

P54B4SN

Power MOSFETs

40V, 54A, N-channel

Feature

- N-channel
- SMD
- Low Ron
- 10V Gate Drive
- Low Capacitance
- Pb free terminal
- RoHS:Yes

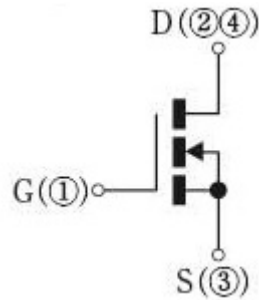
OUTLINE

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}		40	V
Gate-source voltage	V _{GSS}		±20	V
Continuous drain current(DC)	I _D		54	A
Continuous drain current(Peak)	I _{DP}	Pulse width 10μs, duty=1/100	162	A
Total power dissipation	P _T		44	W
Single avalanche current	I _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	28	A
Single avalanche energy	E _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	84	mJ

* :See the original Specifications

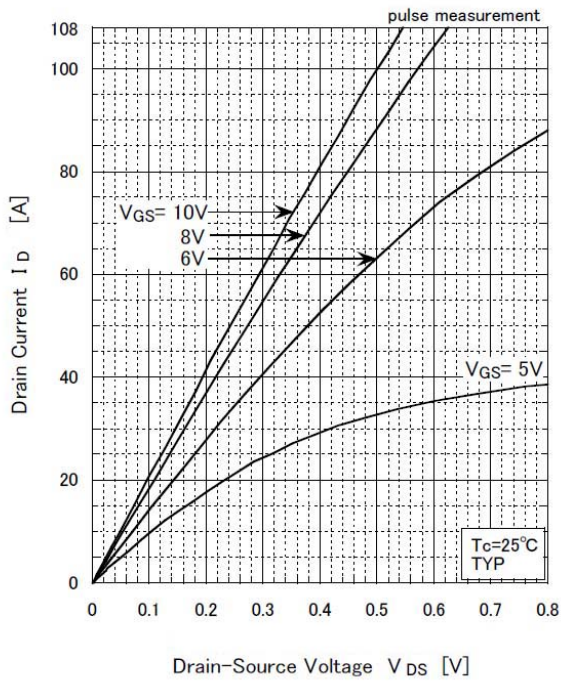
Electrical Characteristics (unless otherwise specified : Tc=25°C)

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=27A, VDS=10V	9	18		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=27A, VGS=10V		0.005	0.0063	Ω
Gate threshold voltage	V_{th}	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	V_{SD}	IS=54A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case			2.84	°C/W
Total gate charge	Q_g	VDD=32V, VGS=10V, ID=54A		38		nC
Gate to source charge	Q_{gs}	VDD=32V, VGS=10V, ID=54A		11		nC
Gate to drain charge	Q_{gd}	VDD=32V, VGS=10V, ID=54A		16		nC
Input capacitance	C_{iss}	VDS=25V, VGS=0V, f=1MHz		1660		pF
Reverse transfer capacitance	C_{rss}	VDS=25V, VGS=0V, f=1MHz		170		pF
Output capacitance	C_{oss}	VDS=25V, VGS=0V, f=1MHz		330		pF
Turn-on delay time	$t_{d(on)}$	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		6.5		ns
Rise time	t_r	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		24		ns
Turn-off delay time	$t_{d(off)}$	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		19		ns
Fall time	t_f	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		9		ns
Diode reverse recovery time	t_{rr}	IF=54A, VGS=0V, di/dt=100A/μs		41		ns
Diode reverse recovery charge	Q_{rr}	IF=54A, VGS=0V, di/dt=100A/μs		46		nC

