P4F90VX3

Power MOSFETs
900V, 4A, N-channel

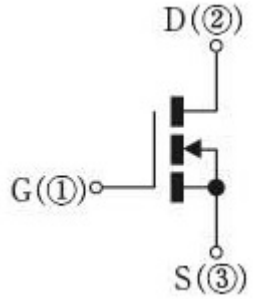
Feature

- N-channel
- High Voltage (900V)
- High ESD Capability
- Low Capacitance
- High Avalanche Durability, High di/dt Durability
- Pb free terminal
- RoHS:Yes

OUTLINE

Package (House Name): FTO-220AG
Package (JEITA Code): SC-91

Equivalent circuit



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

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 150	℃
Channel tempertature	Tch		-55 to 150	℃
Drain-source voltage	V_{DSS}		900	V
Gate-source voltage	V_{GSS}		±30	V
Continuous drain current(DC)	I_D		4	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	12	A
Continuous source current(DC)	Is		4	A
Total power dissipation	P_T		79	W
Repetitive avalanche current	I_{AR}	Starting Tch=25℃ Tch≦150℃	4	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	50	mJ
Repetitive avalanche energy	E_{AR}	Starting Tch=25℃ Tch≦150℃	5	mJ
Drain-source diode di/dt strength	di/dt	Is=4A, Tc=25℃	350	A/μs
Dielectric strenght	Vdis	Terminals to case, AC1min	2	kV
Mounting torque	TOR	(Recommended torque：0.3N･m)	0.5	N･m

