

P42F6EN

Power MOSFETs

60V, 42A, N-channel

Feature

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

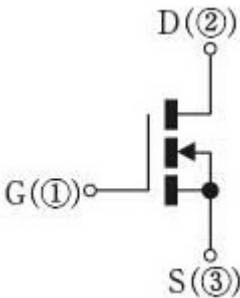
OUTLINE

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 temperrature	Tstg		-55 to 150	°C
Channel tempertature	Tch		150	°C
Drain-source voltage	V <sub>DSS</sub>		60	V
Gate-source voltage	V <sub>GSS</sub>		±20	V
Continuous drain current(DC)	I <sub>D</sub>		42	A
Continuous drain current(Peak)	I <sub>DP</sub>	Pulse width 10μs, duty=1/100	168	A
Total power dissipation	P <sub>T</sub>		40	W
Single avalanche current	I <sub>AS</sub>	Starting Tch=25°C Tch≤150°C	34	A
Single avalanche energy	E <sub>AS</sub>	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

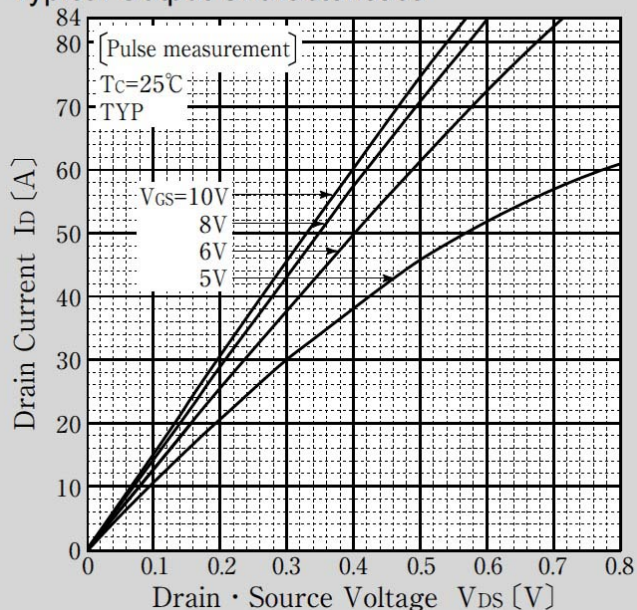
※ :See the original Specifications

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

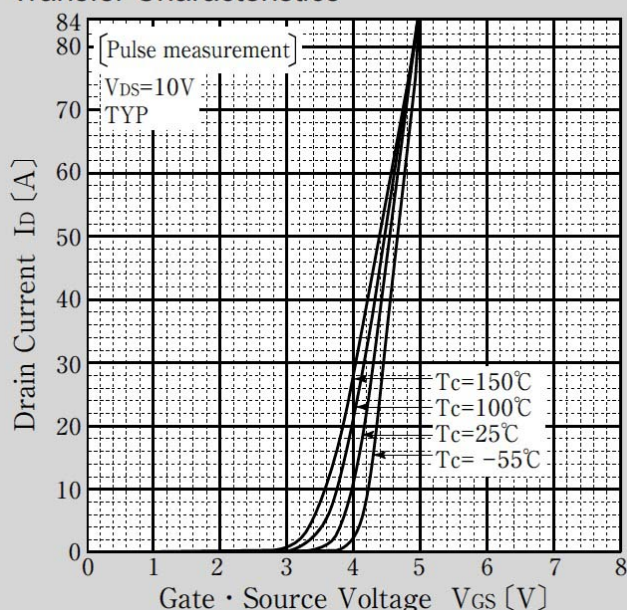
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	60			V
Zero gate voltage drain current	$I_{DSS}$	VDS=60V, VGS=0V			1	μA
Gate-source leakage current	$I_{GSS}$	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	$g_{fs}$	ID=21A, VDS=10V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

