ShinDengen

P12FE7R5SBK

Power MOSFETs
75V, 12A, N-channel

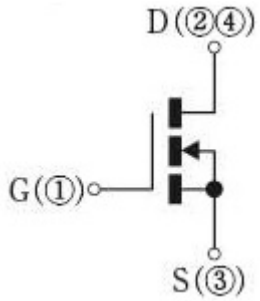
Feature

- N-channel
- SMD
- Low Ron
- 4.5V Gate Drive
- Low Capacitance
- Based on AEC-Q105
- Pb free terminal
- RoHS:Yes

OUTLINE

Package (House Name): FE
Package (JEDEC Code): TO-252AB similar
Package (JEITA Code): SC-63

Equivalent circuit



Absolute Maximum Ratings (unless otherwise specified : Tc=25℃)

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 175	℃
Channel tempertature	Tch		-55 to 175	℃
Drain-source voltage	V_{DSS}		75	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current(DC)	I_D		12	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	36	A
Total power dissipation	P_T		24	W
Single avalanche current	I_{AS}	Starting Tch=25℃ Tch≦150℃	12	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	7.2	mJ

※ :See the original Specifications

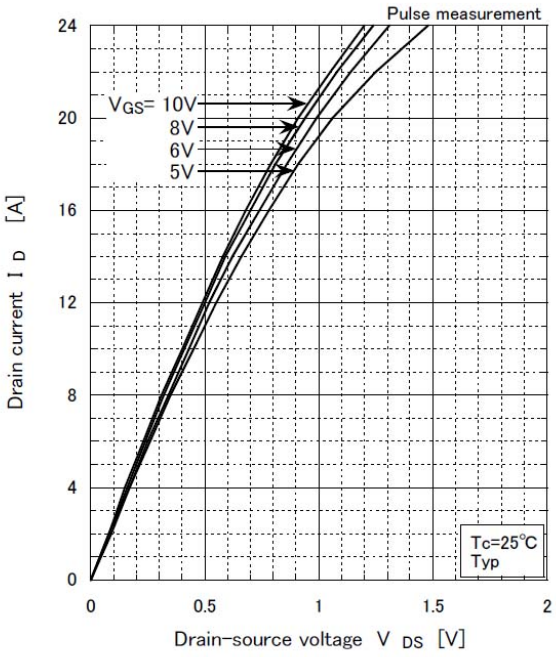
Electrical Characteristics (unless otherwise specified : Tc=25℃)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	75			V
Zero gate voltage drain current	I_{DSS}	VDS=75V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±10	μA
Forward transconductance	g_{fs}	ID=6A, VDS=10V	5			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=6A, VGS=10V		0.04	0.05	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=6A, VGS=4.5V		0.047	0.063	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	1.5	2	2.5	V
Source-drain diode forward voltage	V_{SD}	IS=12A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink ※			6.2	℃/W
Total gate charge	Qg	VDD=60V, VGS=10V, ID=12A		16.6		nC
Gate to source charge	Qgs	VDD=60V, VGS=10V, ID=12A		4.2		nC
Gate to drain charge	Qgd	VDD=60V, VGS=10V, ID=12A		3.9		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		660		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		32		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		77		pF
Turn-on delay time	td(on)	ID=6A, RL=6.25Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		4.5		ns
Rise time	tr	ID=6A, RL=6.25Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		7		ns
Turn-off delay time	td(off)	ID=6A, RL=6.25Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		14		ns
Fall time	tf	ID=6A, RL=6.25Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		4		ns
Diode reverse recovery time	trr	IF=12A, VGS=0V, di/dt=100A/μs		44		ns
Diode reverse recovery charge	Qrr	IF=12A, VGS=0V, di/dt=100A/μs		54		nC

