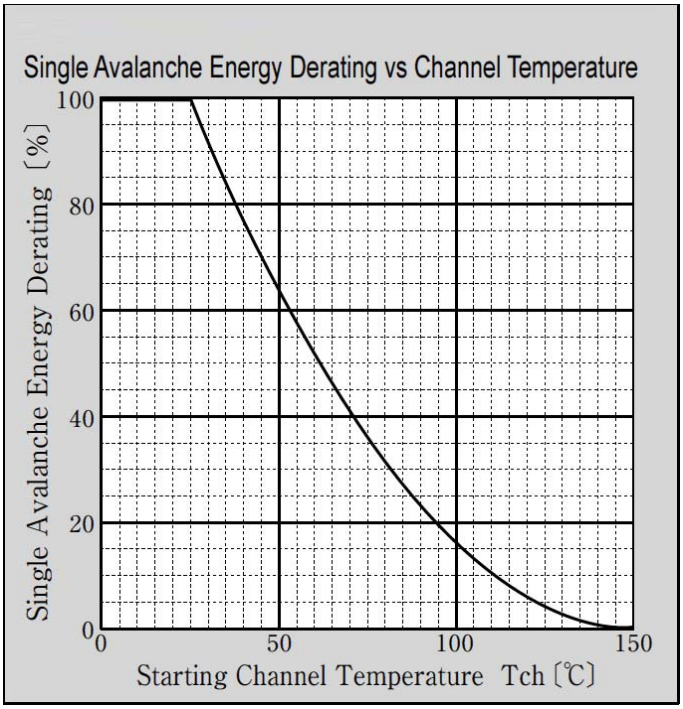


Capacitance Characteristics




Power Derating - Case Temperature
Power Derating〔%〕
100
80
60
40
20
0
0
25
50
75
100
125
150
Case Temperature Tc〔℃〕


Gate Charge Characteristics
ID=60A
TYP
VDS
VGS
VDD=32V
16V
Drain・Source Voltage VDS〔V〕
Gate・Source Voltage VGS〔V〕
40
35
30
25
20
15
10
5
0
20
15
10
5
0
0
20
40
60
80
100
Total Gate Charge Qg〔nC〕


Single Avalanche Energy Derating vs Channel Temperature
Single Avalanche Energy Derating〔%〕
100
80
60
40
20
0
0
50
100
150
Starting Channel Temperature Tch〔℃〕

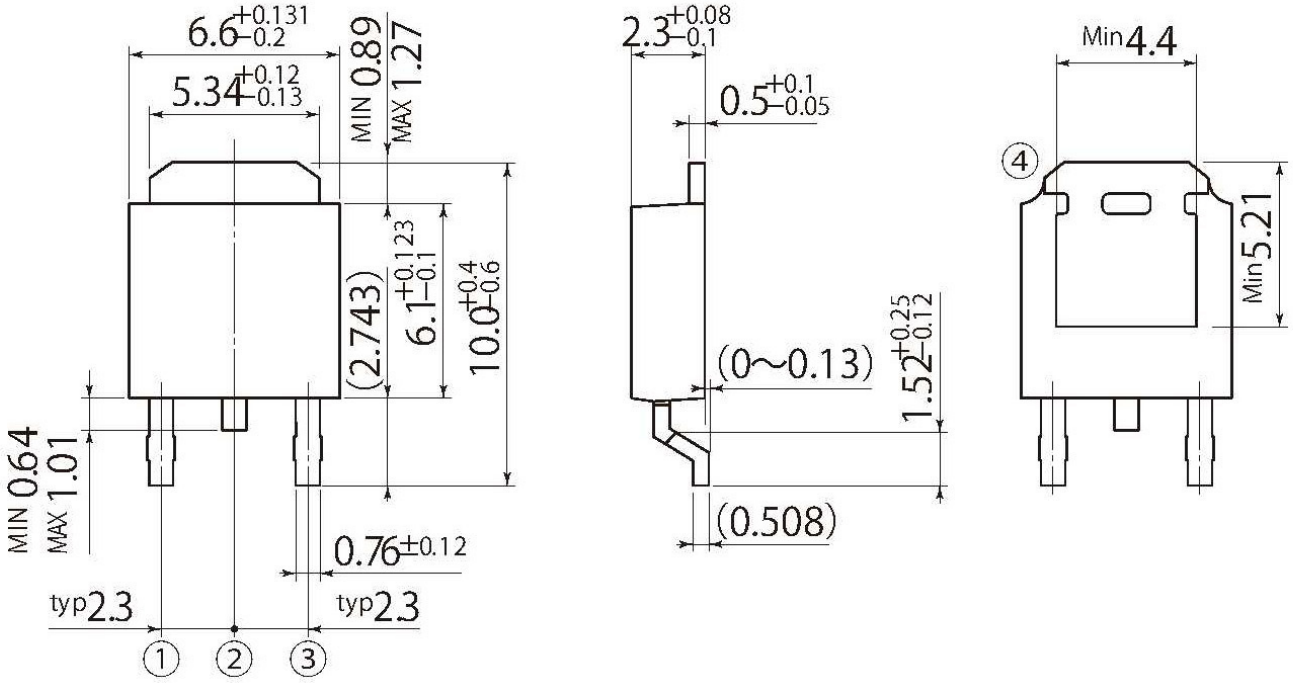
Outline Dimensions

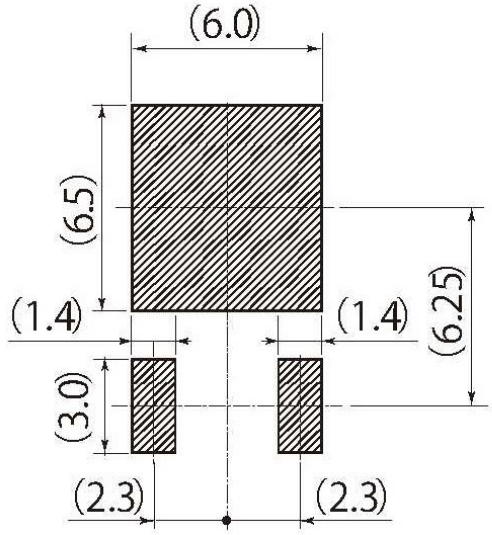
unit:mm

scale: 4/1

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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