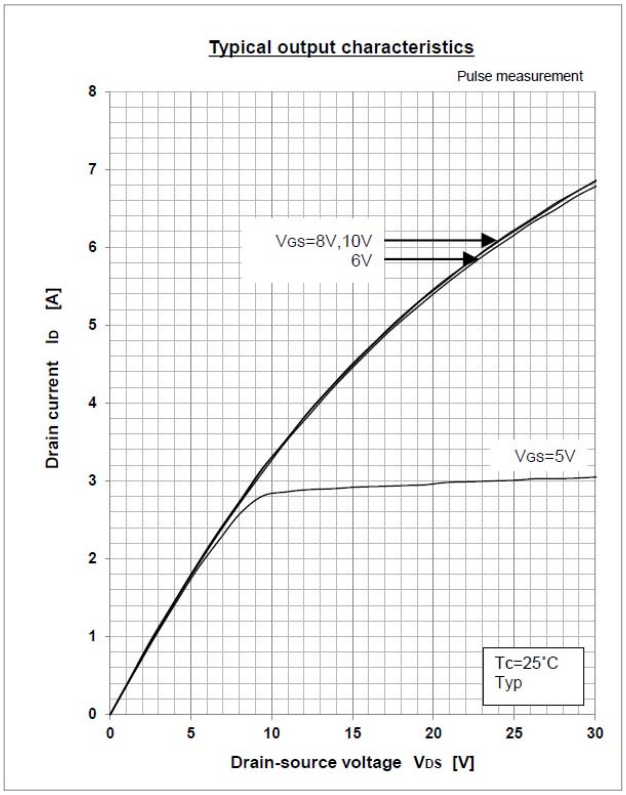
※ ：See the original Specifications

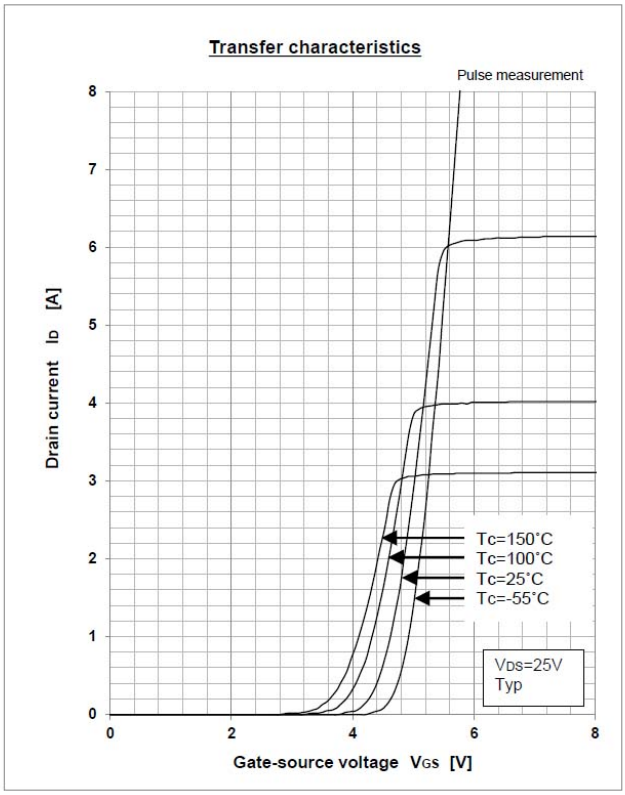
Electrical Characteristics (unless otherwise specified : Tc=25℃)

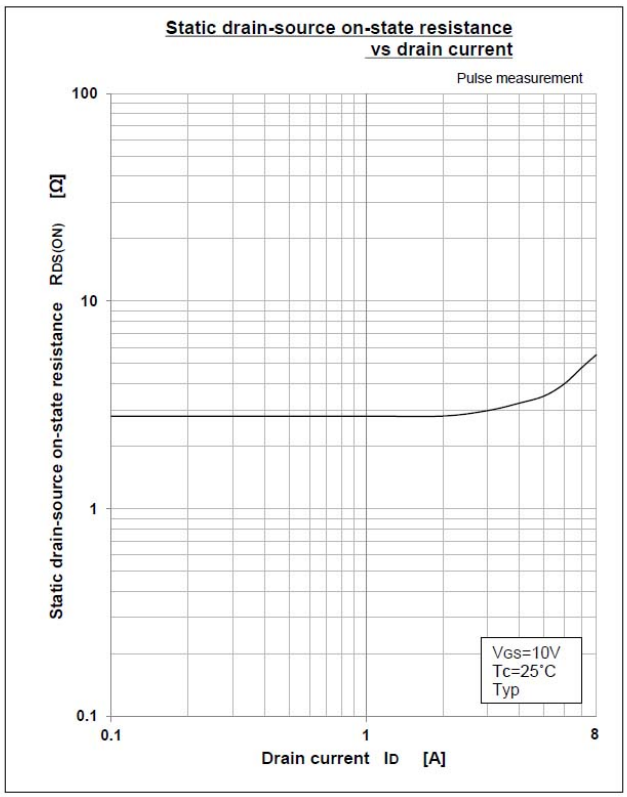
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	900			V
Zero gate voltage drain current	I_{DSS}	VDS=900V, VGS=0V			100	μA
Gate-source leakage current	I_{GSS}	VGS=±25V, VDS=0V			±10	μA
Forward transconductance	g_{fs}	ID=2.0A, VDS=10V	2.3	5.1		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=2.0A, VGS=10V		2.8	3.6	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	3		4	V
Source-drain diode forward voltage	V_{SD}	IS=2.0A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink			1.58	℃/W
Total gate charge	Qg	VDD=400V, VGS=10V, ID=4A		21		nC
Input capacitance	Ciss	VDS=50V, VGS=0V, f=1MHz		595		pF
Reverce transfer capacitnce	Crss	VDS=50V, VGS=0V, f=1MHz		5.5		pF
Output capacitance	Coss	VDS=50V, VGS=0V, f=1MHz		47		pF
Turn-on delay time	td(on)	ID=2.0A, RL=75Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		24		ns
Rise time	tr	ID=2.0A, RL=75Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		33		ns
Turn-off delay time	td(off)	ID=2.0A, RL=75Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		112		ns
Fall time	tf	ID=2.0A, RL=75Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		44		ns