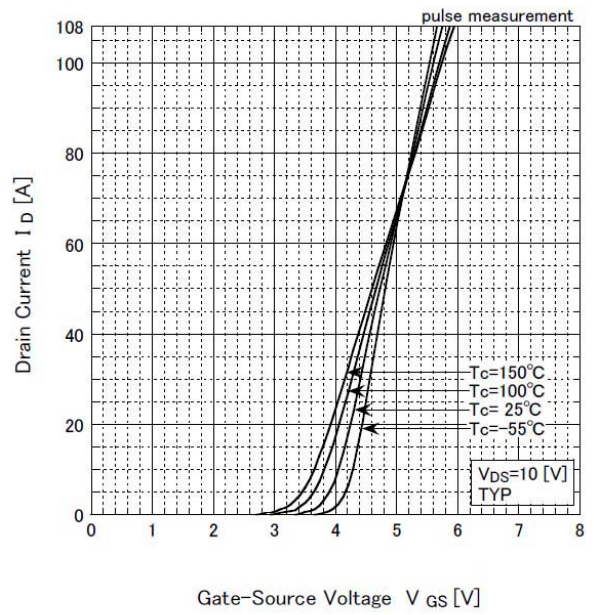
※ : See the original Specifications

CHARACTERISTIC DIAGRAMS

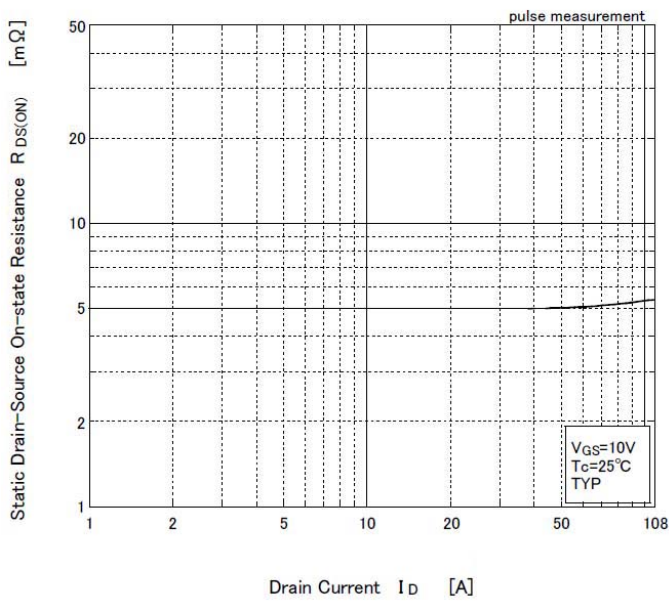
