

P54B4SLK

Power MOSFETs

40V, 54A, N-channel

Feature

- N-channel
- SMD
- Low Ron
- 4.5V Gate Drive
- Low Capacitance
- Based on AEC-Q101
- Halogen free • Pb free terminal
- RoHS:Yes

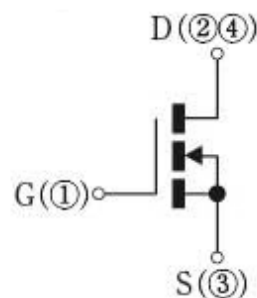
OUTLINE

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	Tstg		-55 to 175	°C
Channel temperature	Tch		-55 to 175	°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
Continuous source current(DC)	I _S		54	A
Total power dissipation	P _T	With heatsink※	46	W
Total power dissipation	P _T	Measured on the 1 inch ² glass epoxy substrate pattern area : 586.81mm ²	3.3	W
Total power dissipation	P _T	Measured on the 1 inch ² glass epoxy substrate pattern area : 102.19mm ²	2	W
Single avalanche current	I _{AS}	Starting Tch=25°C Tch≤150°C	27	A
Single avalanche energy	E _{AS}	Starting Tch=25°C Tch≤150°C	73	mJ

※ : See the original Specifications

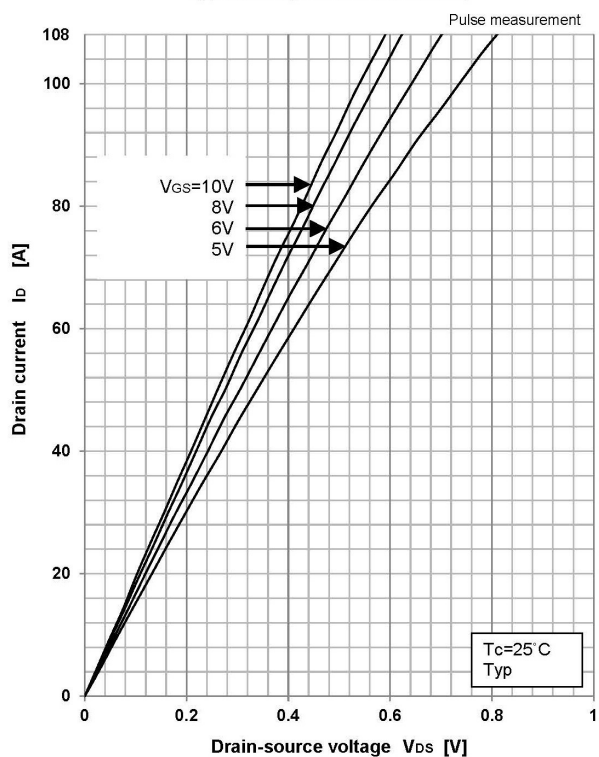
Electrical Characteristics (unless otherwise specified : Tc=25°C)

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	12			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=27A, VGS=10V		0.0052	0.0065	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=27A, VGS=4.5V		0.0072	0.0096	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	1.5	2	2.5	V
Source-drain diode forward voltage	V_{SD}	IS=54A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink ※			3.2	°C/W
Thermal resistance	Rth(j-a)	Junction to ambient Measured on the 1 inch ² glass epoxy substrate pattern area : 586.81mm ²			45	°C/W
Thermal resistance	Rth(j-a)	Junction to ambient Measured on the 1 inch ² glass epoxy substrate pattern area : 102.19mm ²			75	°C/W
Total gate charge	Qg	VDD=32V, VGS=10V, ID=54A		43		nC
Gate to source charge	Qgs	VDD=32V, VGS=10V, ID=54A		8		nC
Gate to drain charge	Qgd	VDD=32V, VGS=10V, ID=54A		12		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		2020		pF
Reverse transfer capacitance	Crss	VDS=25V, VGS=0V, f=1MHz		159		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		300		pF
Turn-on delay time	td(on)	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		5		ns
Rise time	tr	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		20		ns
Turn-off delay time	td(off)	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		32		ns
Fall time	tf	ID=27A, RL=0.74Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		22		ns
Diode reverse recovery time	trr	IF=54A, VGS=0V, di/dt=100A/μs		36		ns
Diode reverse recovery charge	Qrr	IF=54A, VGS=0V, di/dt=100A/μs		33		nC