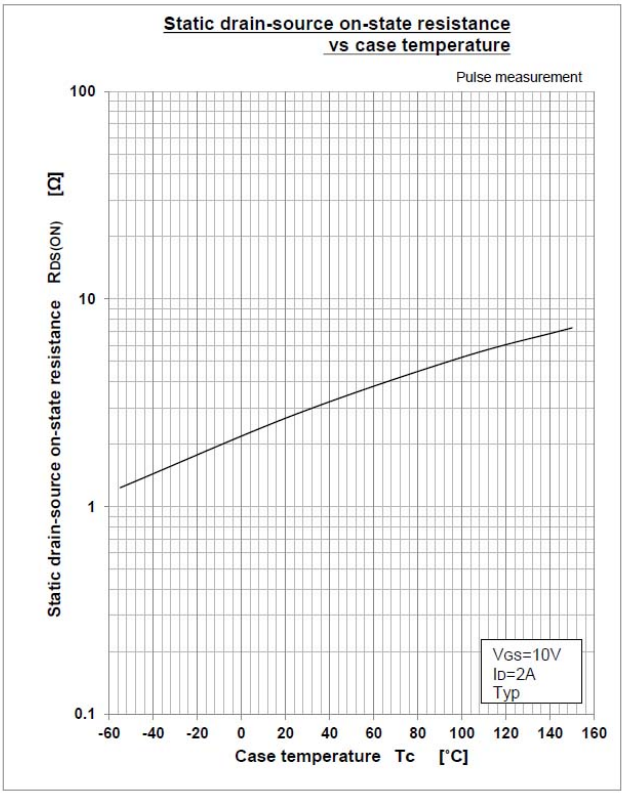
※ ：See the original Specifications

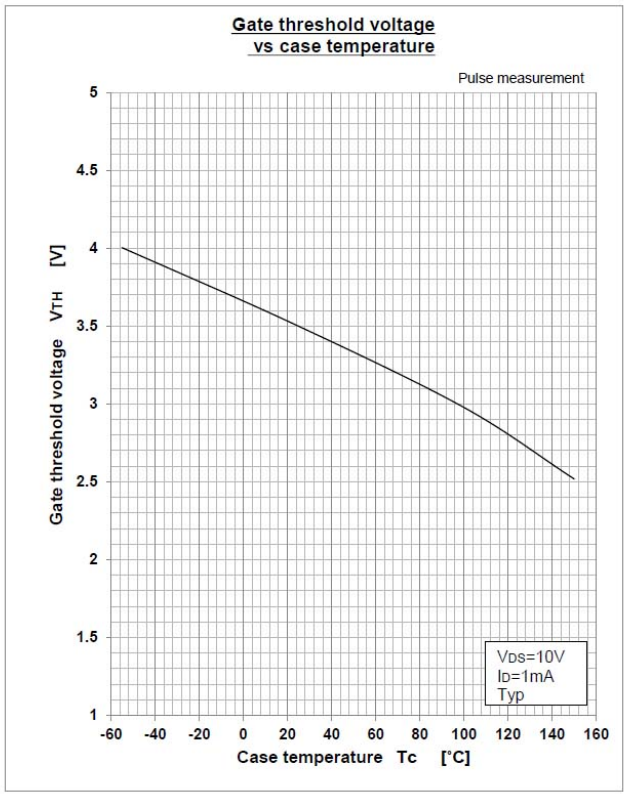
CHARACTERISTIC DIAGRAMS

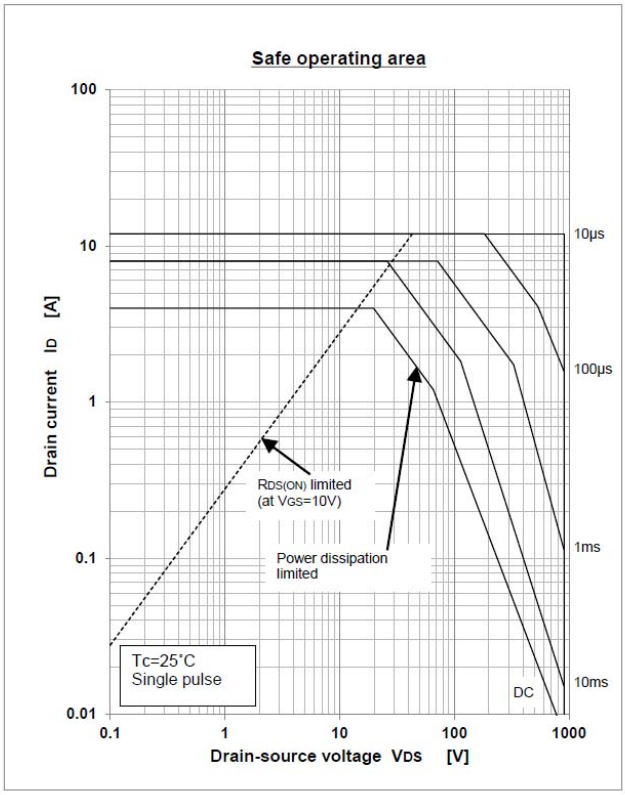


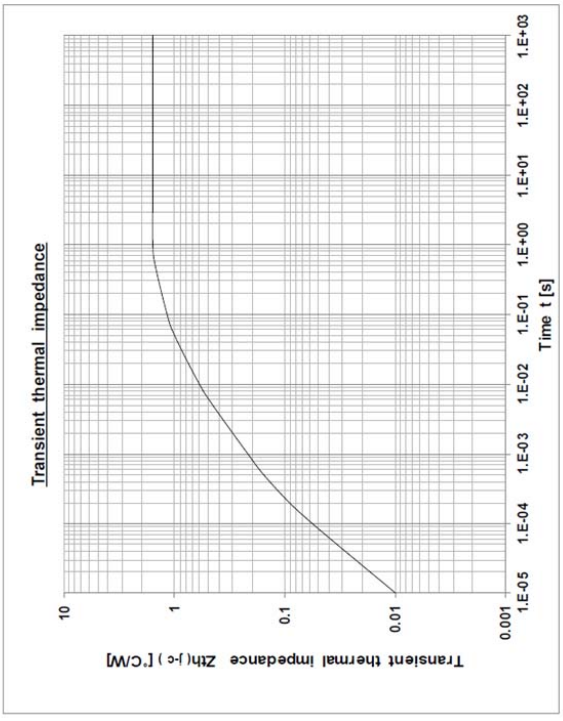