※ :See the original Specifications

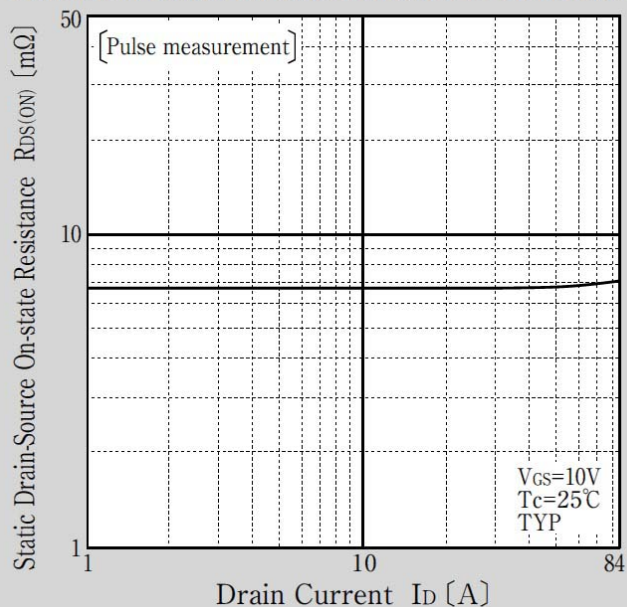
## Typical Output Characteristics



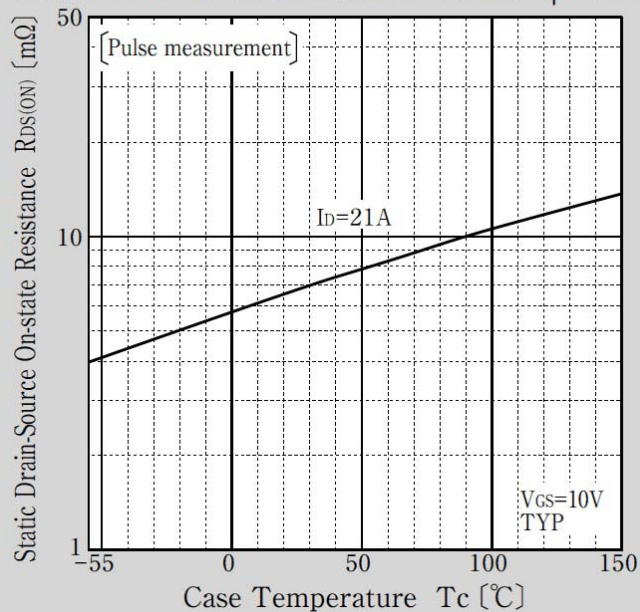
## Transfer Characteristics



## Static Drain-Source On-state Resistance vs Drain Current

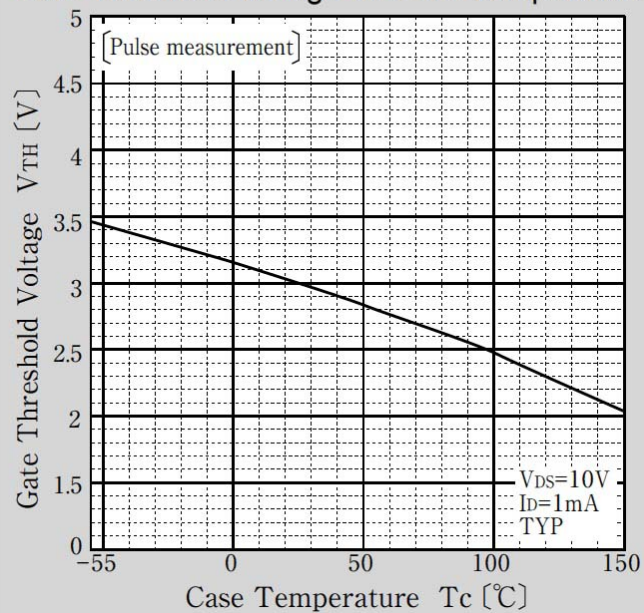


## Static Drain-Source On-state Resistance vs Case Temperature

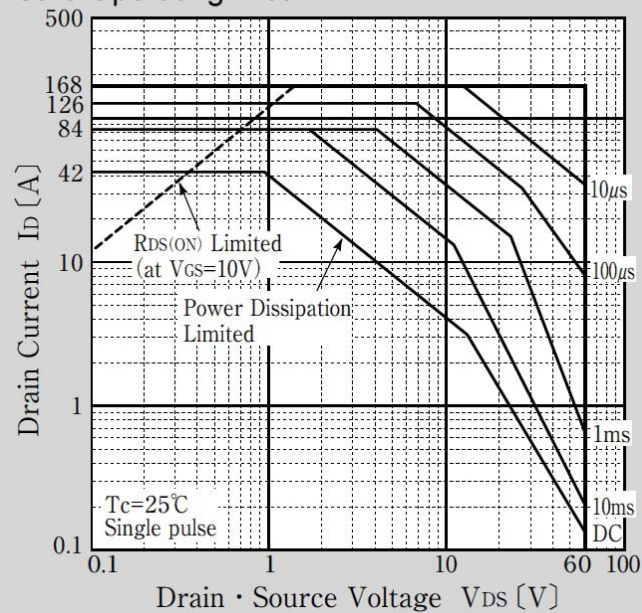




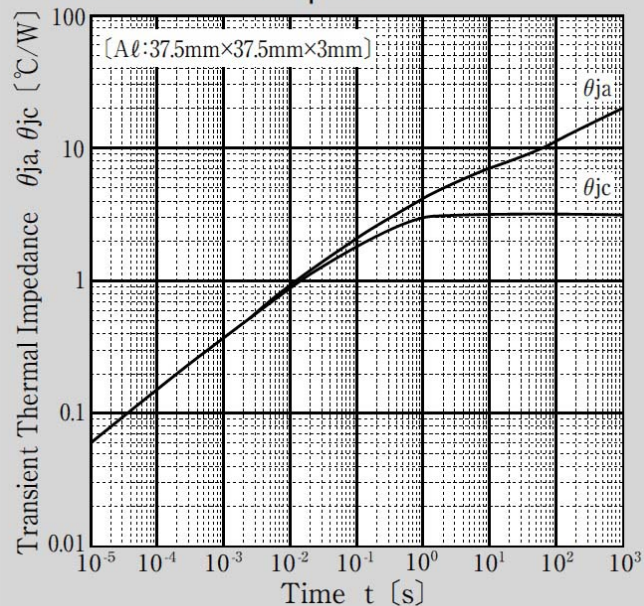
### Gate Threshold Voltage vs Case Temperature



