ShinDengen

P42F6EN

Power MOSFETs
60V, 42A, N-channel

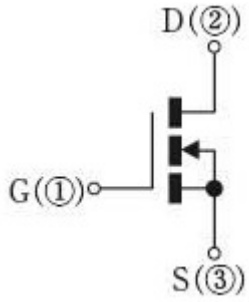
Feature

- N-channel
- Isolated Package
- Low Ron
- 10V Gate Drive
- Low Capacitance
- 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°C)

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 150	°C
Channel tempertature	Tch		150	°C
Drain-source voltage	V_{DSS}		60	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current(DC)	I_D		42	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	168	A
Total power dissipation	P_T		40	W
Single avalanche current	I_{AS}	Starting Tch=25°C Tch≦150°C	34	A
Single avalanche energy	E_{AS}	Starting Tch=25°C Tch≦150°C	60	mJ
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

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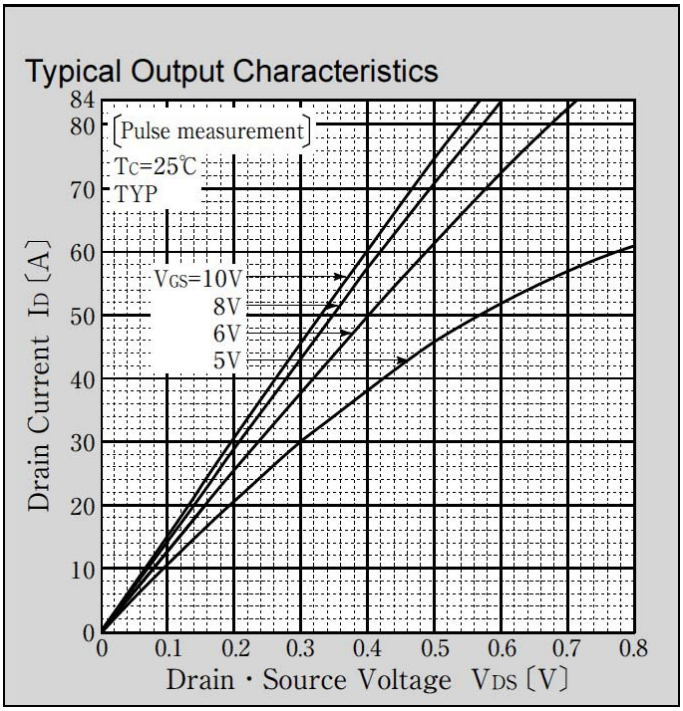
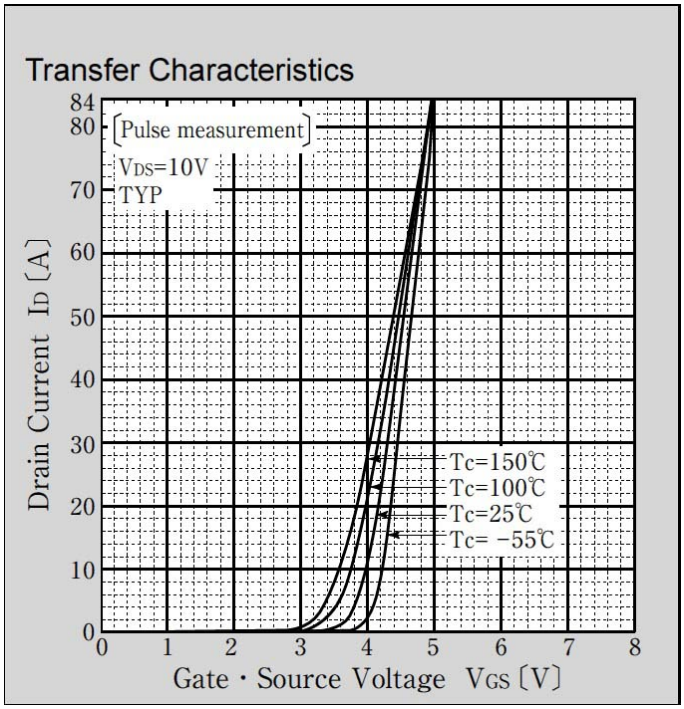
Electrical Characteristics (unless otherwise specified : Tc=25°C)