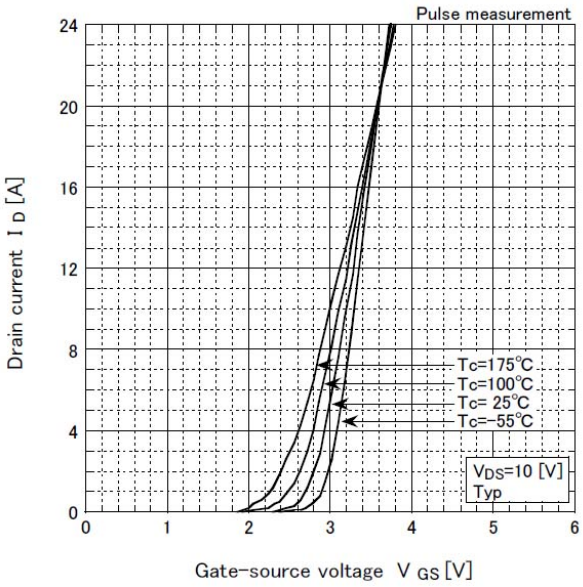
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

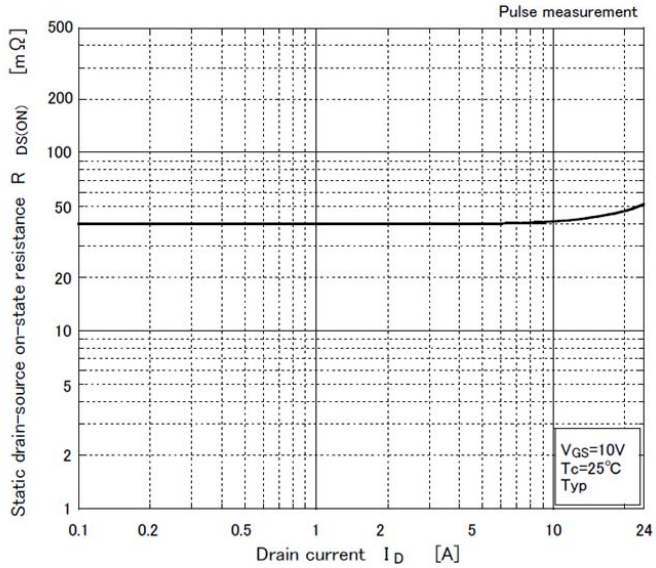
Typical output characteristics



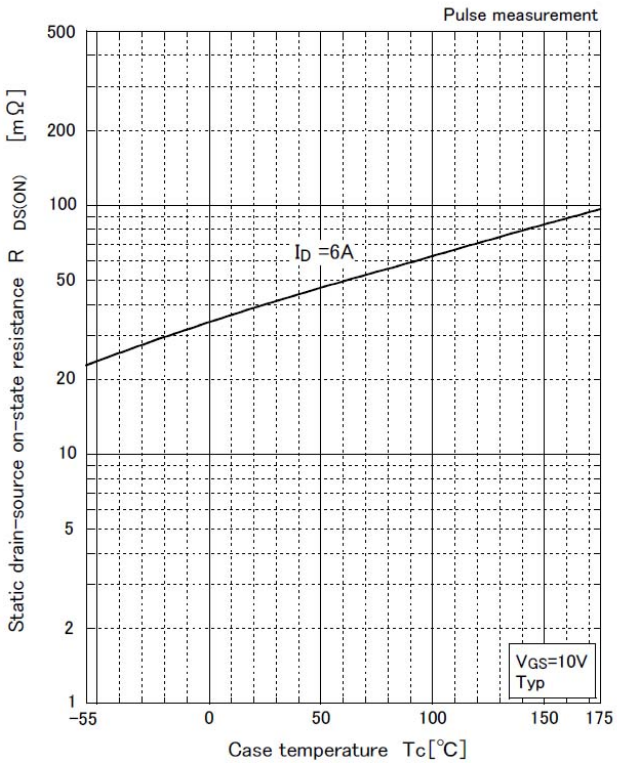