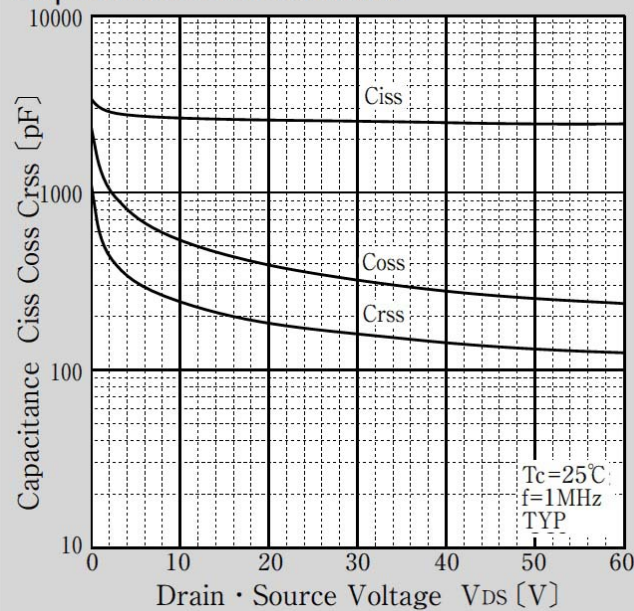
### Safe Operating Area



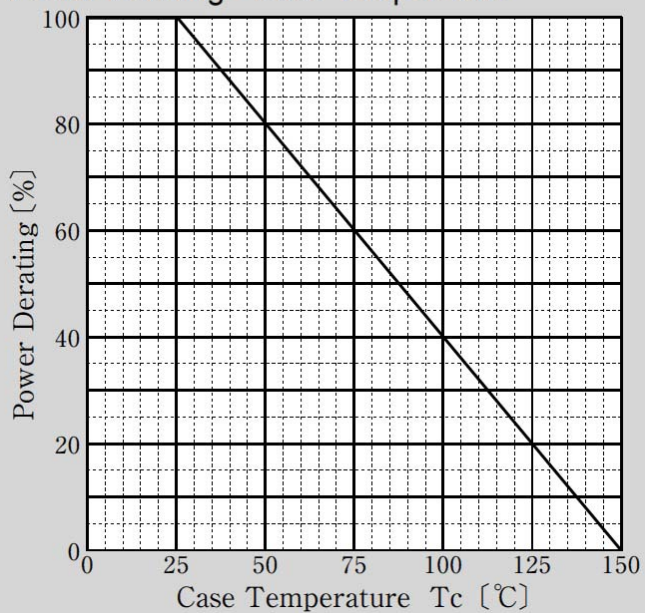
### Transient Thermal Impedance



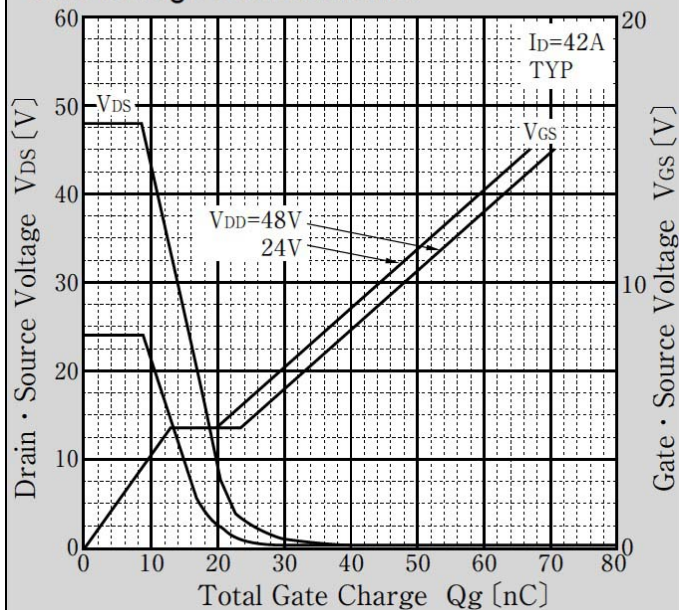
### Capacitance Characteristics



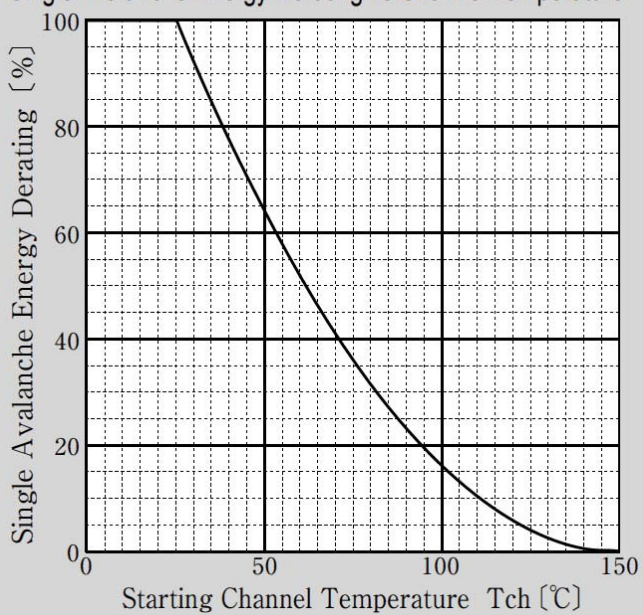
Power Derating - Case Temperature



