

P13F50HP2

Power MOSFETs

500V, 13A, N-channel

Feature

- N-channel
- High Voltage
- High Speed Switching
- Low Capacitance
- High Avalanche Durability, High di/dt Durability
- Pb free terminal
- RoHS:Yes

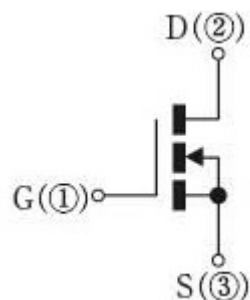
OUTLINE

Package (House Name): FTO-220AG

Package (JEITA Code): SC-91



Equivalent circuit



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

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	T _{stg}		-55 to 150	°C
Channel temperature	T _{ch}		150	°C
Drain-source voltage	V _{DSS}		500	V
Gate-source voltage	V _{GSS}		±30	V
Continuous drain current(DC)	I _D		13	A
Continuous drain current(Peak)	I _{DP}	Pulse width 10μs, duty=1/100	52	A
Continuous source current(DC)	I _S		13	A
Total power dissipation	P _T		85	W
Repetitive avalanche current	I _{AR}	Starting T _{ch} =25°C T _{ch} ≤150°C	13	A
Single avalanche energy	E _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	70	mJ
Repetitive avalanche energy	E _{AR}	Starting T _{ch} =25°C T _{ch} ≤150°C	7	mJ
Drain-source diode di/dt strength	di/dt	I _S =13A, T _c =25°C	350	A/μs
Dielectric strength	V _{dis}	Terminals to case, AC1min	2	kV
Mounting torque	TOR	(Recommended torque : 0.3N·m)	0.5	N·m

※ :See the original Specifications

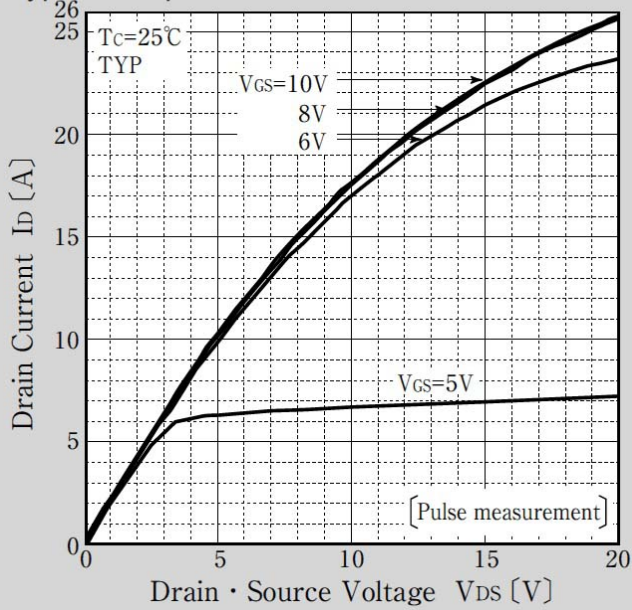
Electrical Characteristics (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	500			V
Zero gate voltage drain current	I_{DSS}	VDS=500V, VGS=0V			100	μA
Gate-source leakage current	I_{GSS}	VGS=±30V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=6.5A, VDS=10V	7	13.5		S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=6.5A, VGS=10V		0.48	0.6	Ω
Gate threshold voltage	V_{th}	ID=1mA, VDS=10V	3	3.75	4.5	V
Source-drain diode forward voltage	V_{SD}	IS=6.5A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case			1.47	°C/W
Total gate charge	Q_g	VDD=400V, VGS=10V, ID=13A		25		nC
Input capacitance	C_{iss}	VDS=50V, VGS=0V, f=1MHz		1050		pF
Reverse transfer capacitance	C_{rss}	VDS=50V, VGS=0V, f=1MHz		6		pF
Output capacitance	C_{oss}	VDS=50V, VGS=0V, f=1MHz		105		pF
Turn-on delay time	$t_{d(on)}$	ID=6.5A, RL=23Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		24		ns
Rise time	t_r	ID=6.5A, RL=23Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		43		ns
Turn-off delay time	$t_{d(off)}$	ID=6.5A, RL=23Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		80		ns
Fall time	t_f	ID=6.5A, RL=23Ω, VDD=150V, Rg=50Ω, VGS(+)=10V, VGS(-)=0V		32		ns