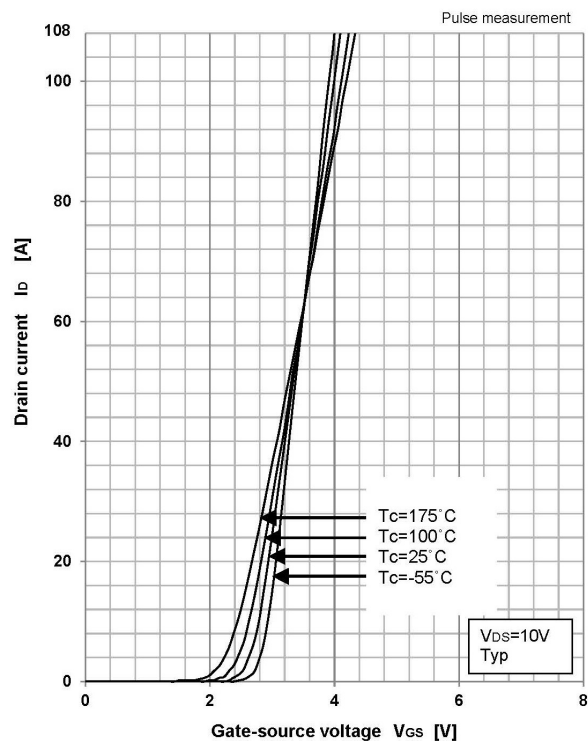
※ : See the original Specifications

CHARACTERISTIC DIAGRAMS

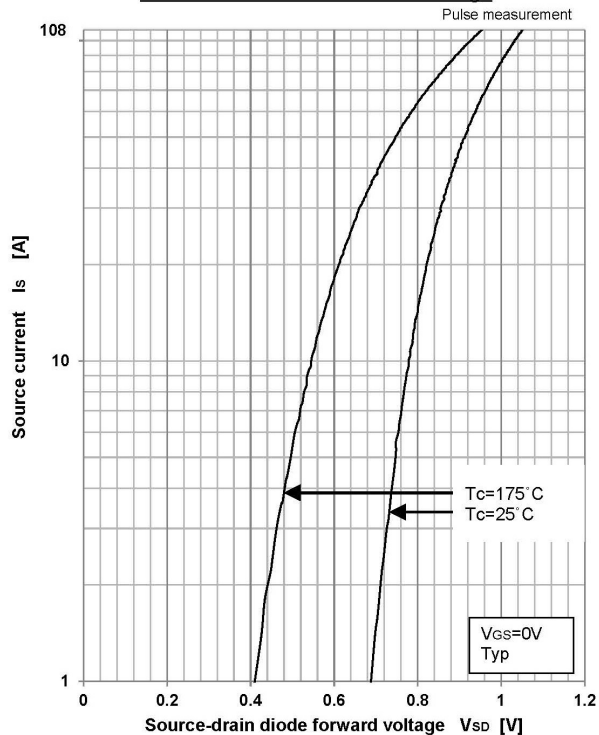
