

P40F12SN

Power MOSFETs
120V, 40A, N-channel

Feature

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

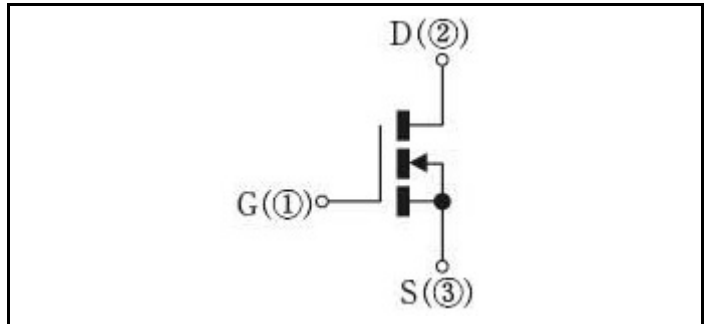
OUTLINE

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 temperature	Tch		150	°C
Drain-source voltage	V _{DSS}		120	V
Gate-source voltage	V _{GSS}		±20	V
Continuous drain current(DC)	I _D		40	A
Continuous drain current(Peak)	I _{DP}	Pulse width 10µs, duty=1/100	160	A
Total power dissipation	P _T		51	W
Single avalanche current	I _{AS}	Starting Tch=25°C Tch≤150°C	40	A
Single avalanche energy	E _{AS}	Starting Tch=25°C Tch≤150°C	80	mJ
Dielectric strenght	V _{dis}	Terminals to case, AC1min	2	kV
Mounting torque	TOR	(Recommended torque : 0.3N·m)	0.5	N·m

* : See the original Specifications

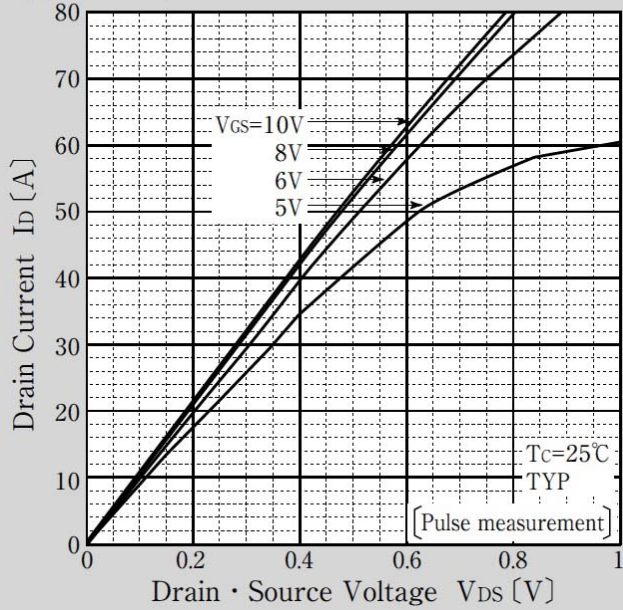
Electrical Characteristics (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	120			V
Zero gate voltage drain current	I_{DSS}	VDS=120V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=20A, VDS=10V	14			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=20A, VGS=10V		0.0095	0.0119	Ω
Gate threshold voltage	V_{th}	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	V_{SD}	IS=40A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case			2.45	°C/W
Total gate charge	Q_g	VDD=96V, VGS=10V, ID=40A		117		nC
Gate to source charge	Q_{gs}	VDD=96V, VGS=10V, ID=40A		29		nC
Gate to drain charge	Q_{gd}	VDD=96V, VGS=10V, ID=40A		39		nC
Input capacitance	C_{iss}	VDS=25V, VGS=0V, f=1MHz		6000		pF
Reverse transfer capacitance	C_{rss}	VDS=25V, VGS=0V, f=1MHz		220		pF
Output capacitance	C_{oss}	VDS=25V, VGS=0V, f=1MHz		470		pF
Turn-on delay time	$t_{d(on)}$	ID=20A, RL=3Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		12		ns
Rise time	t_r	ID=20A, RL=3Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		23		ns
Turn-off delay time	$t_{d(off)}$	ID=20A, RL=3Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		64		ns
Fall time	t_f	ID=20A, RL=3Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		43		ns
Diode reverse recovery time	t_{rr}	IF=40A, VGS=0V, di/dt=100A/μs		68		ns
Diode reverse recovery charge	Q_{rr}	IF=40A, VGS=0V, di/dt=100A/μs		191		nC