Typical Output Characteristics



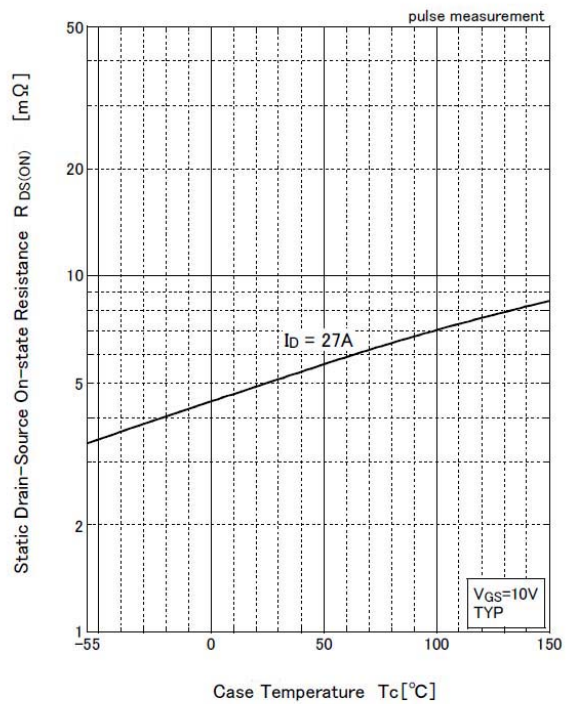
Transfer Characteristics

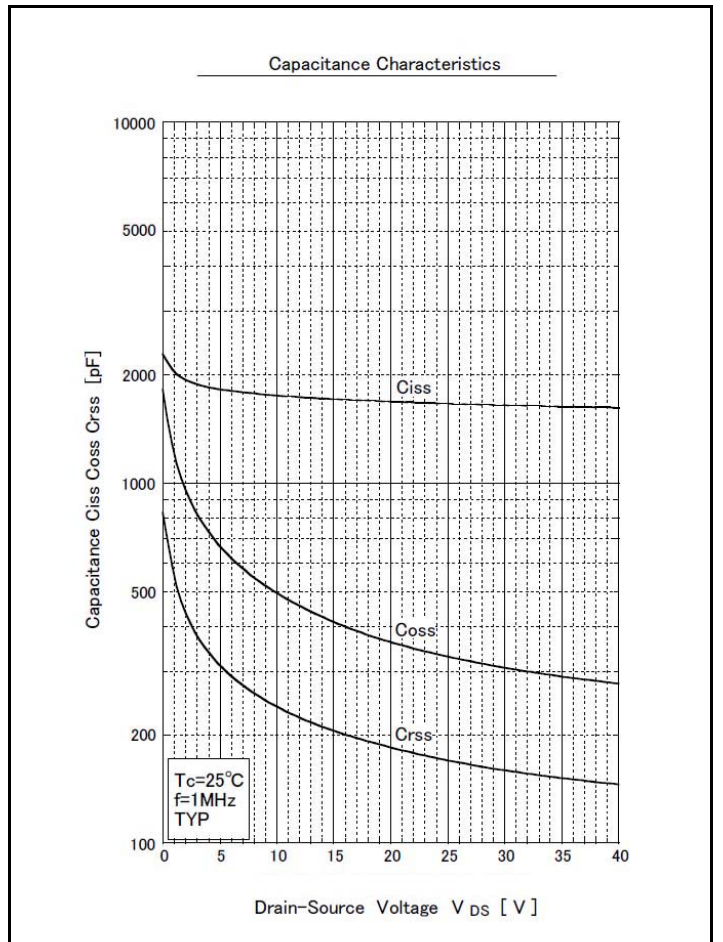