Typical output characteristics



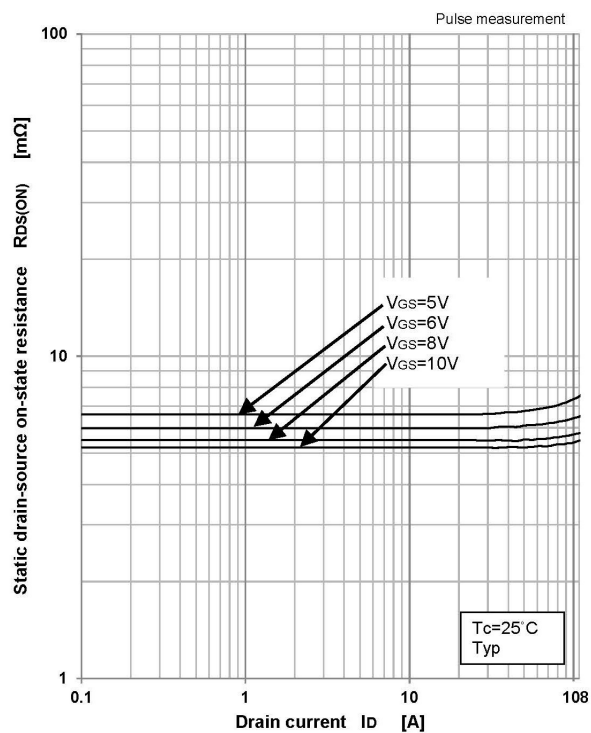
Transfer characteristics

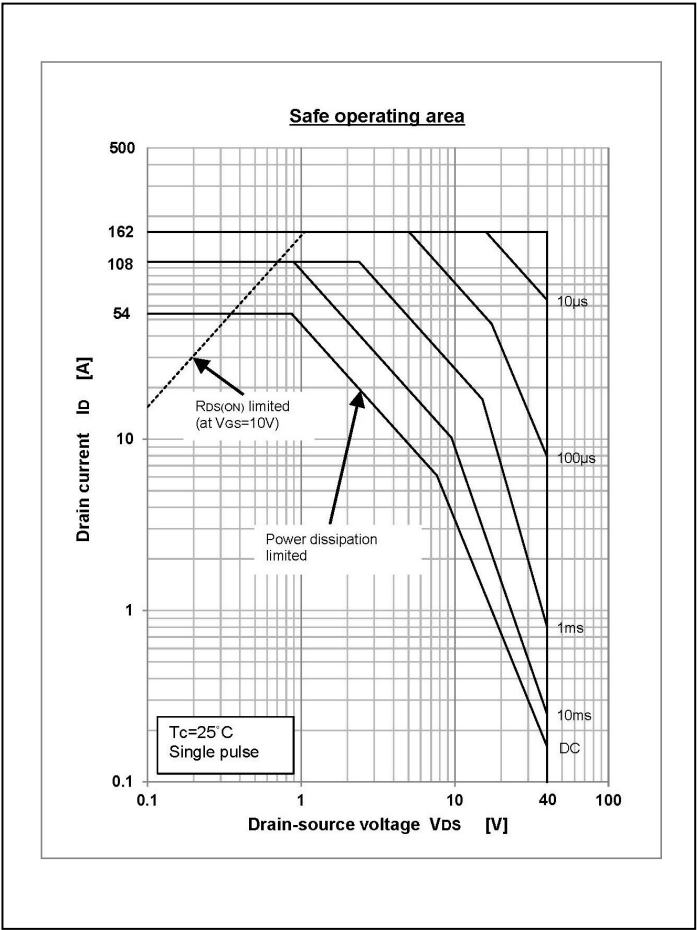