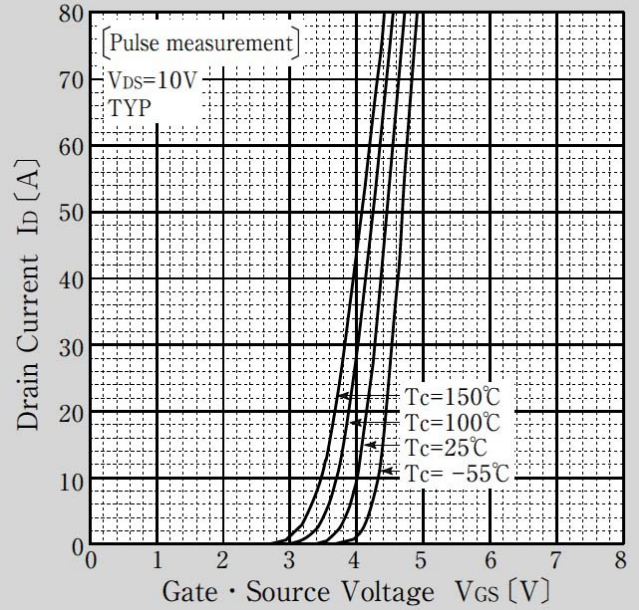
※ : See the original Specifications

CHARACTERISTIC DIAGRAMS

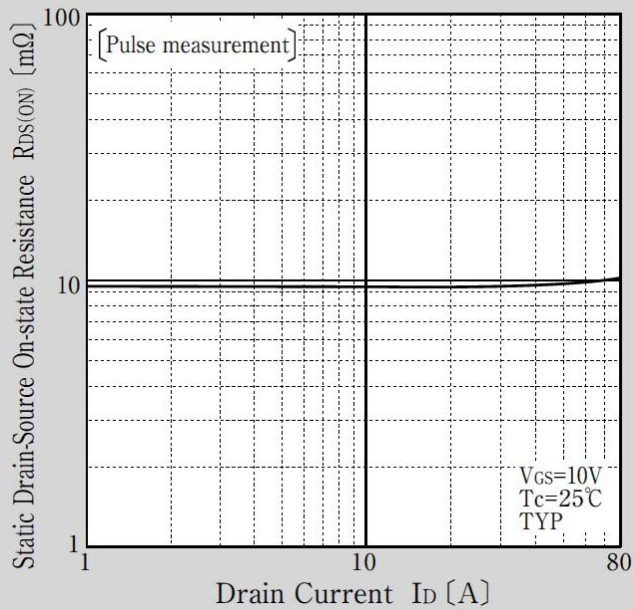
Typical Output Characteristics



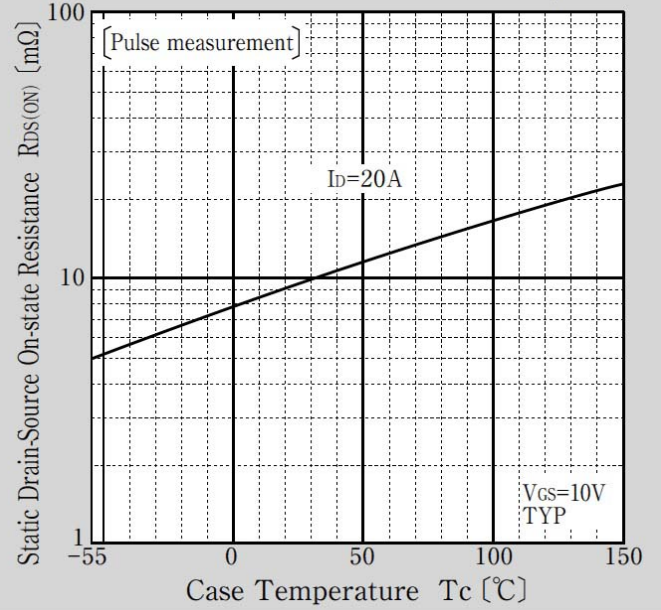
Transfer Characteristics



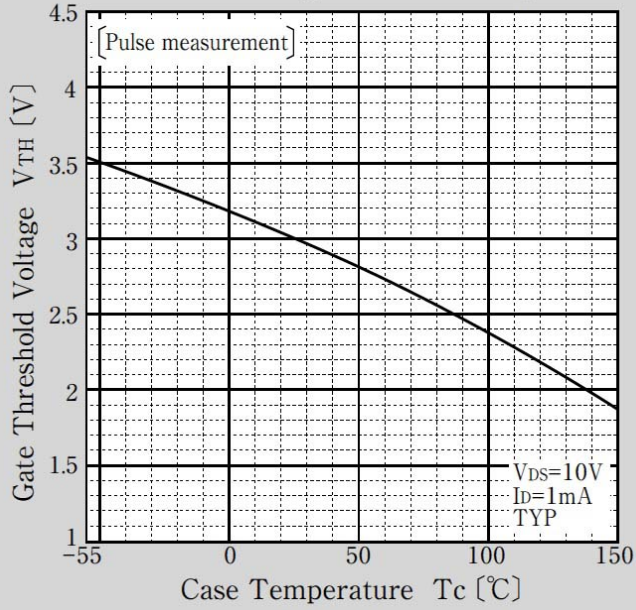