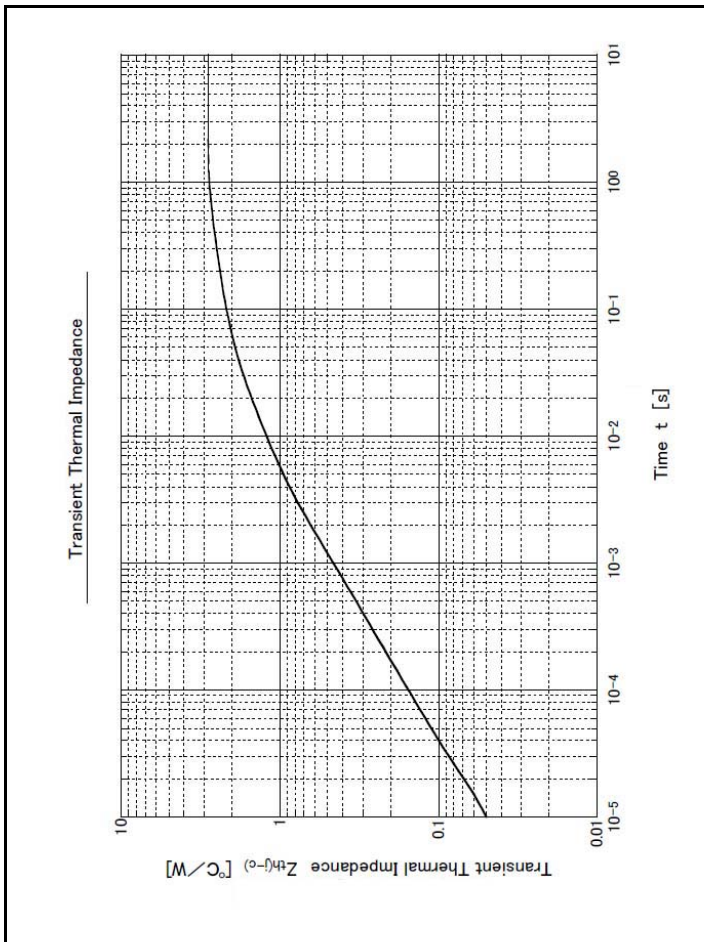
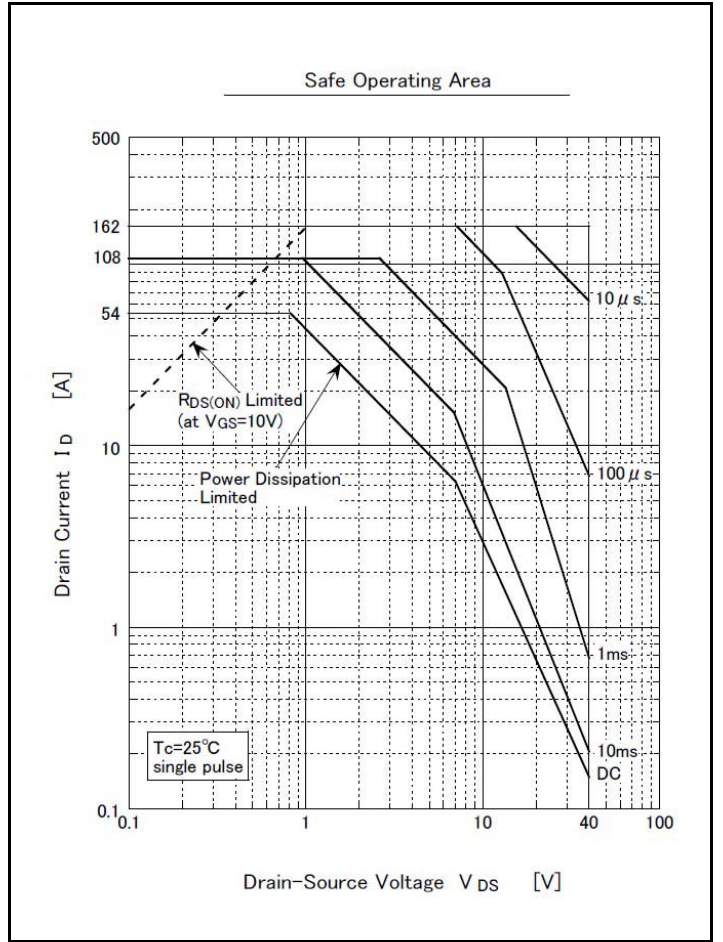
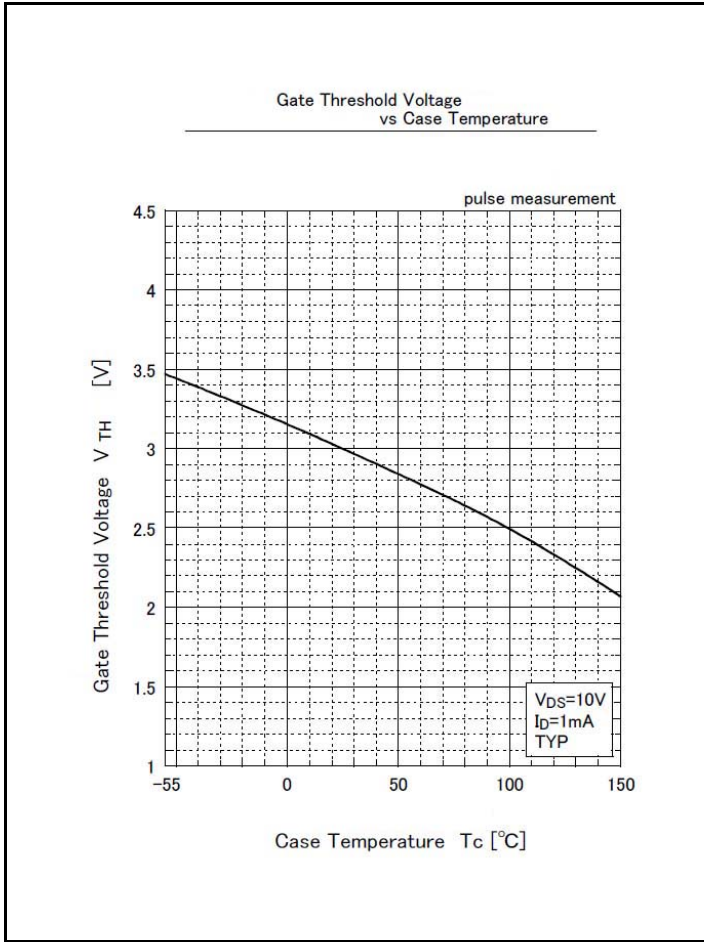