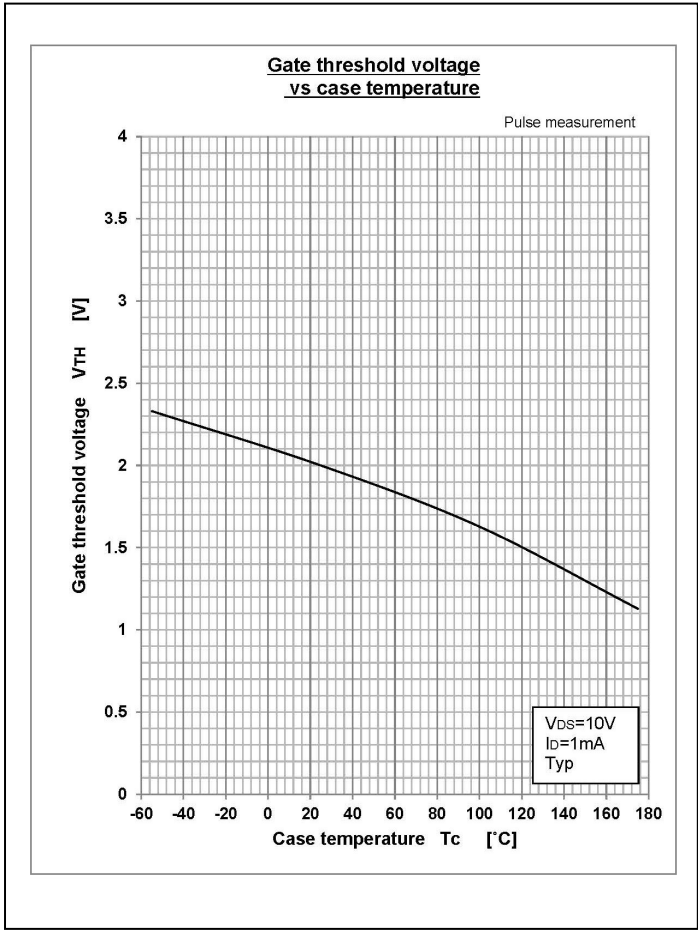
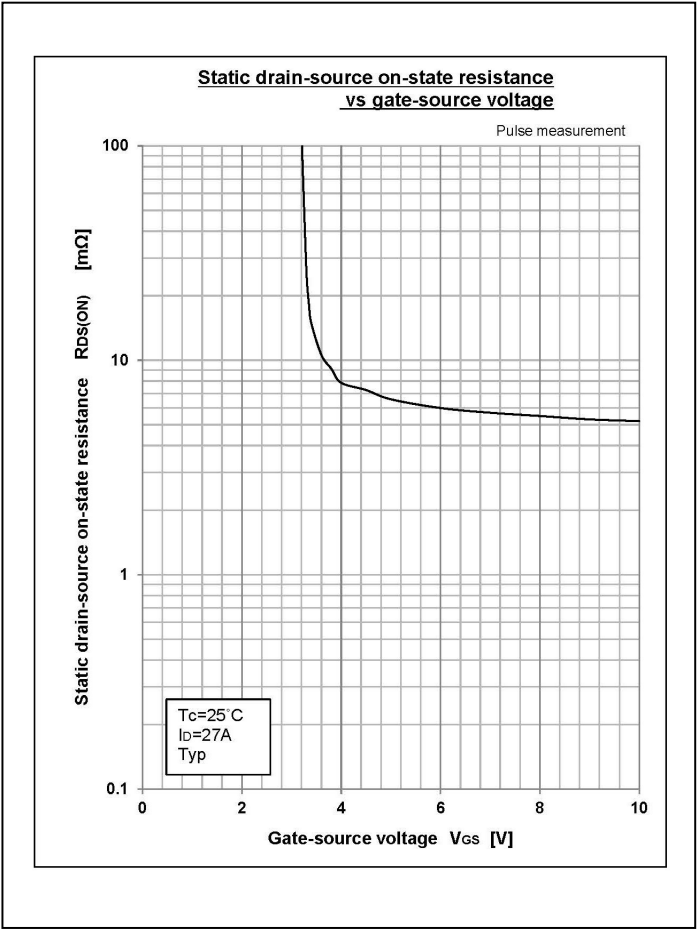
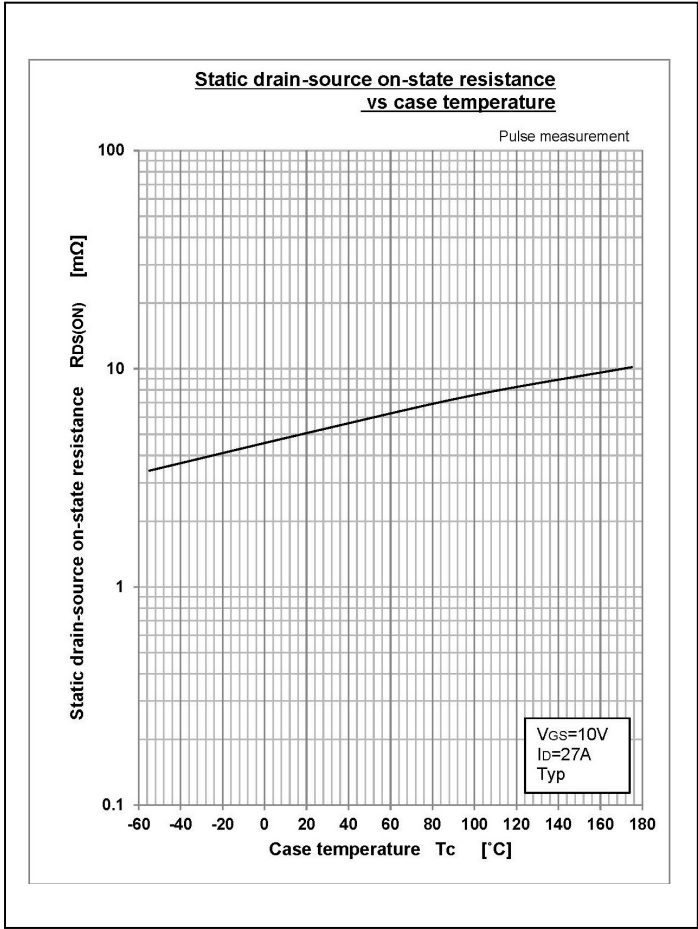


