

N-CHANNEL SILICON POWER MOSFET

FAP-III SERIES

Features

- High current
- Low on-resistance
- No secondary breakdown
- Low driving power
- High forward Transconductance
- Avalanche-proof

Applications

- Motor controllers
- General purpose power amplifier
- DC-DC converters

Maximum ratings and characteristics

Absolute maximum ratings (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V _{DS}	150	V
Continuous drain current	I _D	20	A
Pulsed drain current	I _{D(puls)}	80	A
Continuous reverse drain current	I _{DR}	20	A
Gate-source peak voltage	V _{GS}	±20	V
Max. power dissipation	P _D	50	W
Operating and storage temperature range	T _{ch}	+150	°C
	T _{stg}	-55 to +150	°C

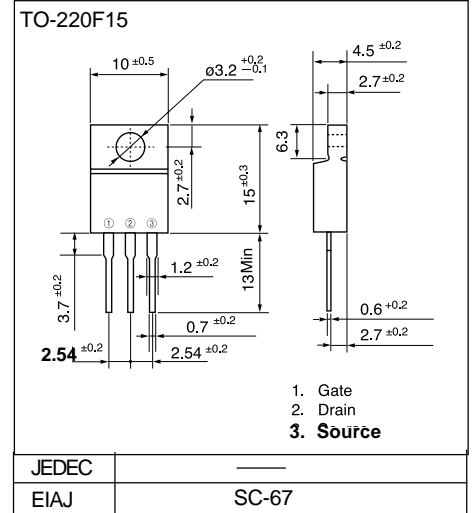
Electrical characteristics (Tc =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	150			V
Gate threshold voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	1.0	1.5	2.5	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =150V V _{GS} =0V	T _{ch} =25°C	10	500	μA
			T _{ch} =125°C	0.2	1.0	mA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V V _{DS} =0V		10	100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =10A	V _{GS} =4V	0.065	0.100	Ω
			V _{GS} =10V	0.055	0.080	
Forward transconductance	g _{fs}	I _D =10A V _{DS} =25V	10	20		S
Input capacitance	C _{iss}	V _{DS} =25V		2300	3450	pF
Output capacitance	C _{oss}	V _{GS} =0V		330	500	
Reverse transfer capacitance	C _{rss}	f=1MHz		150	230	
Turn-on time t _{on} (t _{on} =t _{d(on)} +t _r)	t _{d(on)}	V _{CC} =30V R _G =25 Ω		15	25	ns
	t _r	I _D =20A		20	30	
Turn-off time t _{off} (t _{off} =t _{d(off)} +t _f)	t _{d(off)}	V _{GS} =10V		450	700	
	t _f			100	150	
Avalanche capability	I _{AV}	L=100μH T _{ch} =25°C	20			A
Diode forward on-voltage	V _{SD}	I _F =2×I _{DR} V _{GS} =0V T _{ch} =25°C		1.00	1.50	V
Reverse recovery time	t _{rr}	I _F =I _{DR} V _{GS} =0V		125		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.6		μC

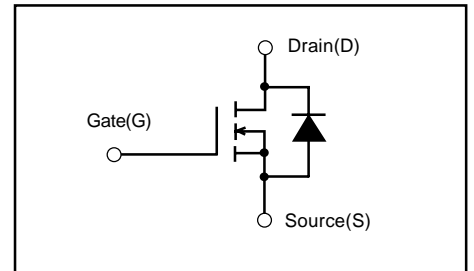
Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-a)}	channel to ambient			62.5	°C/W
	R _{th(ch-c)}	channel to case				

