

N-CHANNEL SILICON POWER MOSFET

FAP-IIA SERIES

Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- V_{GS}=±30V Guarantee
- Avalanche-proof

Applications

- Switching regulators
- UPS
- DC-DC converters
- General purpose power amplifier

Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit
Drain-source voltage	V _{DS}	600	V
Continuous drain current	I _D	4	A
Pulsed drain current	I _{D(puls)}	16	A
Continuous reverse drain current	I _{DR}	4	A
Gate-source peak voltage	V _{GS}	±30	V
Max. power dissipation	P _D	40	W
Operating and storage temperature range	T _{ch}	+150	°C
	T _{stg}	-55 to +150	°C

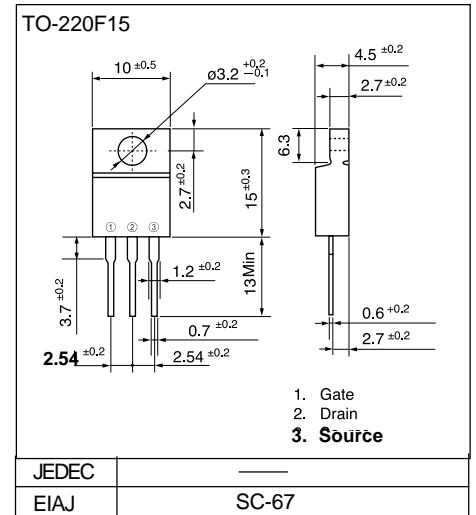
Electrical characteristics (T_c =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	600			V
Gate threshold voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	2.5	3.0	3.5	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =600V 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} =±30V V _{DS} =0V	10	100	nA	
Drain-source on-state resistance	R _{DS(on)}	I _D =2A V _{GS} =10V		2.0	2.4	Ω
Forward transconductance	g _{fs}	I _D =2A V _{DS} =25V	2	4		S
Input capacitance	C _{iss}	V _{DS} =25V		1000	1500	pF
Output capacitance	C _{oss}	V _{GS} =0V		85	130	
Reverse transfer capacitance	C _{rss}	f=1MHz		20	30	
Turn-on time t _{on} (t _{on} =t _{d(on)} +t _r)	t _{d(on)}	V _{CC} =300V R _G =10 Ω		20	30	ns
	t _r	I _D =4A		15	25	
Turn-off time t _{off} (t _{off} =t _{d(off)} +t _f)	t _{d(off)}	V _{GS} =10V		45	70	
	t _f			15	25	
Avalanche capability	I _{AV}	L=100μH T _{ch} =25°C	4			A
Diode forward on-voltage	V _{SD}	I _F =2xI _{DR} V _{GS} =0V T _{ch} =25°C		1.1	1.65	V
Reverse recovery time	t _{rr}	I _F =I _{DR} V _{GS} =0V		400		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		2		μC