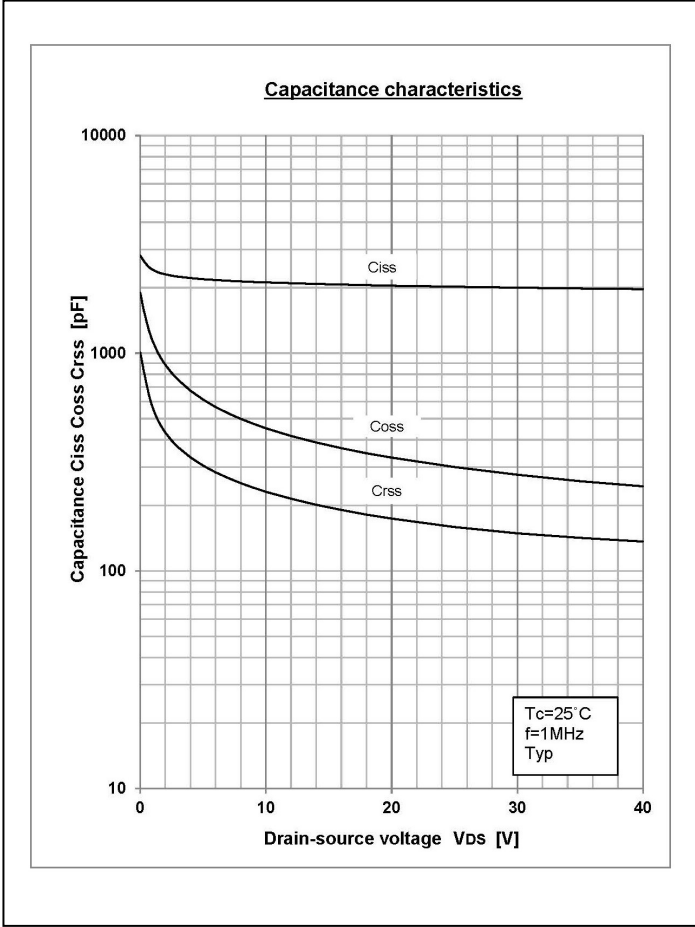
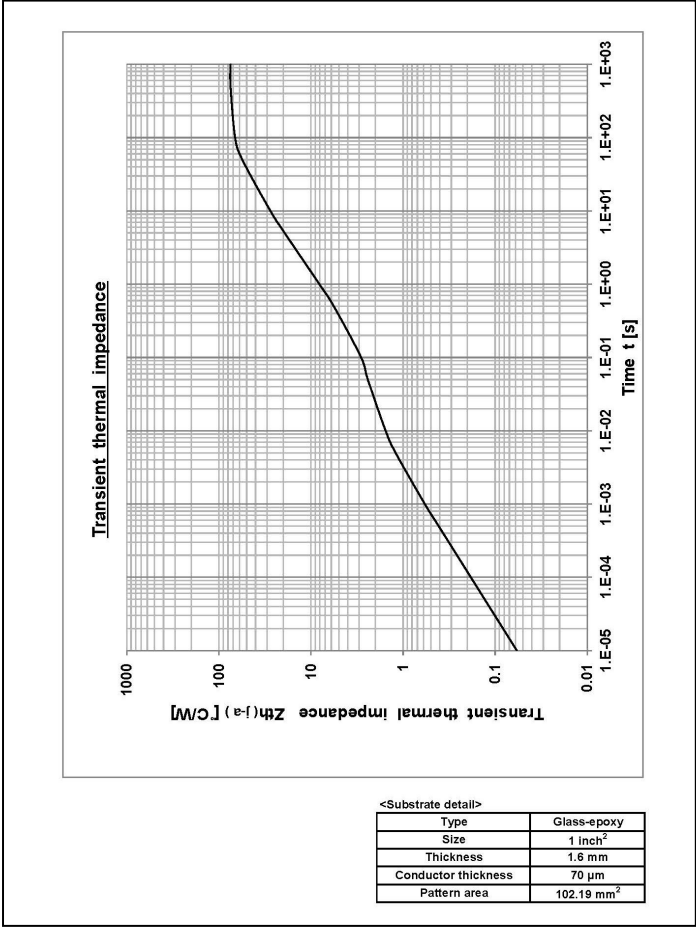
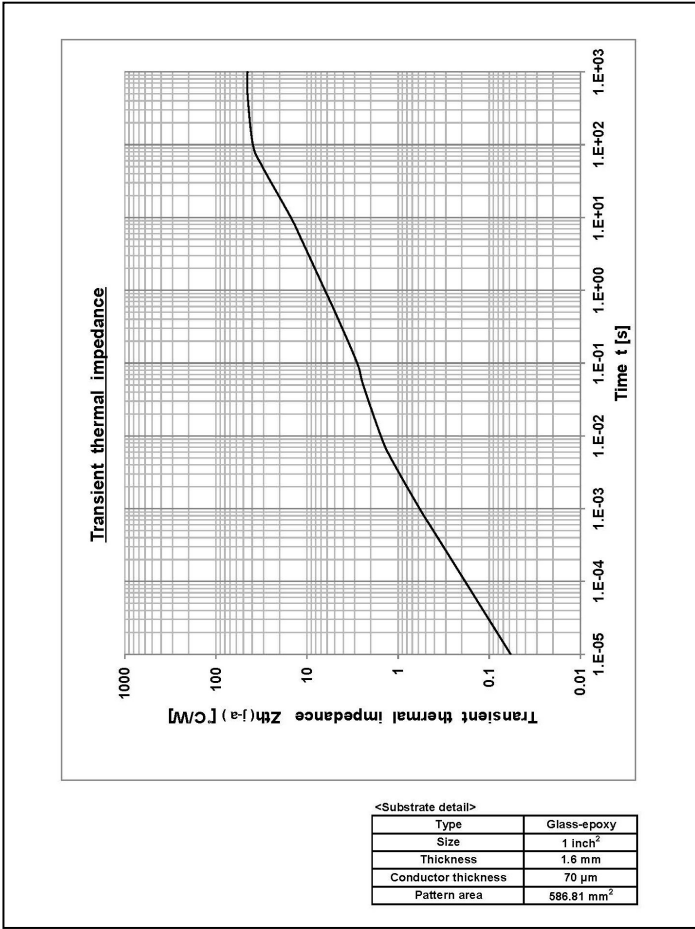