Static Drain-Source On-state Resistance vs Drain Current



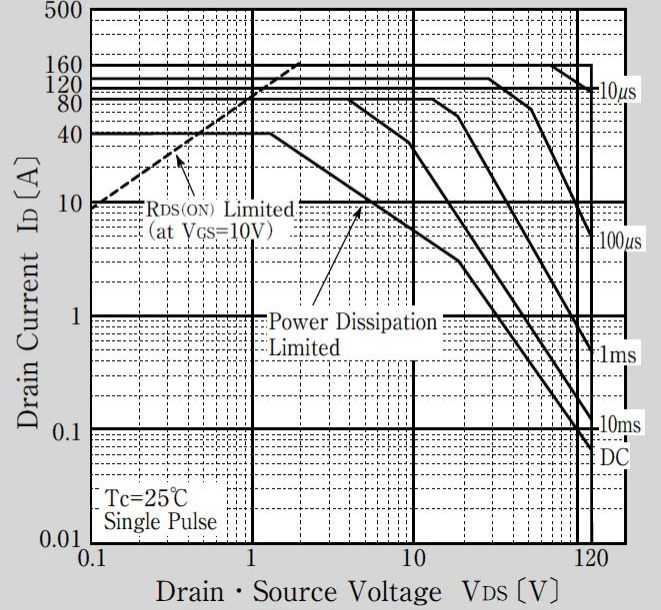
Static Drain-Source On-state Resistance vs Case Temperature



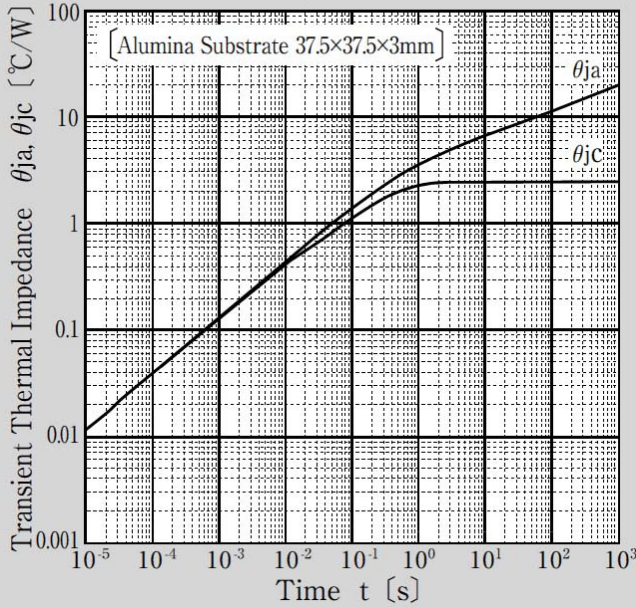
Gate Threshold Voltage vs Case Temperature