Transfer characteristics



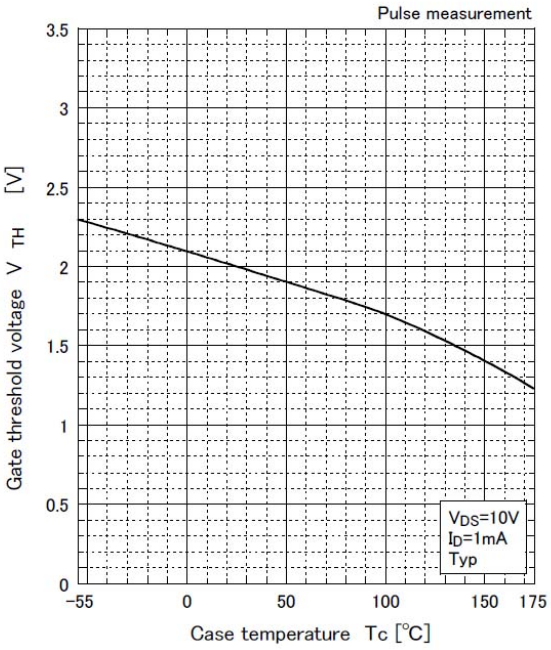
Static drain-source on-state resistance
vs drain current



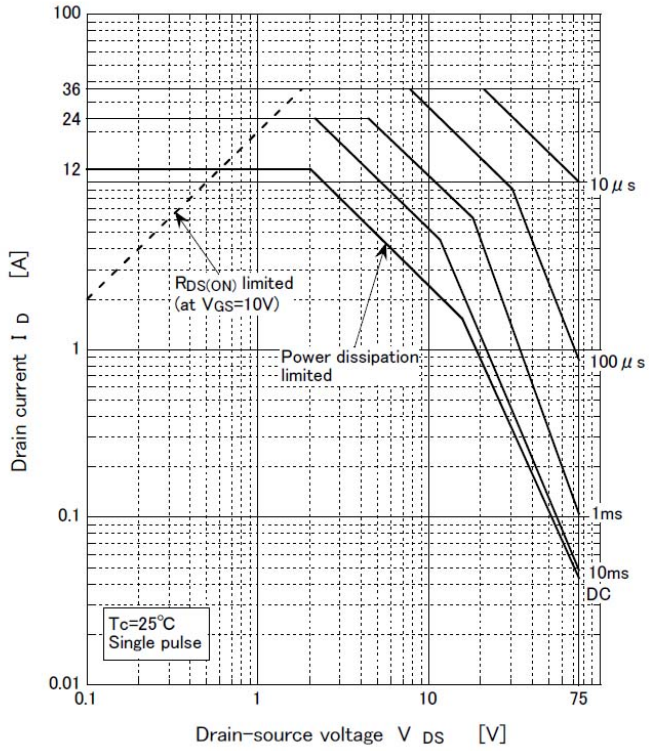
Static drain-source on-state resistance
vs case temperature