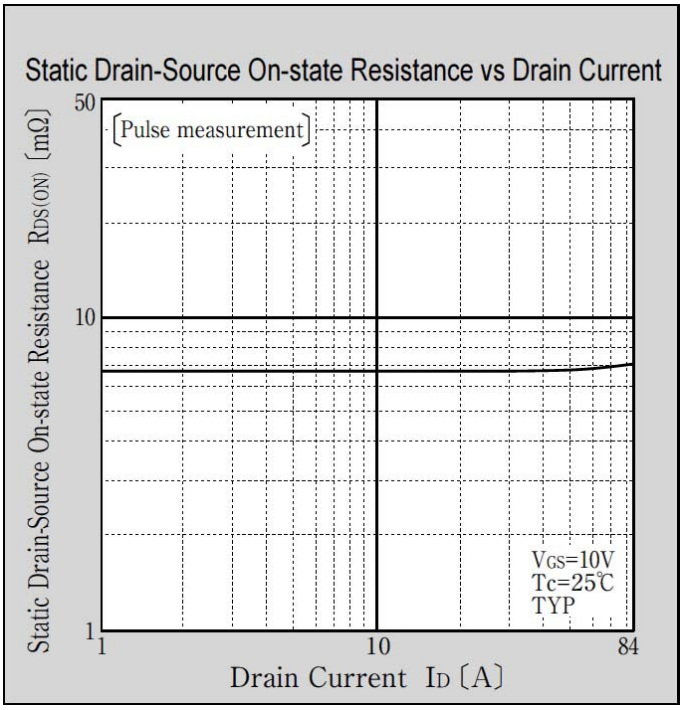
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	60			V
Zero gate voltage drain current	I_{DSS}	VDS=60V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=21A, VDS=10V	14			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=21A, VGS=10V		0.0067	0.0084	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	V_{SD}	IS=42A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case			3.12	°C/W
Total gate charge	Qg	VDD=48V, VGS=10V, ID=42A		47		nC
Gate to source charge	Qgs	VDD=48V, VGS=10V, ID=42A		12		nC
Gate to drain charge	Qgd	VDD=48V, VGS=10V, ID=42A		16		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		2540		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		170		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		350		pF
Turn-on delay time	td(on)	ID=21A, RL=1.43Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		11		ns
Rise time	tr	ID=21A, RL=1.43Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		22		ns
Turn-off delay time	td(off)	ID=21A, RL=1.43Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		21		ns
Fall time	tf	ID=21A, RL=1.43Ω, VDD=30V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		4		ns
Diode reverse recovery time	trr	IF=42A, VGS=0V, di/dt=100A/μs		45		ns
Diode reverse recovery charge	Qrr	IF=42A, VGS=0V, di/dt=100A/μs		71		nC

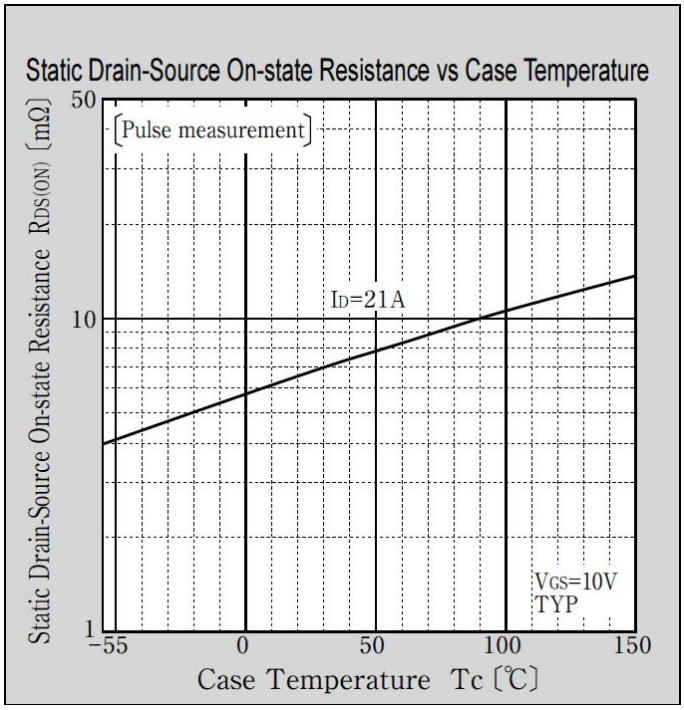
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