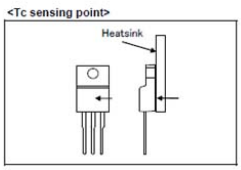


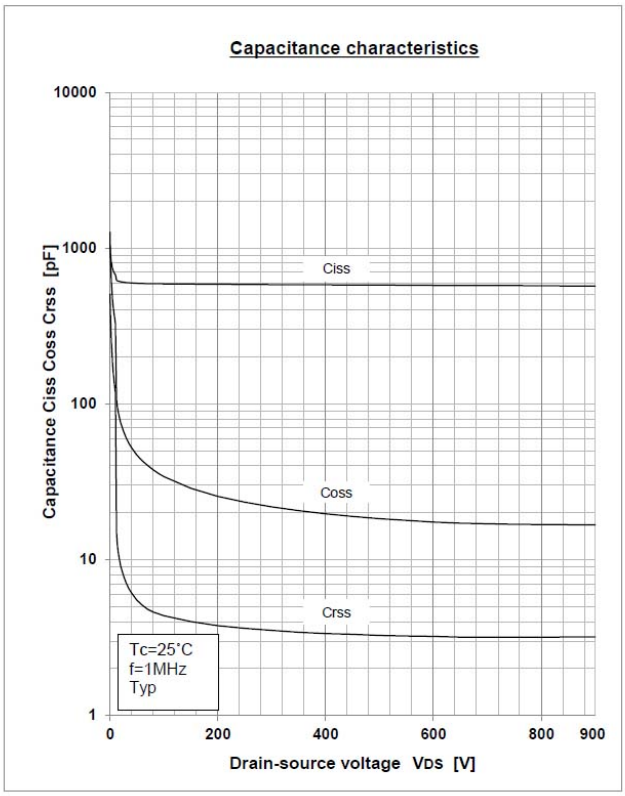


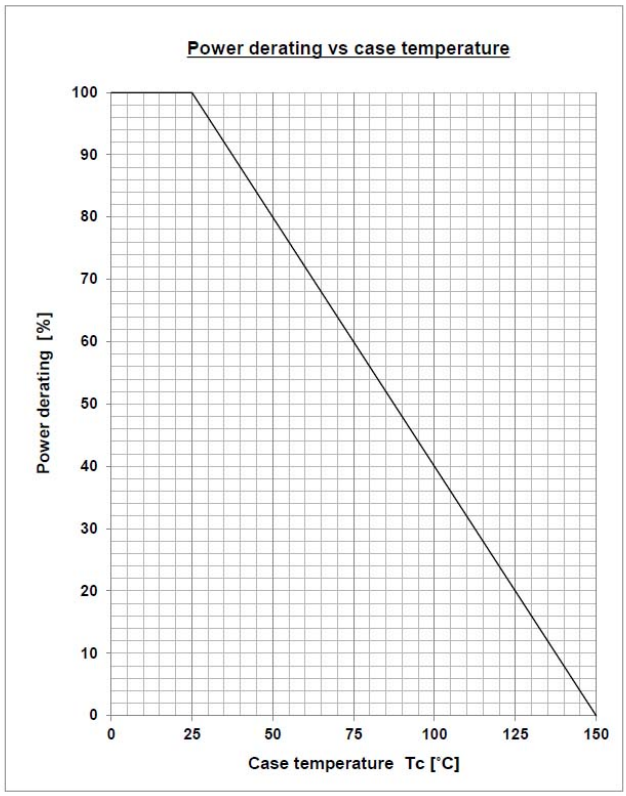

Gate threshold voltage
vs case temperature
Pulse measurement
Gate threshold voltage VTH [V]
Case temperature Tc [°C]