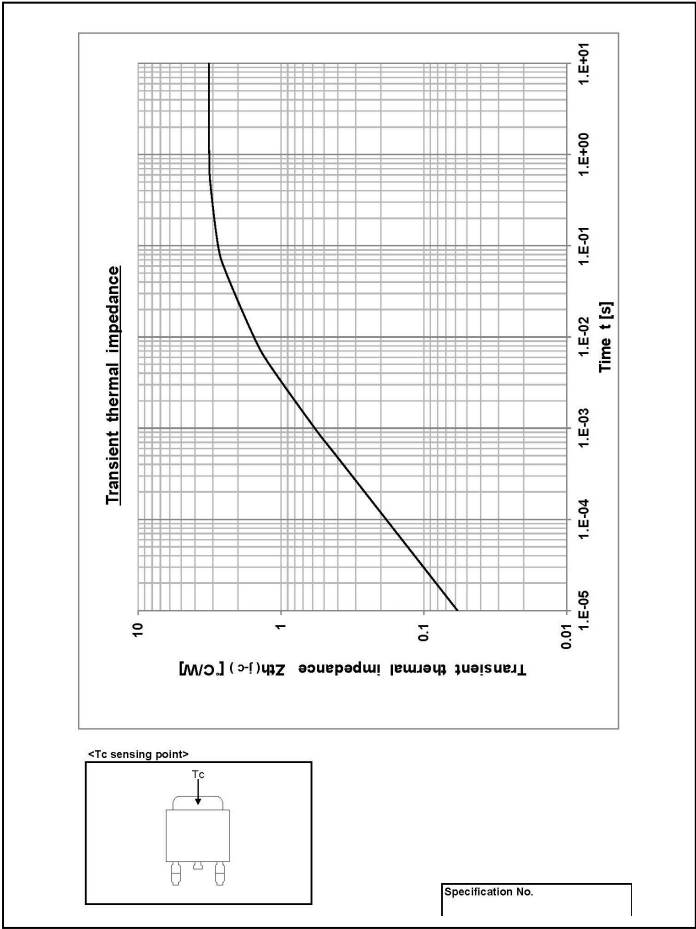
**Source current
vs source-drain diode forward voltage**