Outline Drawings

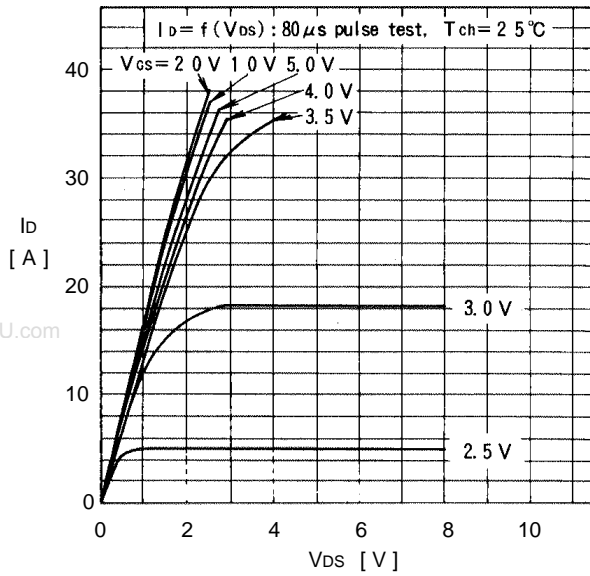


Equivalent circuit schematic

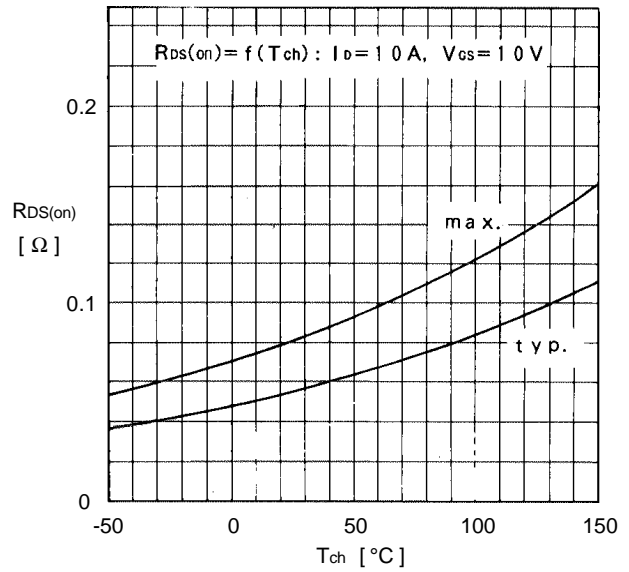


Characteristics

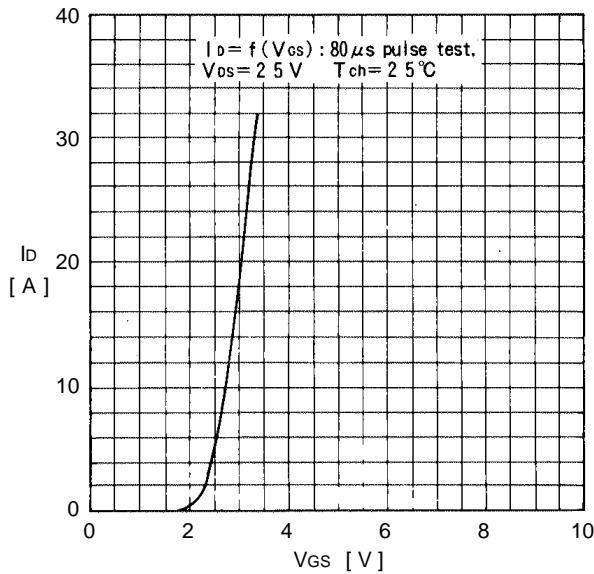
Typical output characteristics



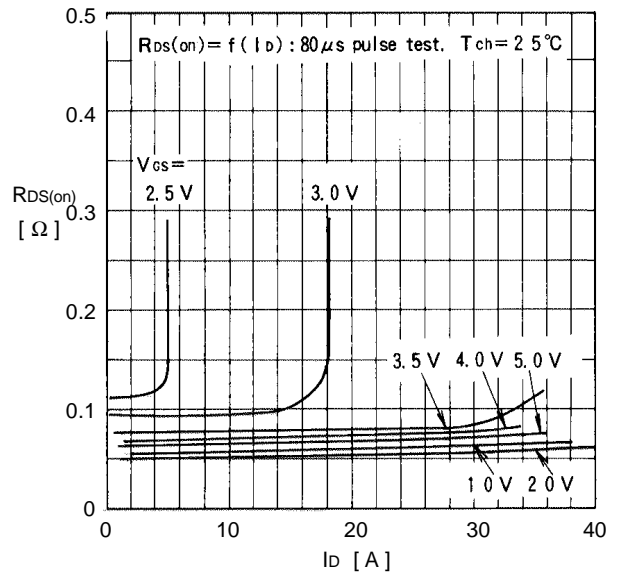