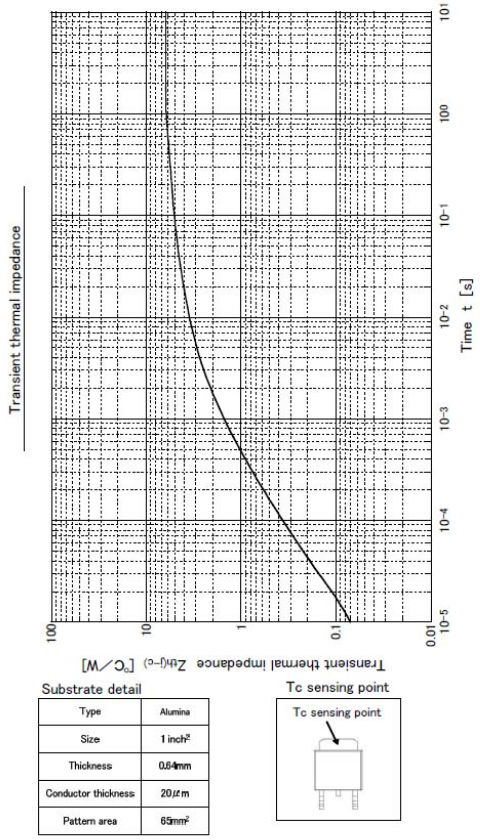


Gate threshold voltage
vs case temperature



Safe operating area

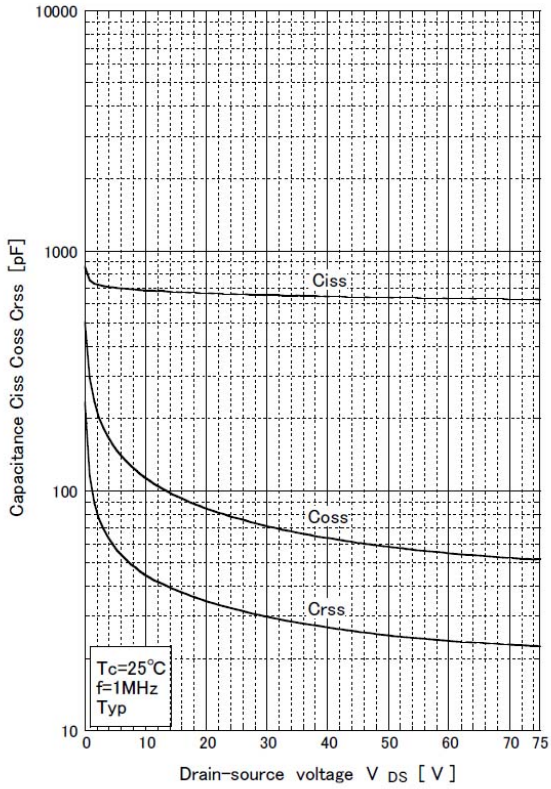




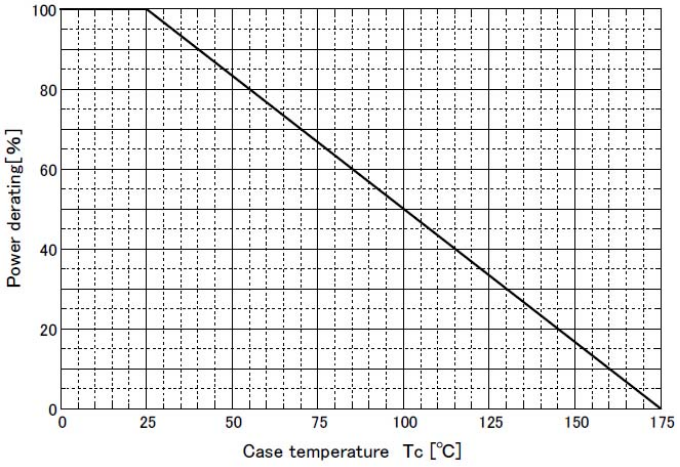
Substrate detail

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

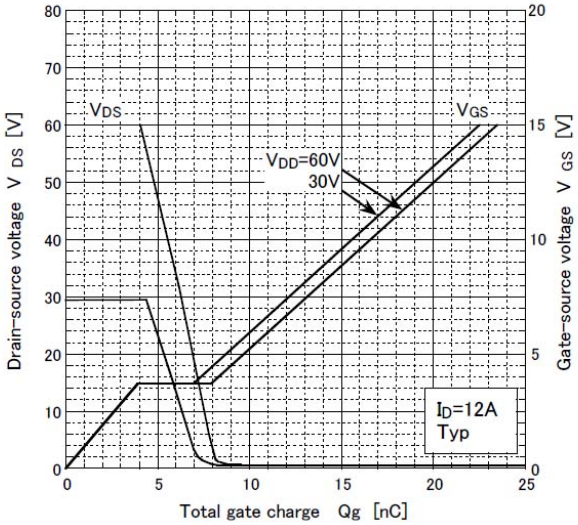
Capacitance characteristics



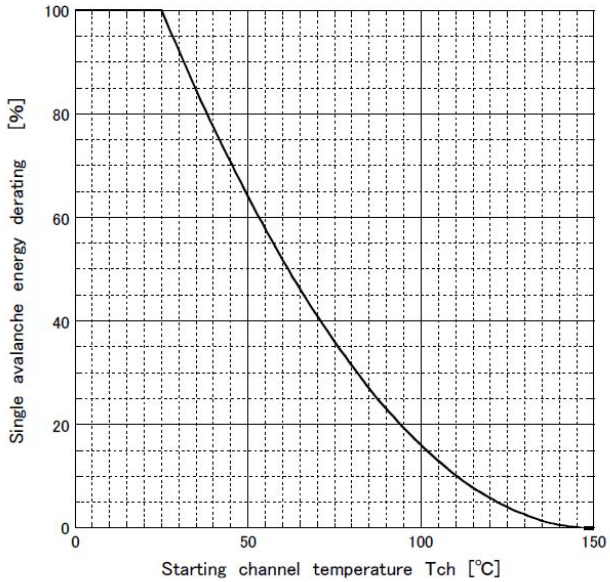
Power derating – case temperature