Gate Charge Characteristics



Single Avalanche Energy Derating vs Channel Temperature

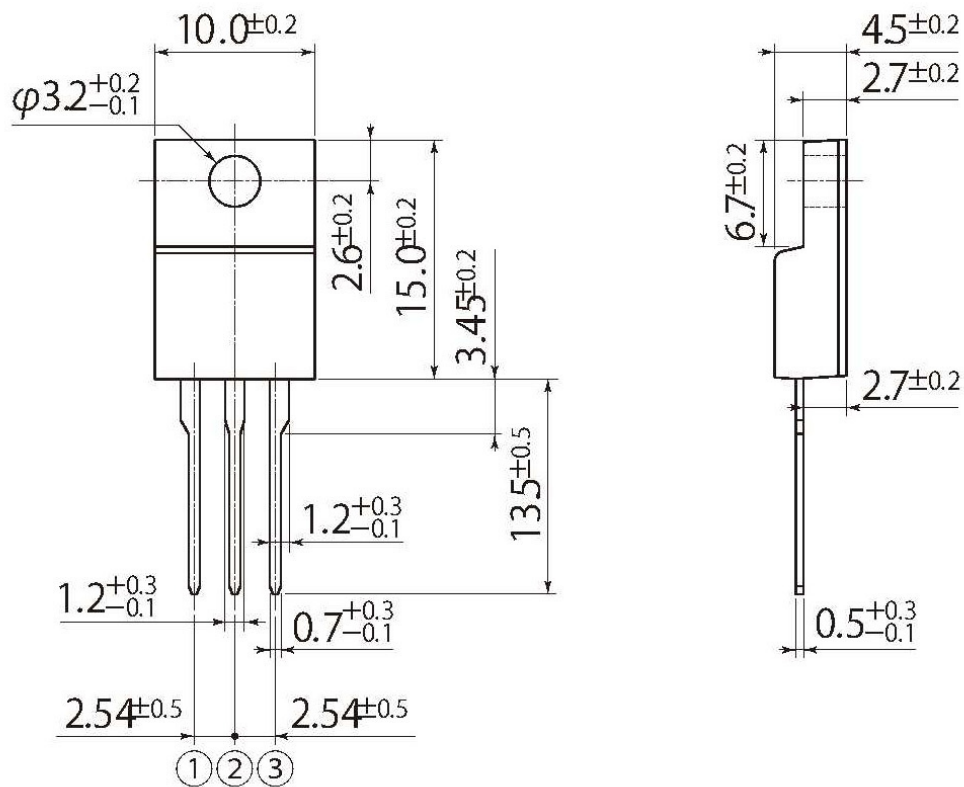


unit:mm

scale: 2/1

J8

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



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