On state resistance vs. T_{ch}



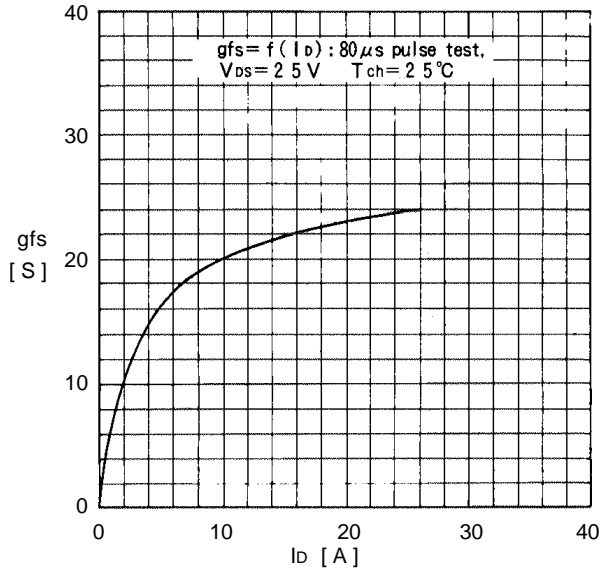
Typical transfer characteristics



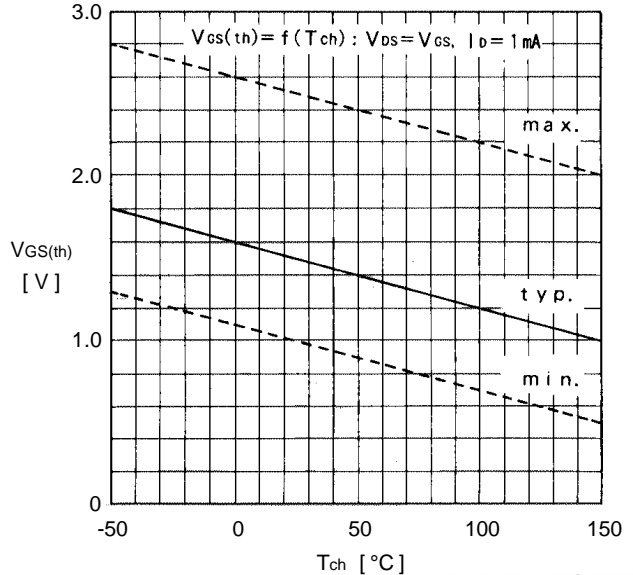
Typical Drain-Source on state resistance vs. I_D



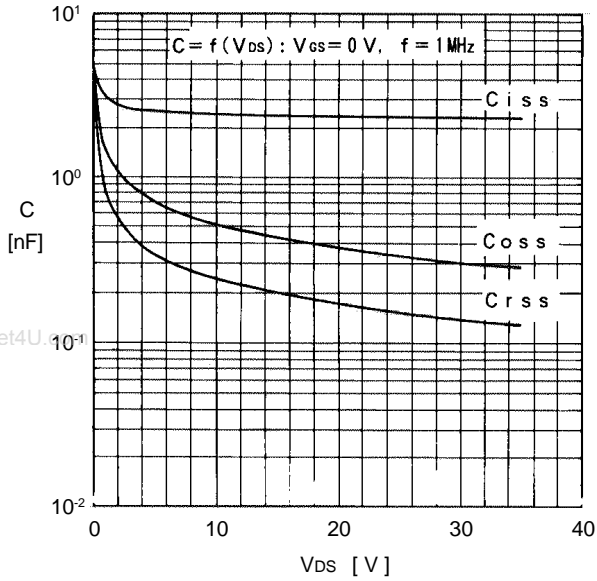
Typical forward transconductance vs. I_D