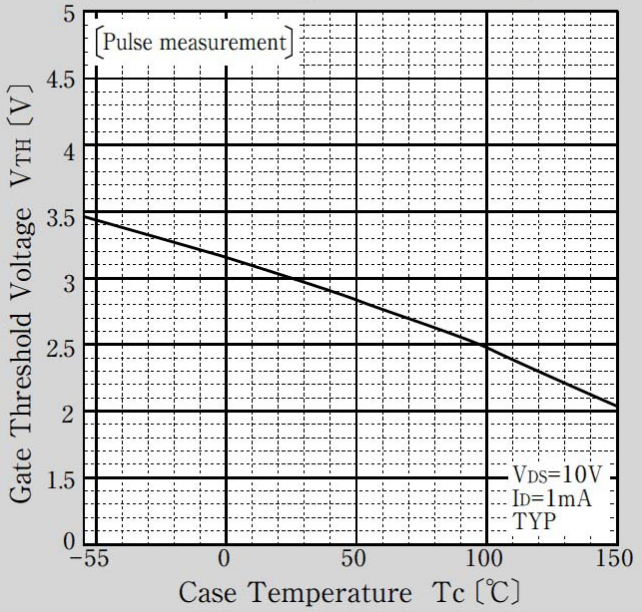




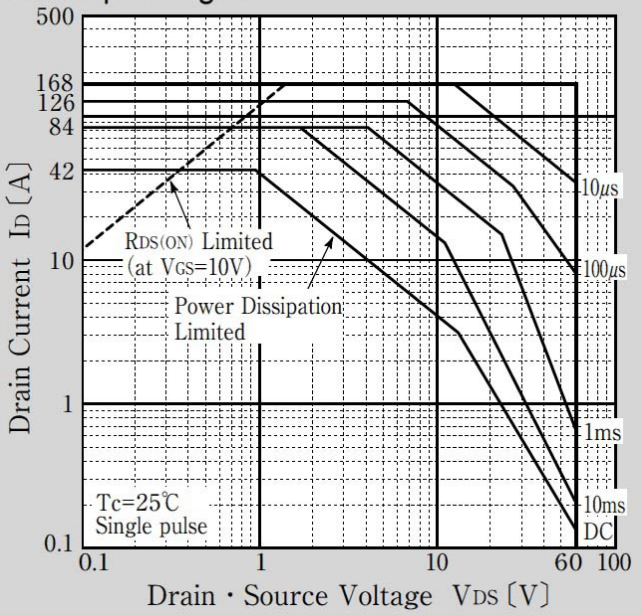




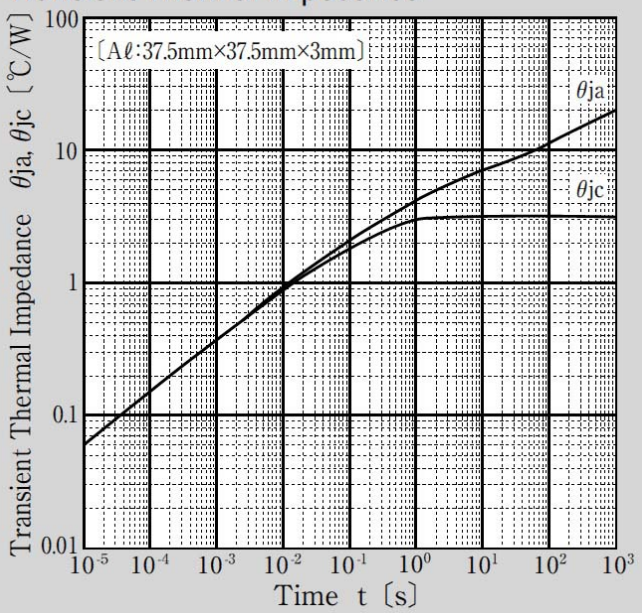
Gate Threshold Voltage vs Case Temperature