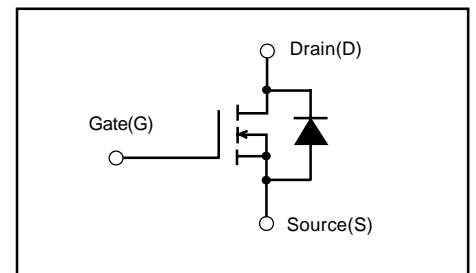
Thermal characteristics

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

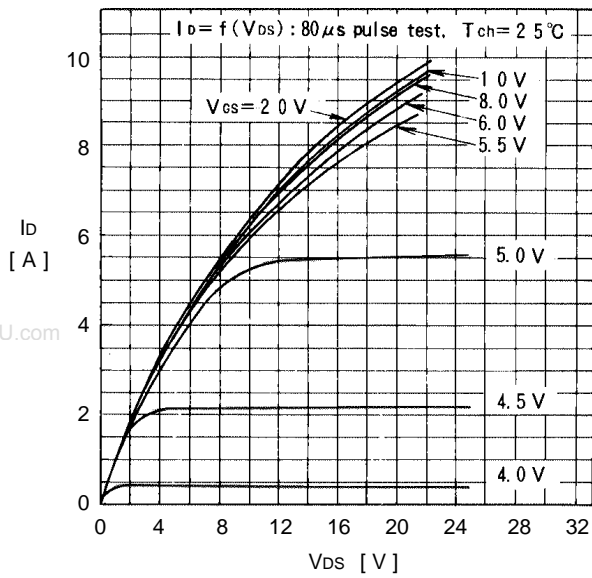


Equivalent circuit schematic

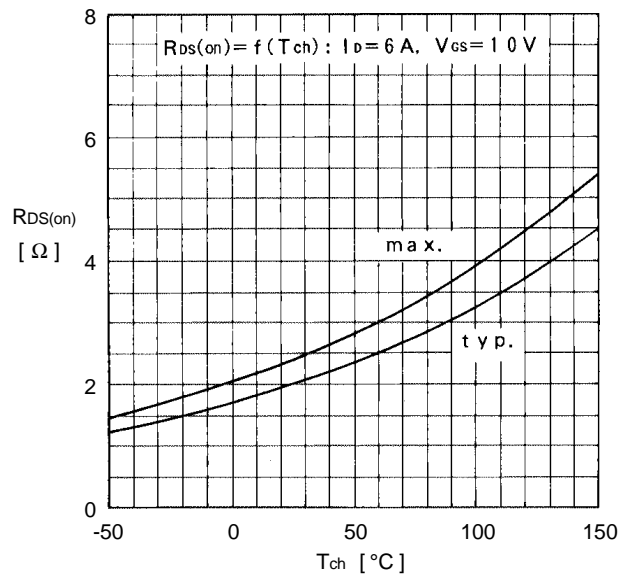


Characteristics

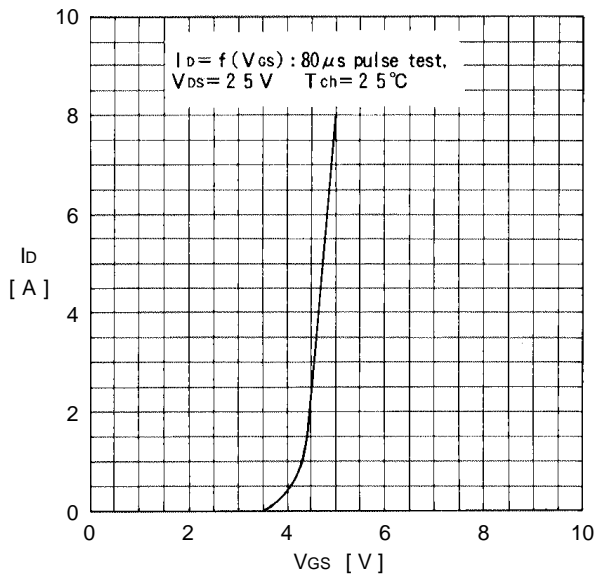
Typical output characteristics