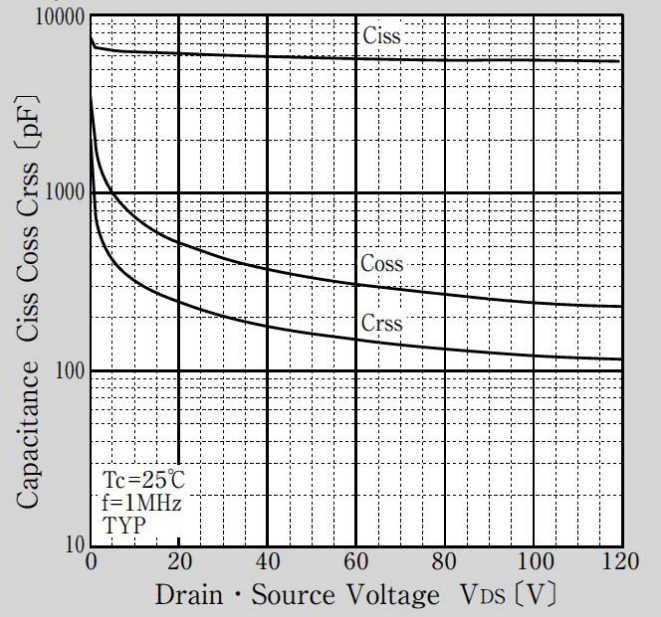
Safe Operating Area



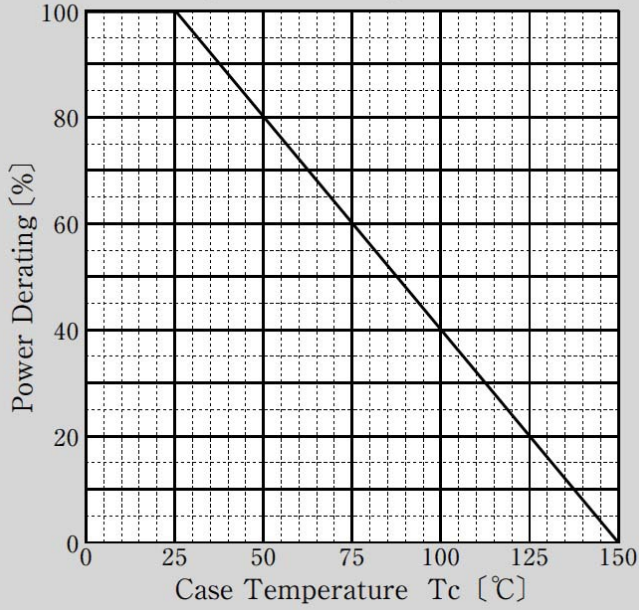
Transient Thermal Impedance



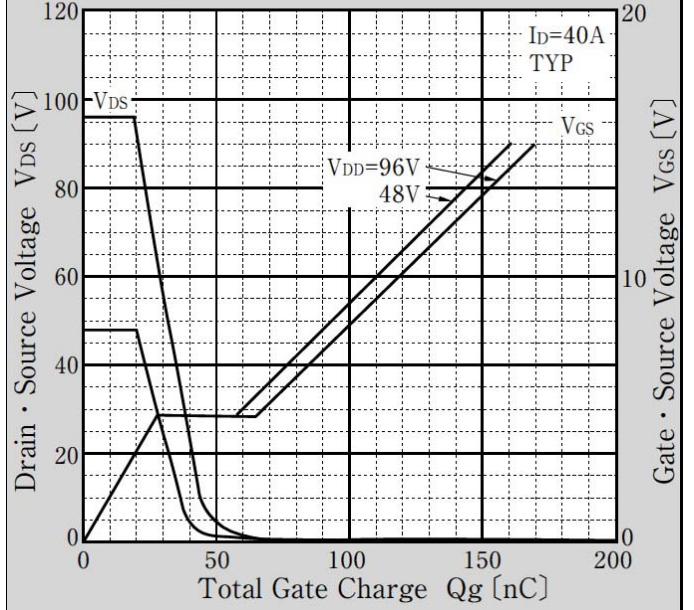
Capacitance Characteristics



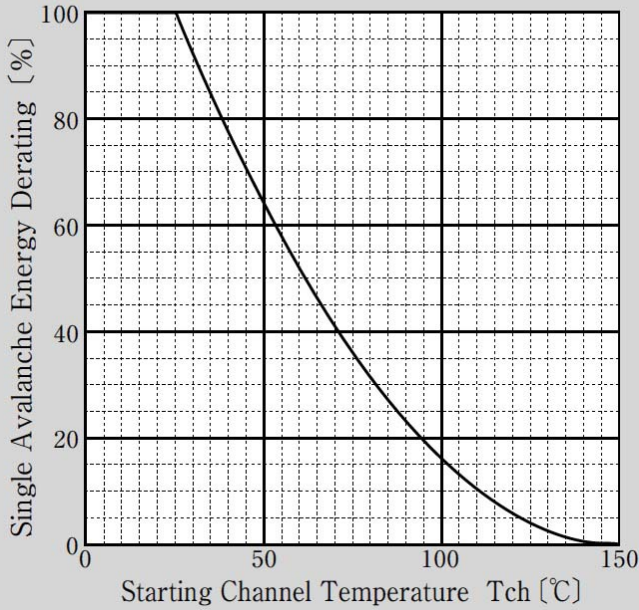
Power Derating - Case Temperature