Static Drain-Source On-state Resistance vs Drain Current

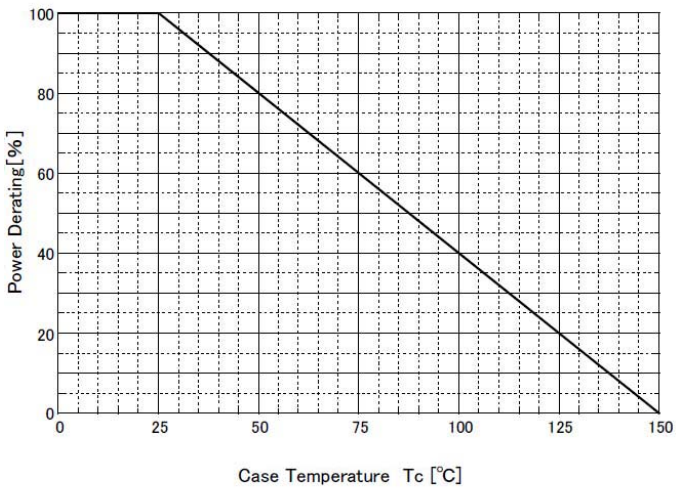


Static Drain-Source On-state Resistance vs Case Temperature

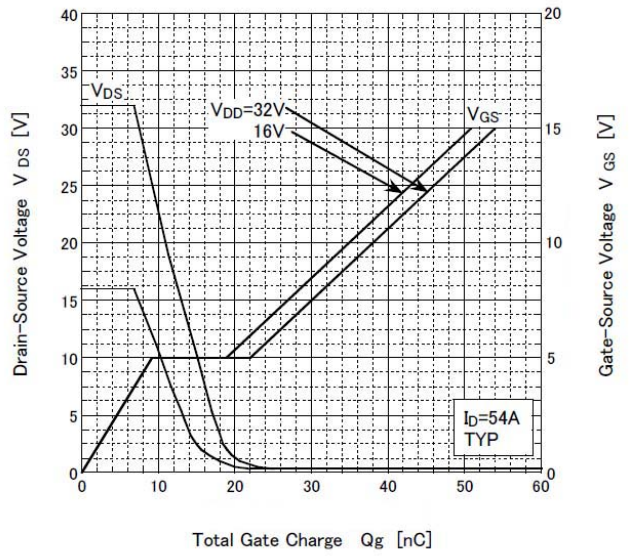




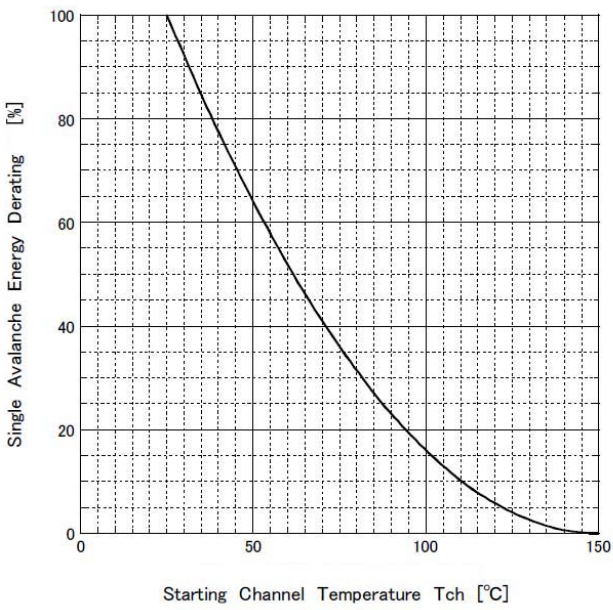
Power Derating - Case Temperature



Gate Charge Characteristics