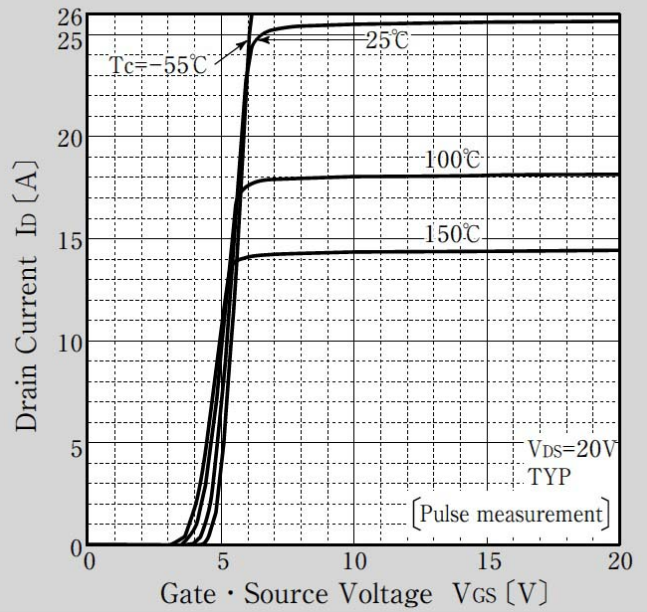
* : See the original Specifications

CHARACTERISTIC DIAGRAMS

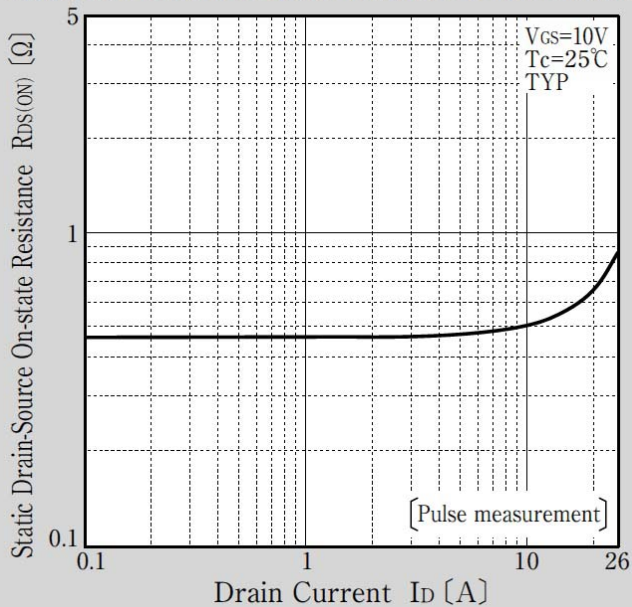
Typical Output Characteristics



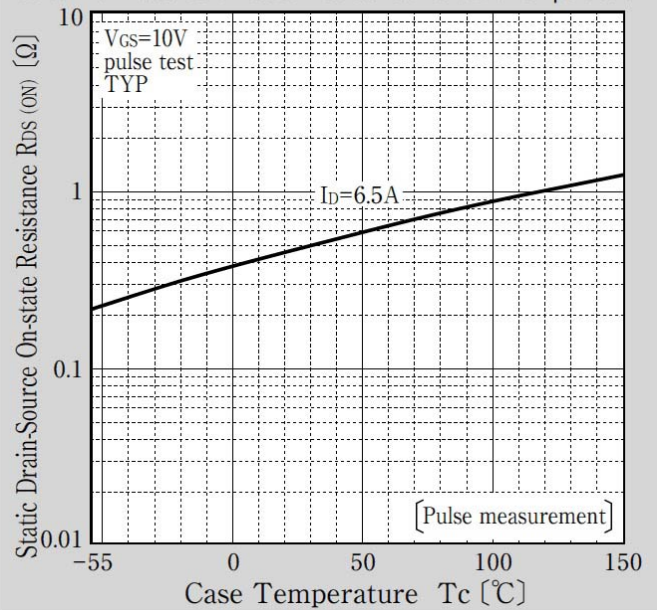
Transfer Characteristics



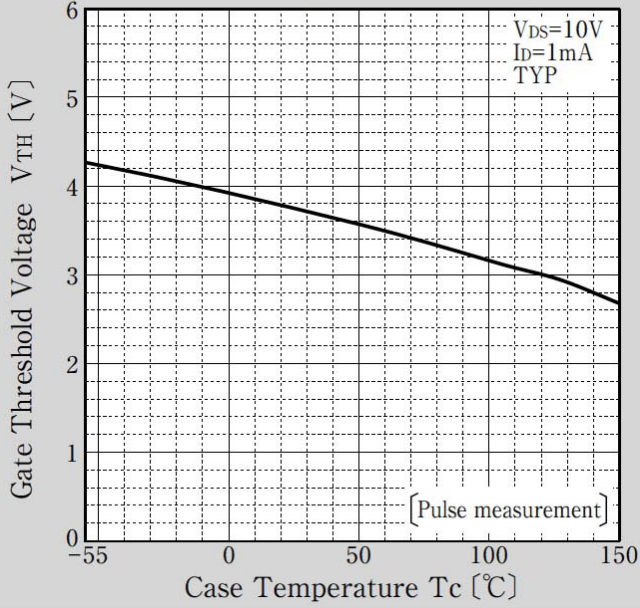
Static Drain-Source On-state Resistance vs Drain Current



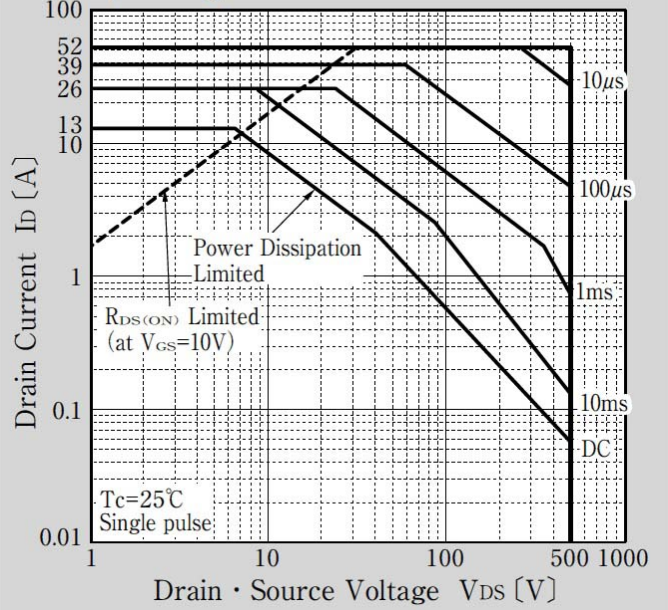
Static Drain-Source On-state Resistance vs Case Temperature