VDS=10V
ID=1mA
Typ

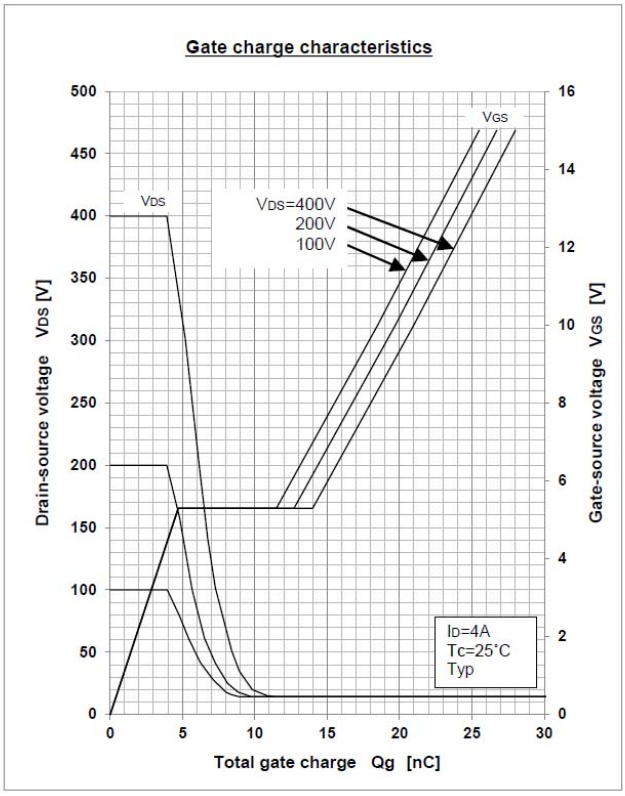

Safe operating area
Drain current ID [A]
Drain-source voltage VDS [V]
RDS(ON) limited
(at VGS=10V)
Power dissipation
limited
Tc=25°C
Single pulse
10μs
100μs
1ms
10ms
DC