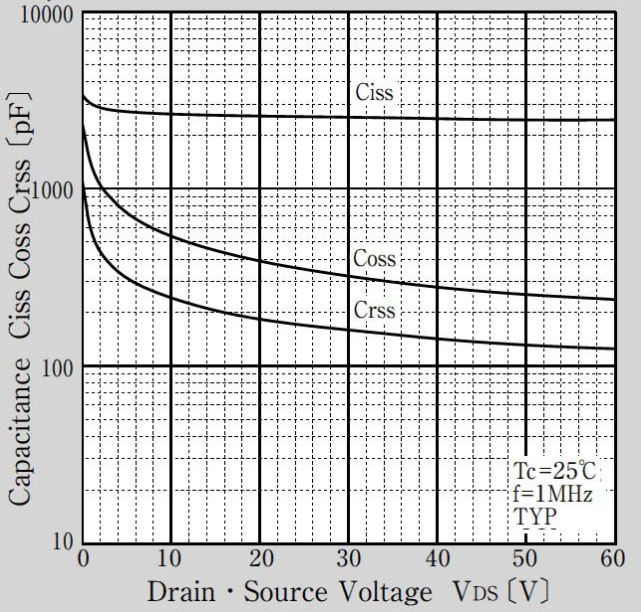
Safe Operating Area

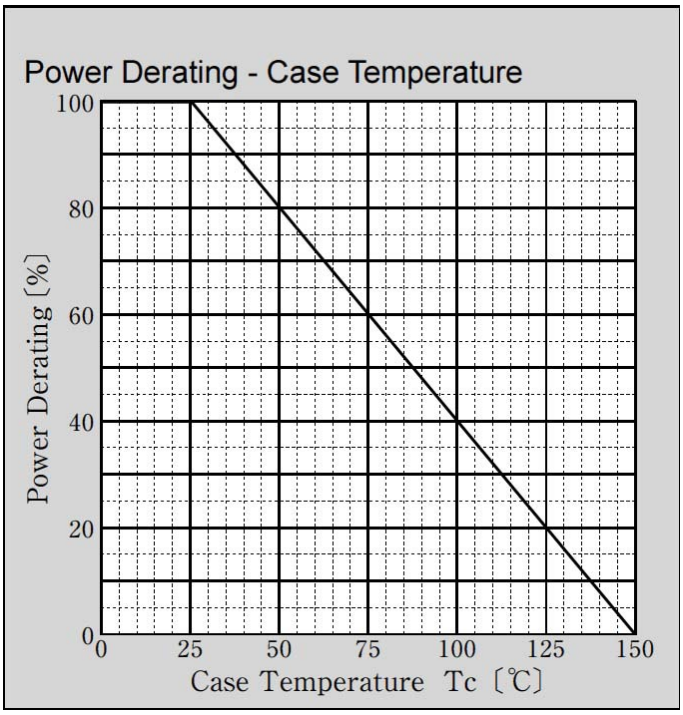


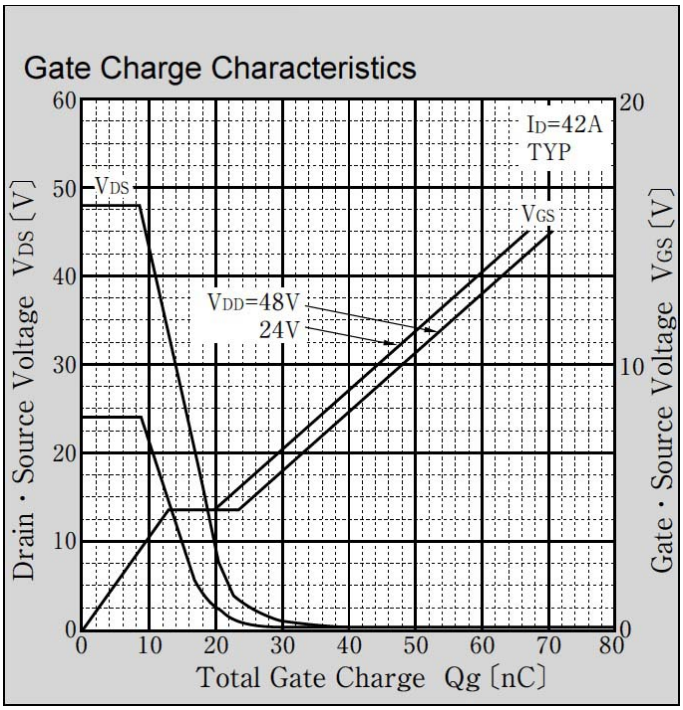
Transient Thermal Impedance

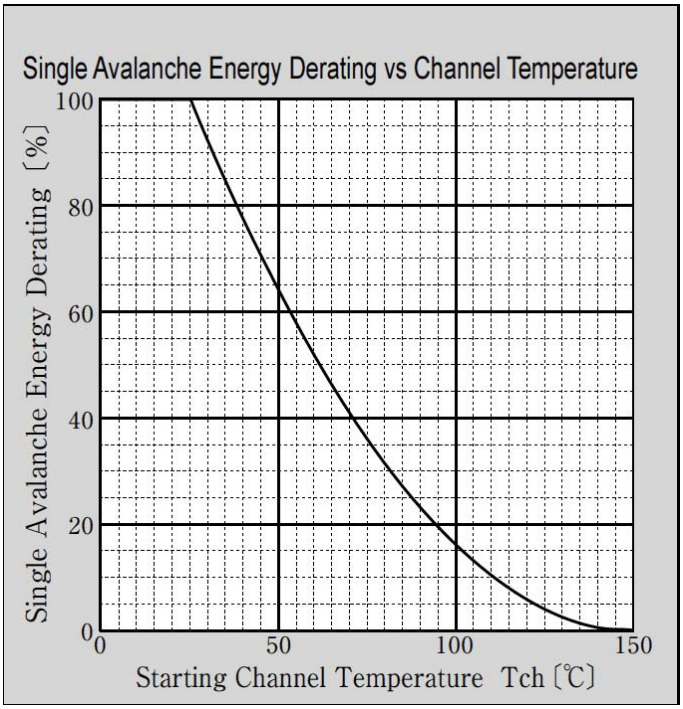


Capacitance Characteristics




Power Derating - Case Temperature
Power Derating〔%〕
Case Temperature Tc〔℃〕
0
20
40
60
80
100