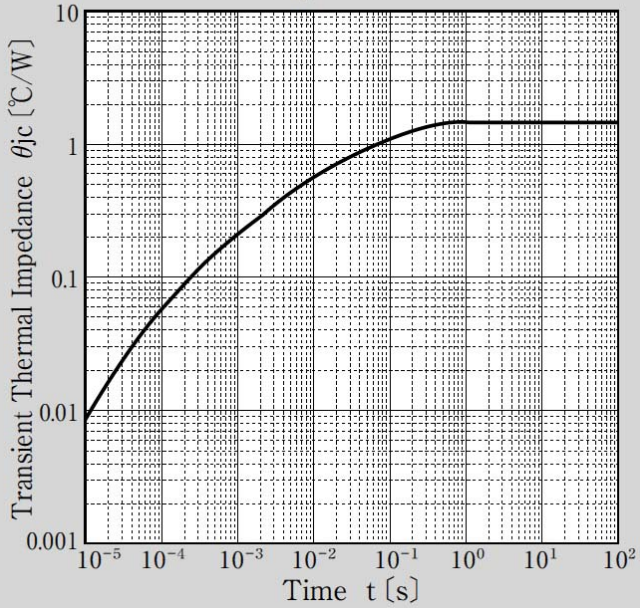
Gate Threshold Voltage vs Case Temperature