Gate Charge Characteristics

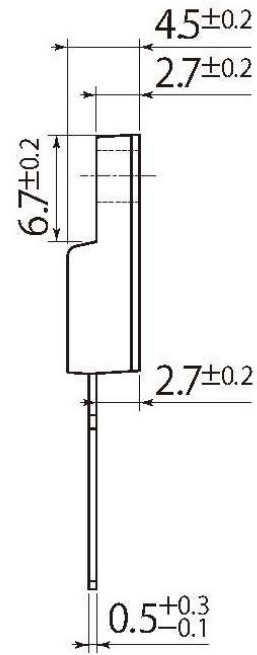
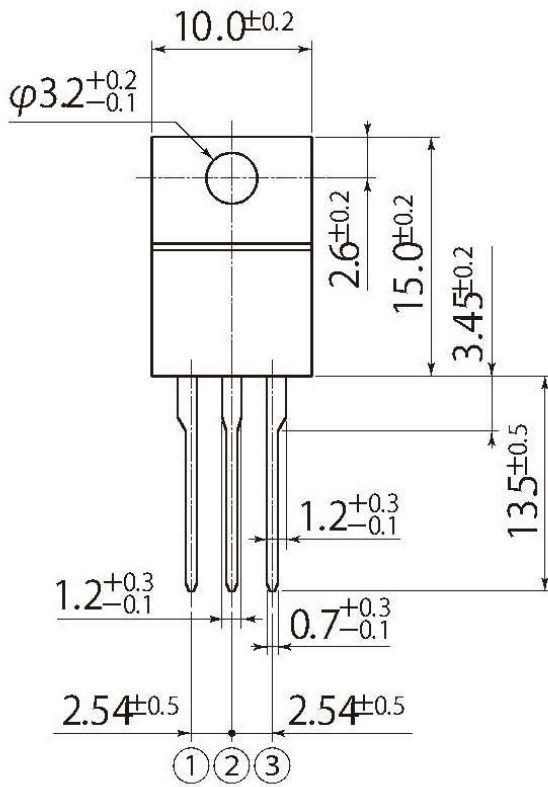


Single Avalanche Energy Derating vs Channel Temperature



J8

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



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