Gate charge characteristics



Single avalanche energy derating
vs channel temperature



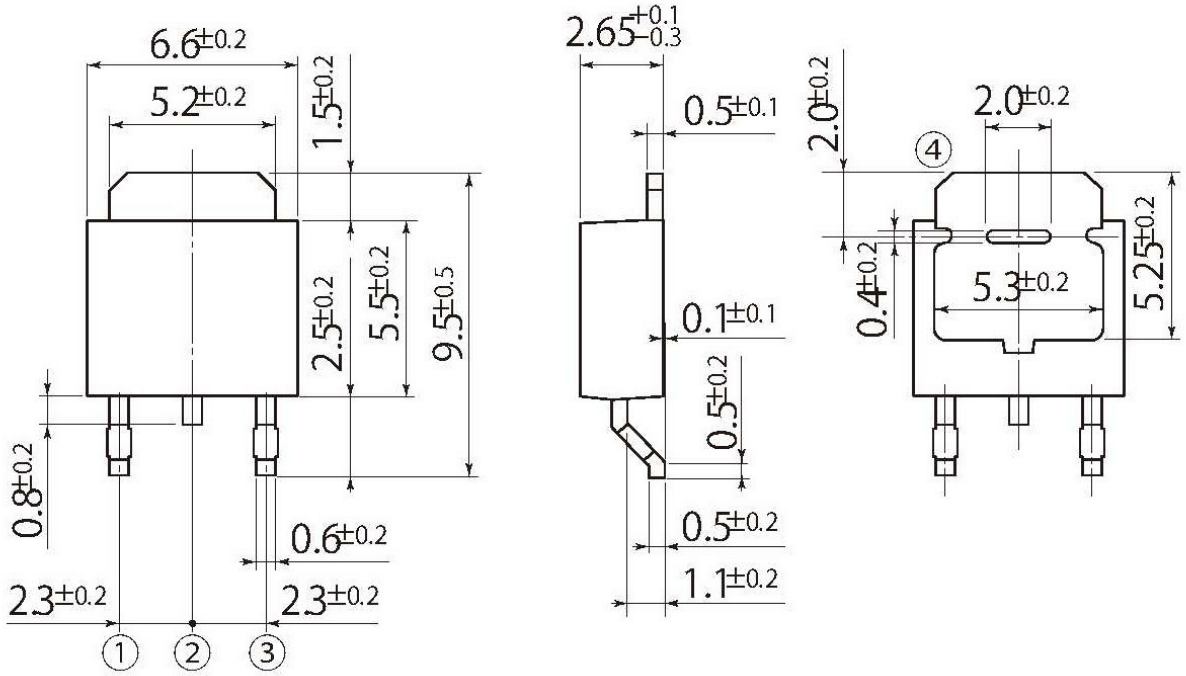
Outline Dimensions

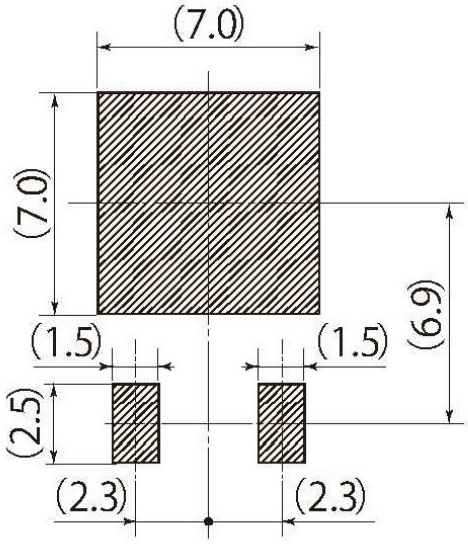
unit:mm

scale: 4/1

G3

JEDEC Code	TO-252AB similar
JEITA Code	SC-63
House Name	FE





Referential Soldering Pad

• Optimize soldering pad to the board design and soldering condi tion.

Notes

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