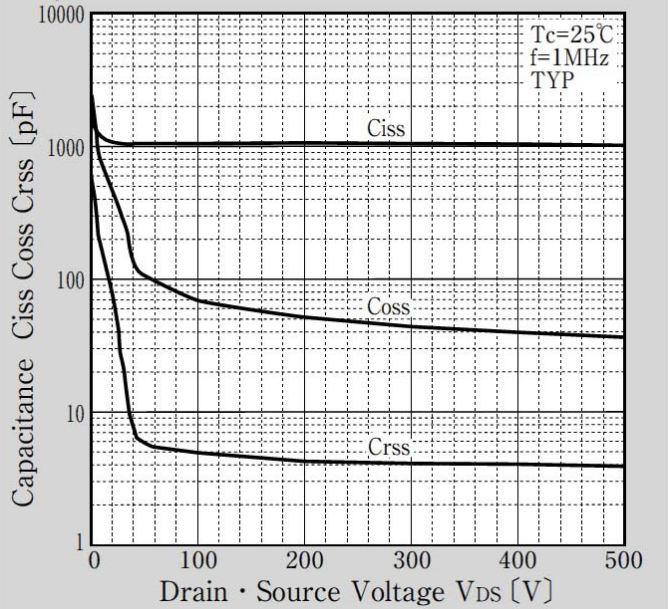
Safe Operating Area



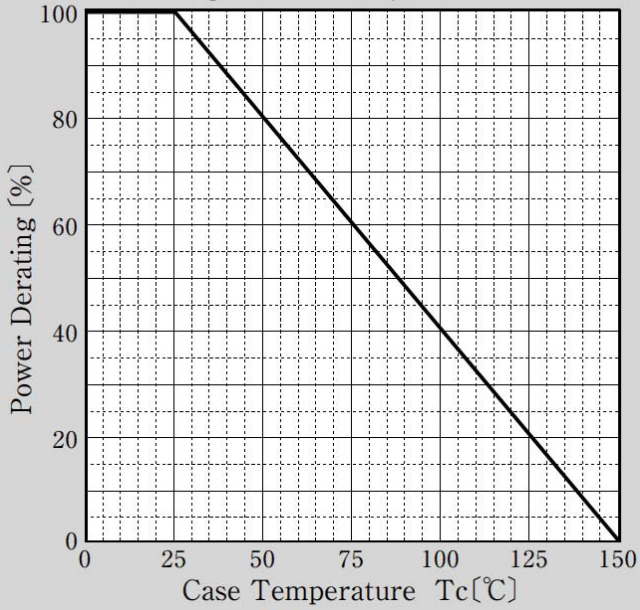
Transient Thermal Impedance



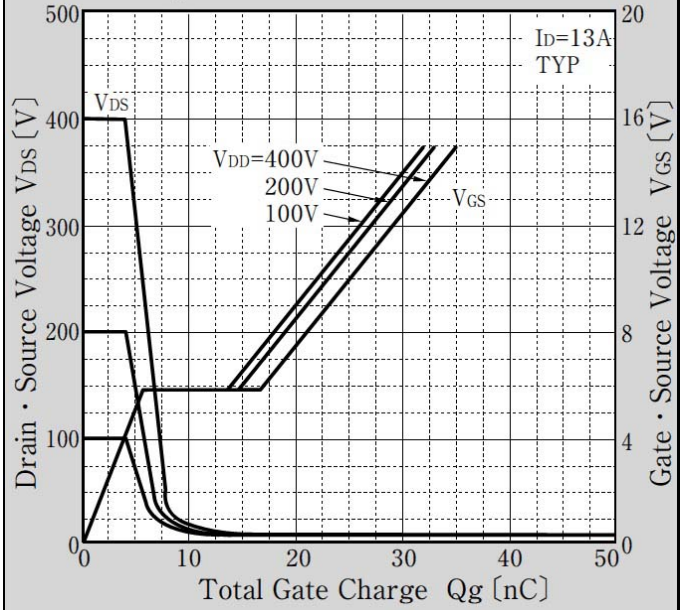
Capacitance Characteristics



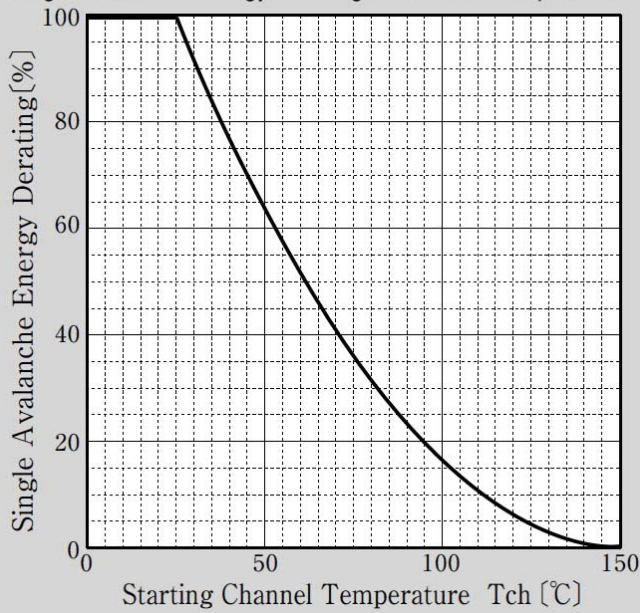