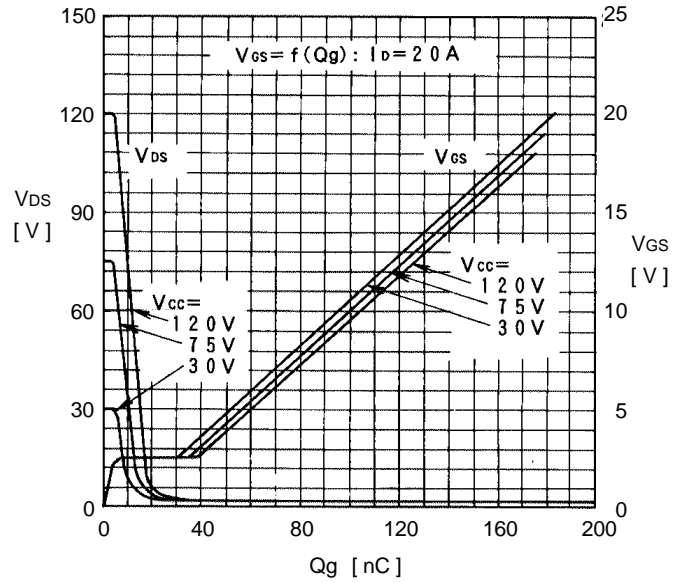
Gate threshold voltage vs. T_{ch}



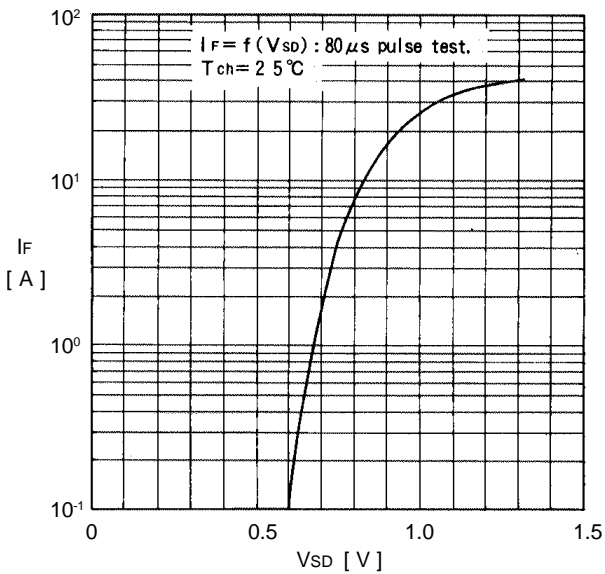
Typical capacitance vs. V_{DS}



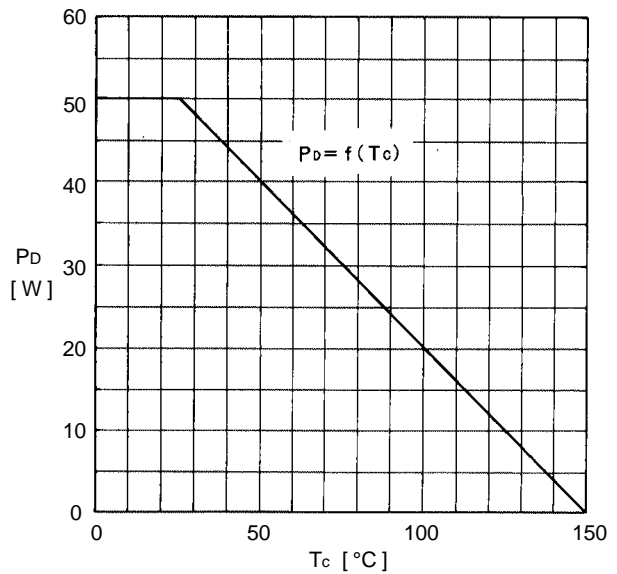
Typical input charge



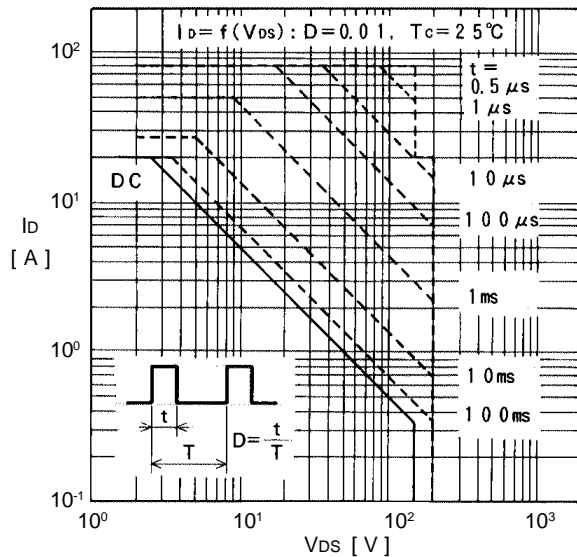
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Safe operating area



Transient thermal impedance