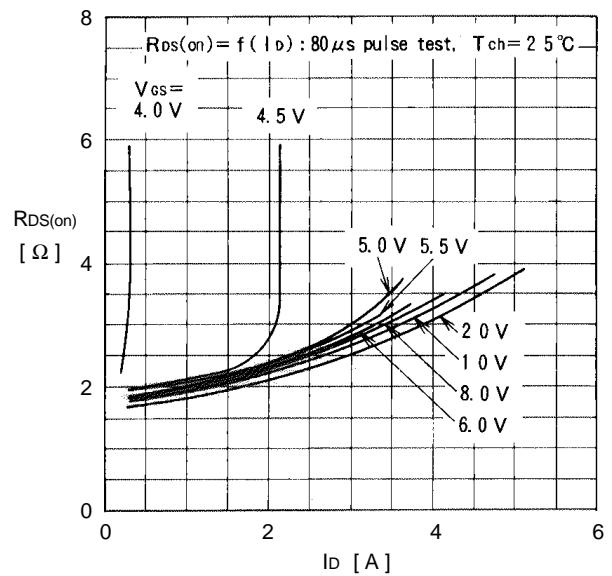
On state resistance vs. T_{ch}



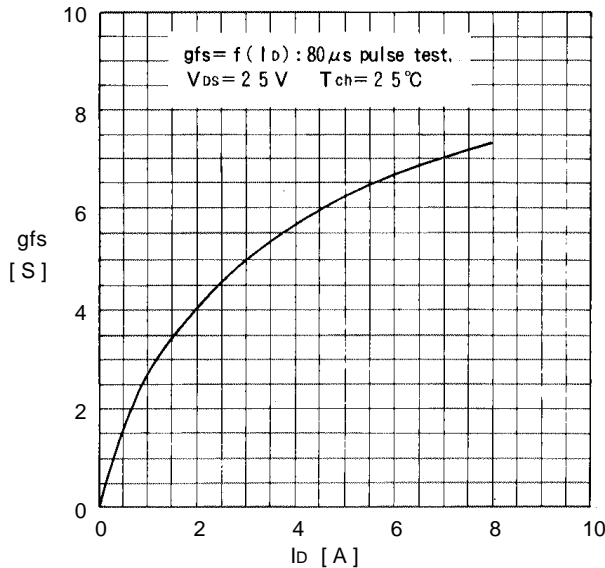
Typical transfer characteristics



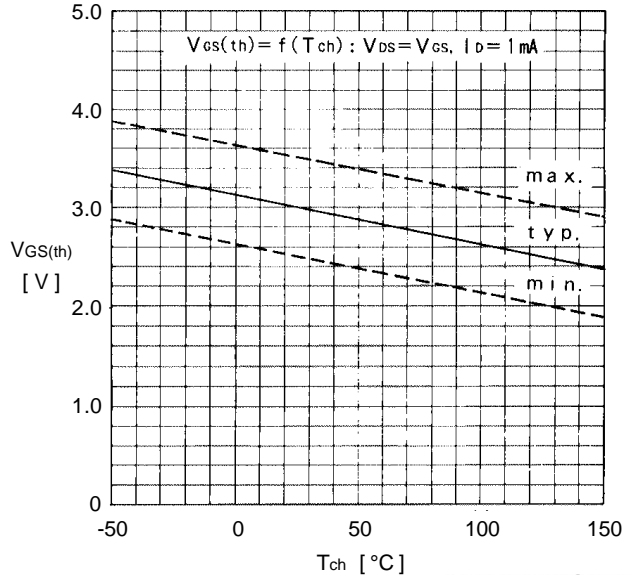
Typical Drain-Source on state resistance vs. I_D



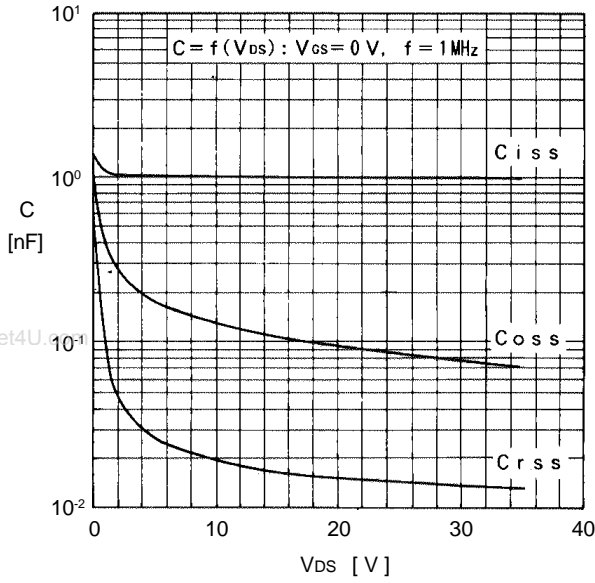
Typical forward transconductance vs. I_D