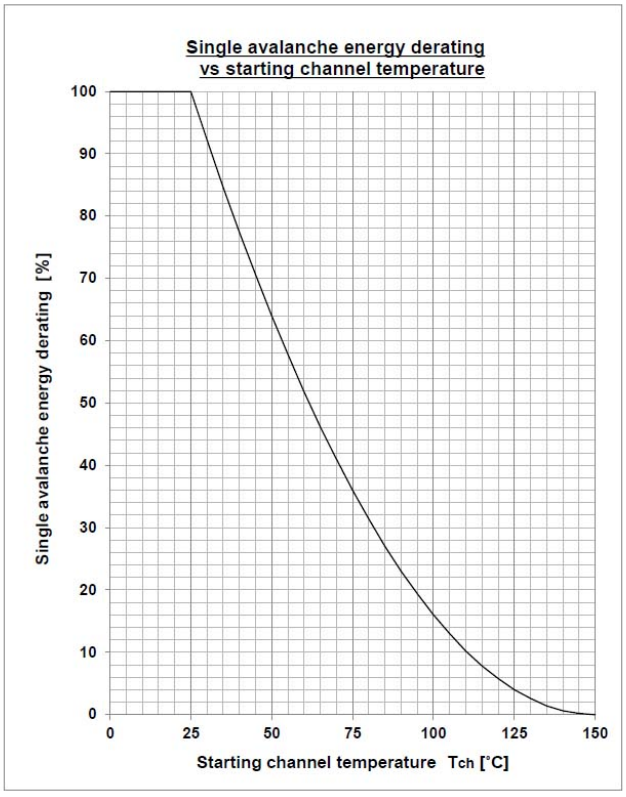

Transient thermal impedance
Time t [s]
Transient thermal impedance Zth(j-c) [°C/W]

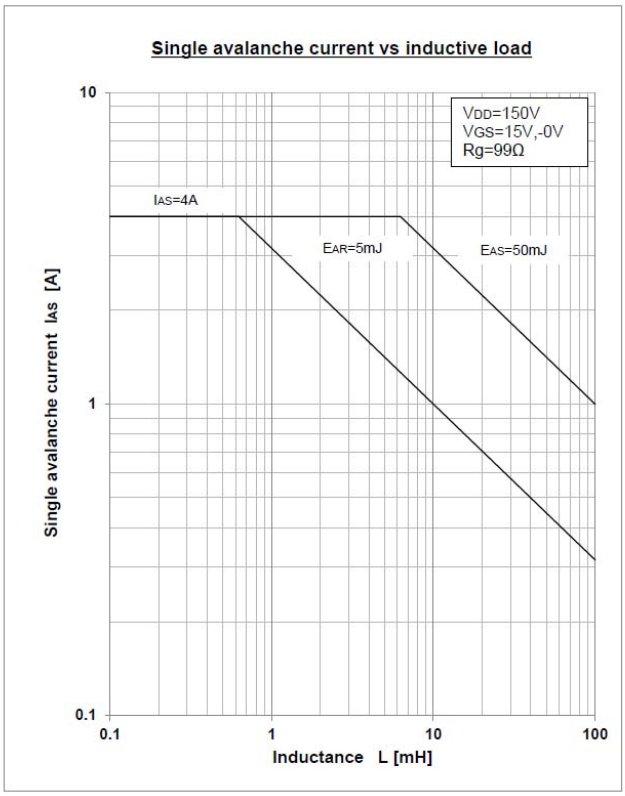

<Tc sensing point>
Heatsink


Capacitance characteristics
Capacitance Ciss Coss Crss [pF]
Drain-source voltage VDS [V]
Ciss
Coss
Crss
Tc=25°C
f=1MHz
Typ