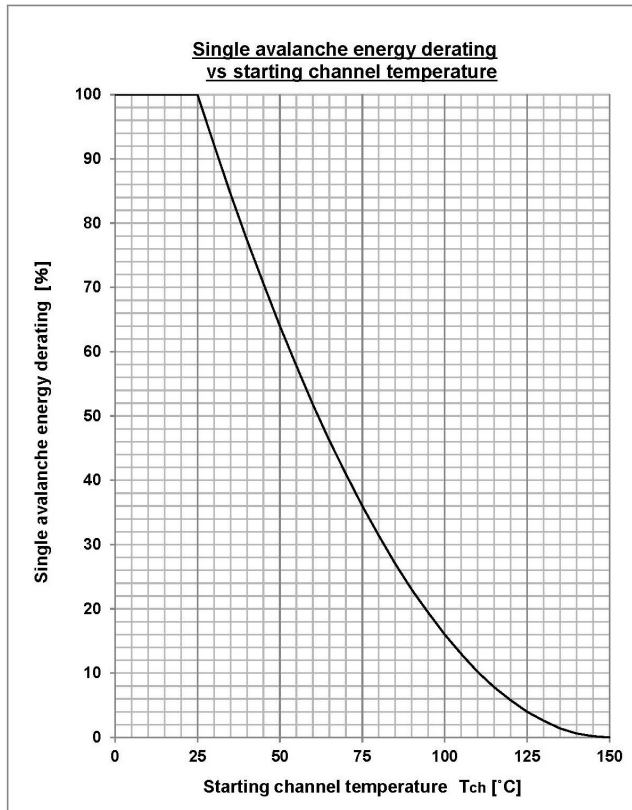
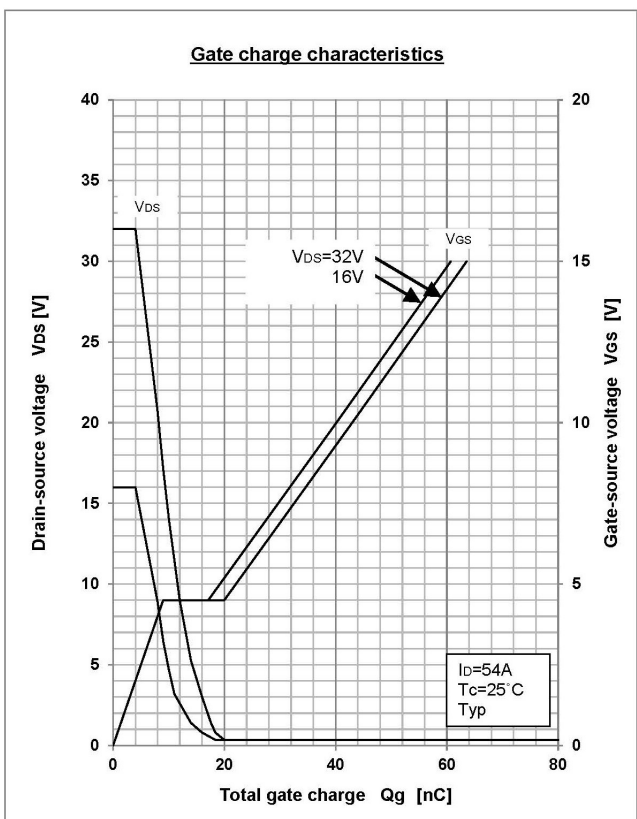
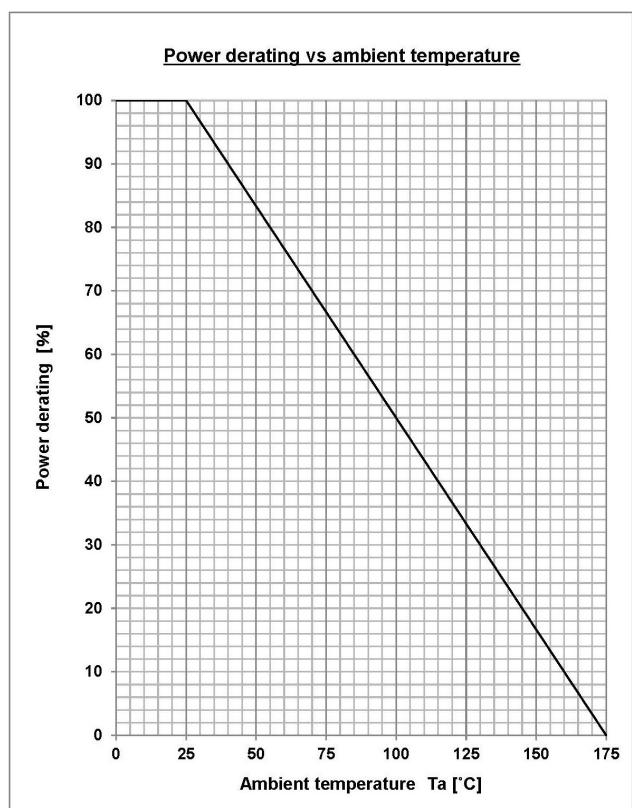
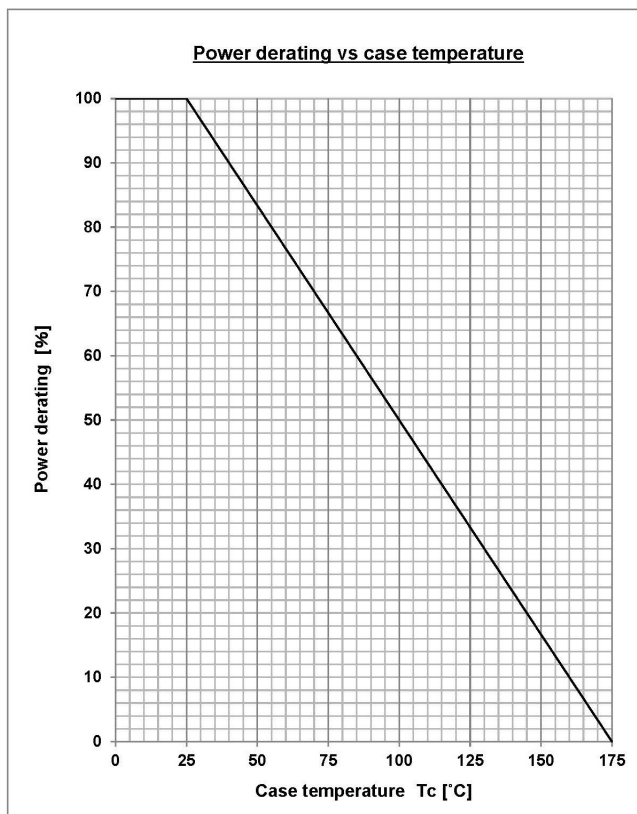