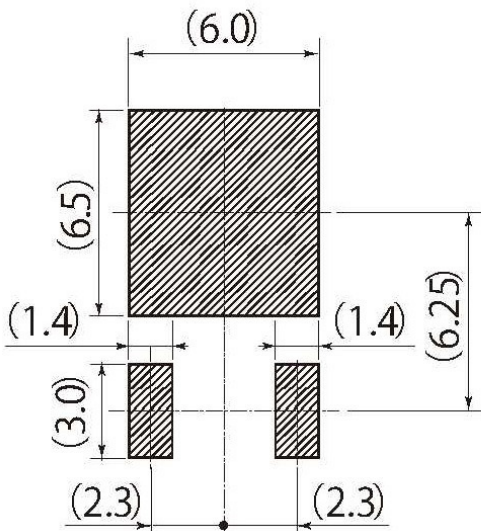
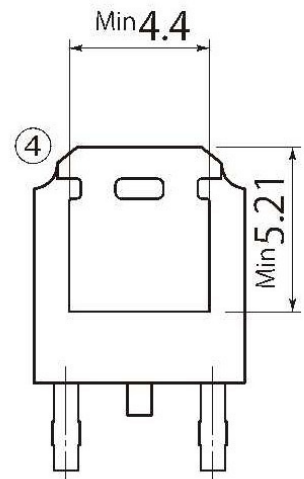
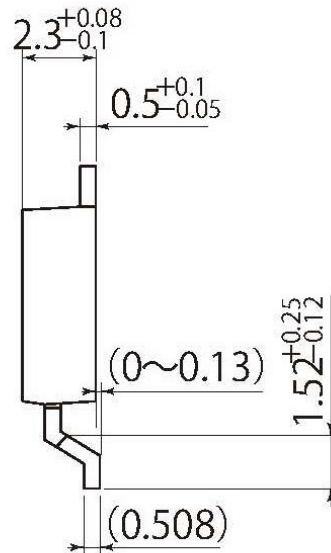
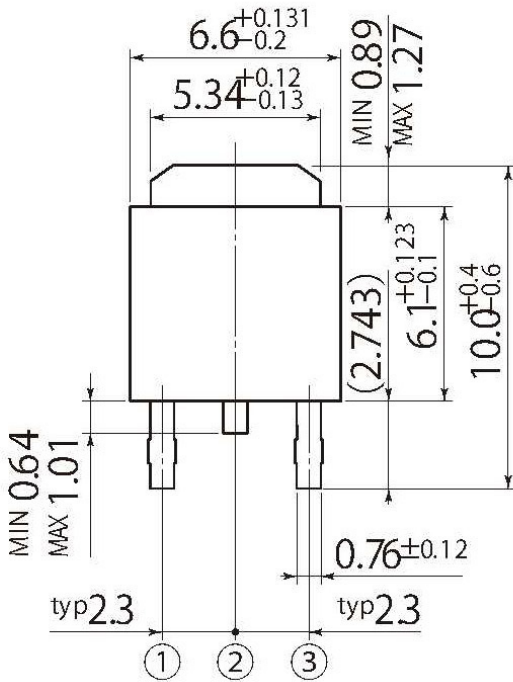


Single Avalanche Energy Derating vs Channel Temperature



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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