Power derating vs case temperature
Power derating [%]
Case temperature Tc [°C]
100
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150


Gate charge characteristics
Drain-source voltage VDS [V]
Gate-source voltage VGS [V]
Total gate charge Qg [nC]
VDS
VGS
VDS=400V
200V
100V
ID=4A
Tc=25°C
Typ
500
450
400
350
300
250
200
150
100
50
0
16
14
12
10
8
6
4
2
0
0
5
10
15
20
25
30


Single avalanche energy derating
vs starting channel temperature
Single avalanche energy derating [%]
Starting channel temperature Tch [°C]
100
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150

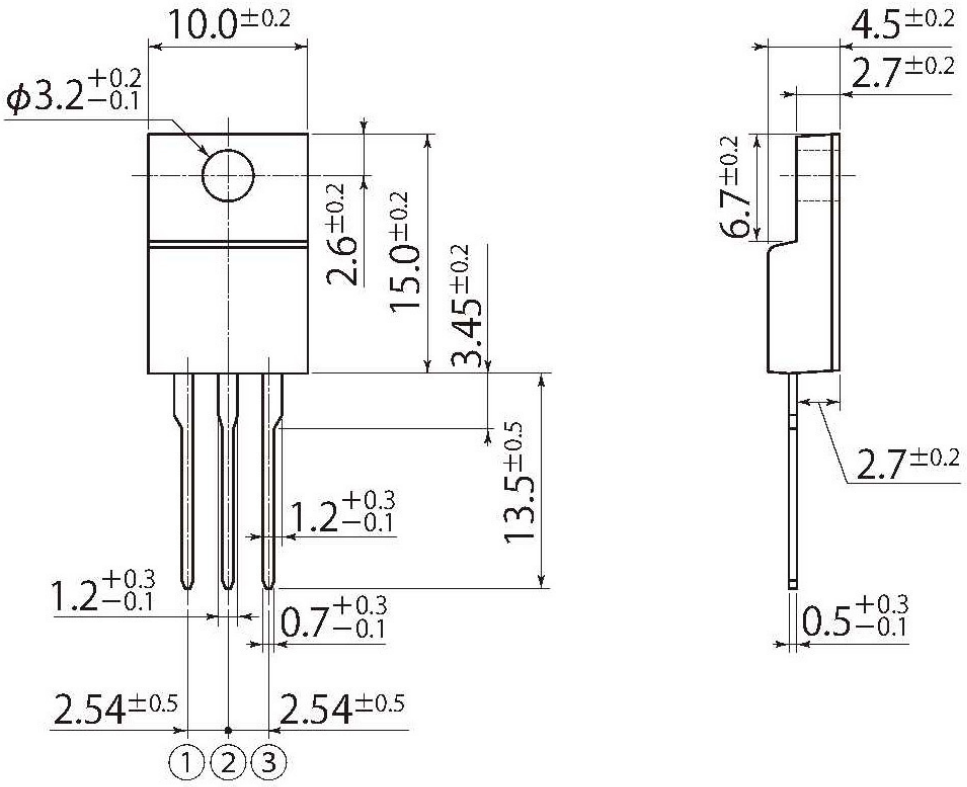

Single avalanche current vs inductive load
Single avalanche current IAS [A]
Inductance L [mH]
VDD=150V
VGS=15V,-0V
Rg=99Ω
IAS=4A
EAR=5mJ
EAS=50mJ
10
1
0.1
0.1
1
10
100

Outline Dimensions

unit:mm

J8

JEDEC Code	–
JEITA Code	SC-91
House Name	FTO-220AG(3pin)



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