**Static drain-source on-state resistance
vs drain current**



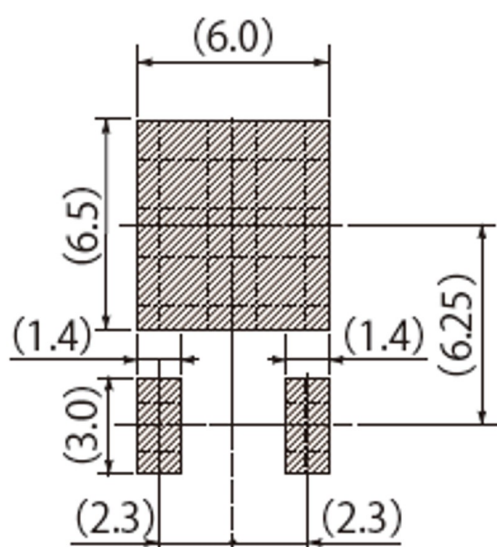
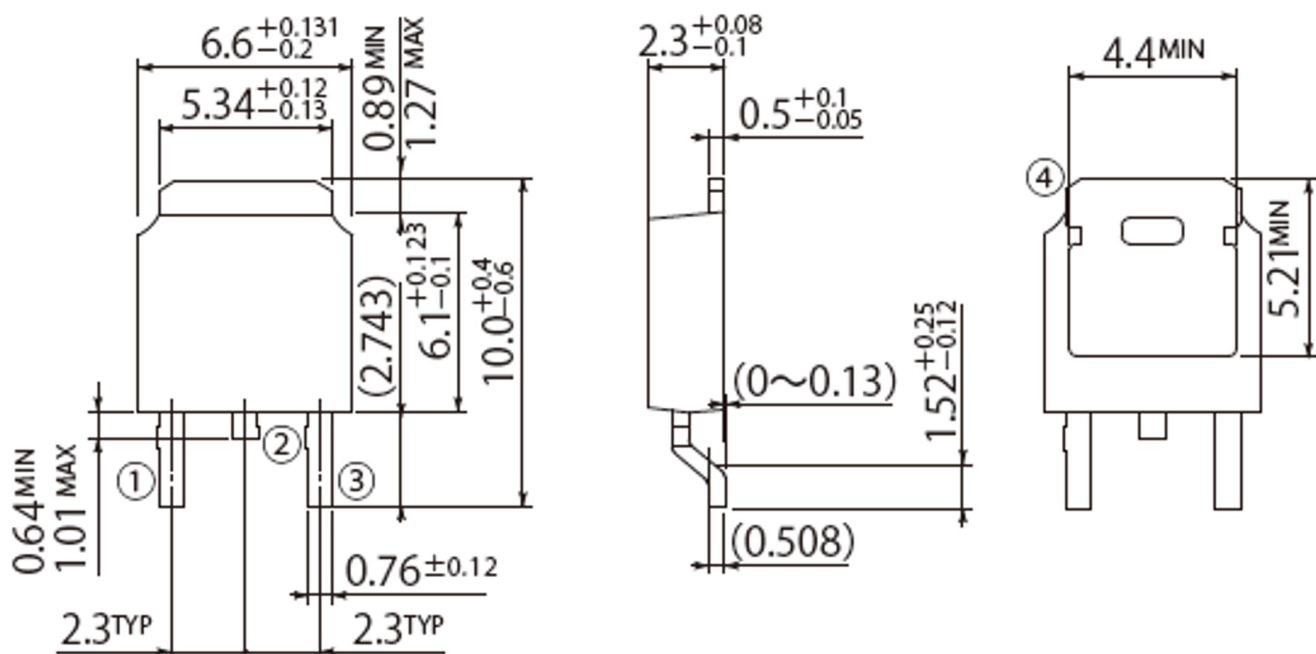






G2

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



Referential Soldering Pad

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