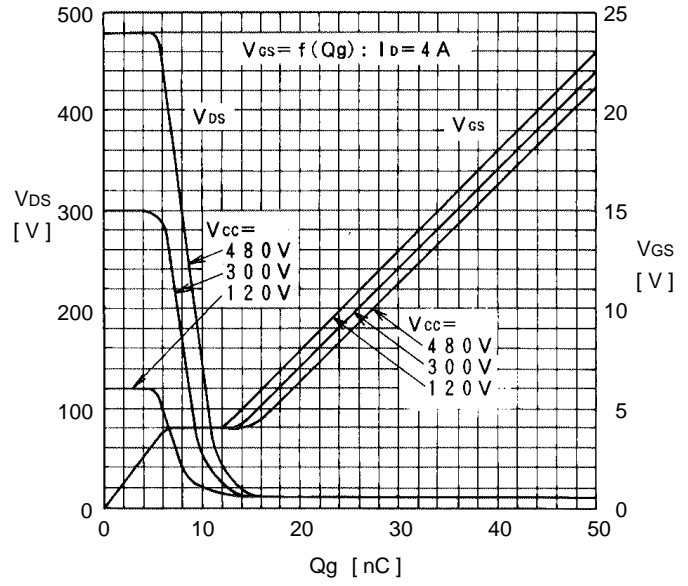
Gate threshold voltage vs. T_{ch}



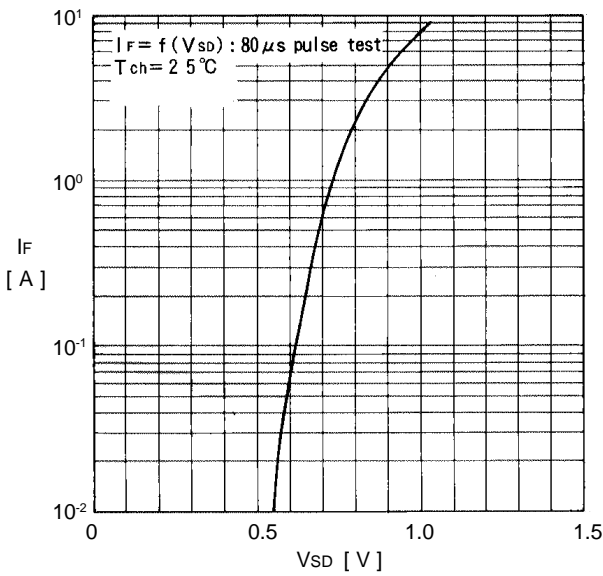
Typical capacitance vs. V_{DS}



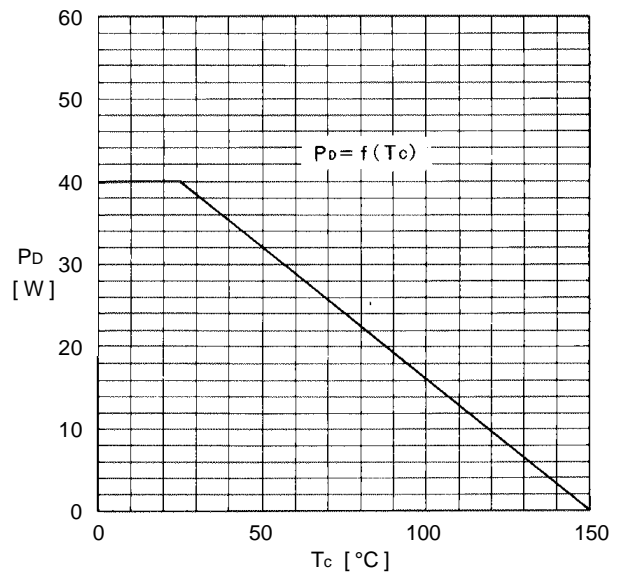
Typical input charge



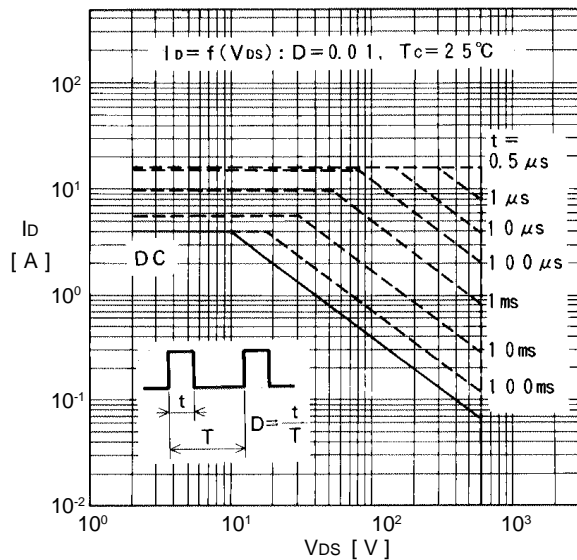
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Safe operating area



Transient thermal impedance