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〕
ID=42A
TYP
VDS
VGS
VDD=48V
24V
0
10
20
30
40
50
60
0
10
20
0
10
20
30
40
50
60
70
80


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

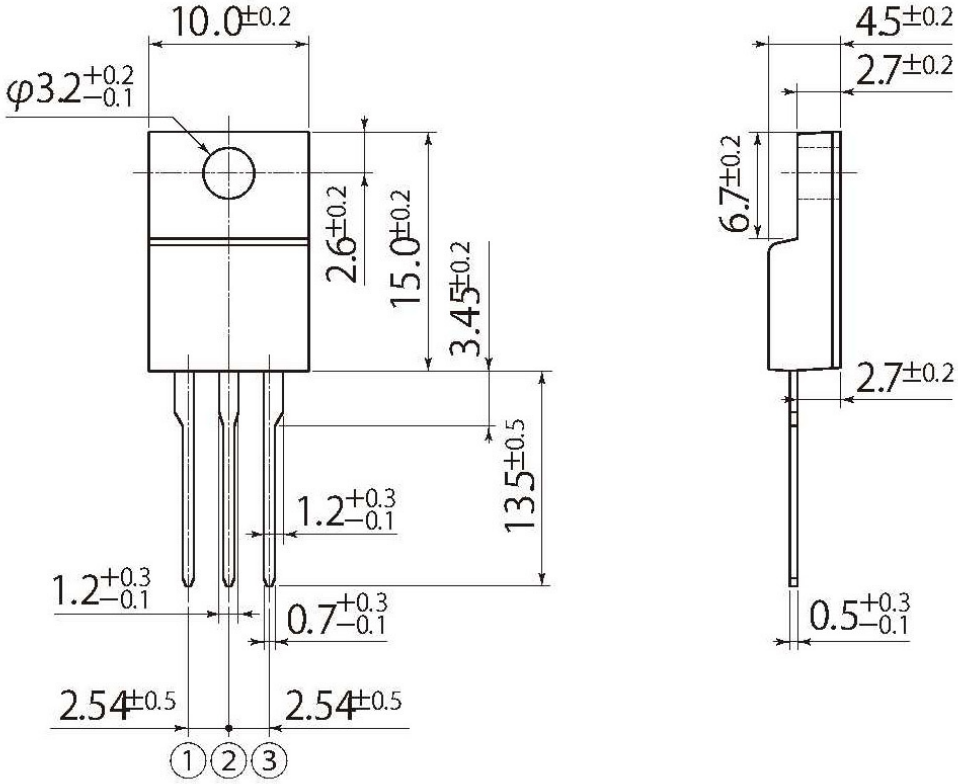
Outline Dimensions

unit:mm

scale: 2/1

J8

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



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