Power Derating - Case Temperature



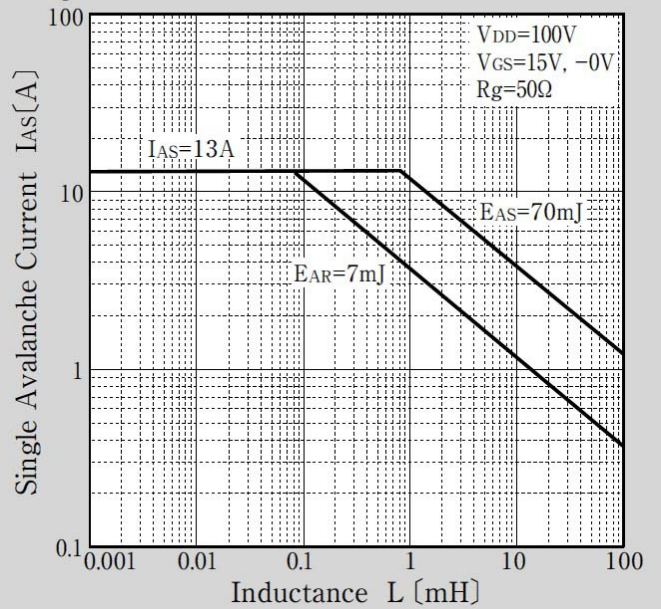
Gate Charge Characteristics



Single Avalanche Energy Derating vs Channel Temperature



Single Avalanche Current vs Inductive Load



Notes

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