

N-CHANNEL SILICON POWER MOSFET

F-III SERIES

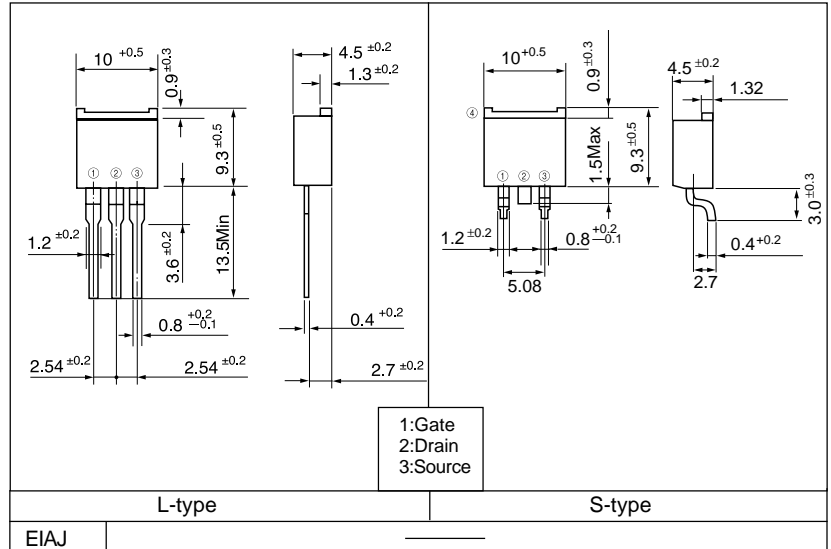
Features

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

Applications

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

Outline Drawings

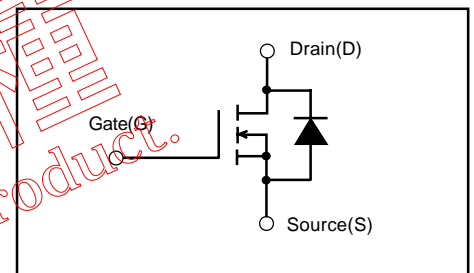


Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit
Drain-source voltage	V _{DS}	60	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	45	W
Operating and storage temperature range	T _{ch} T _{stg}	+150 -55 to +150	°C

Equivalent circuit schematic



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

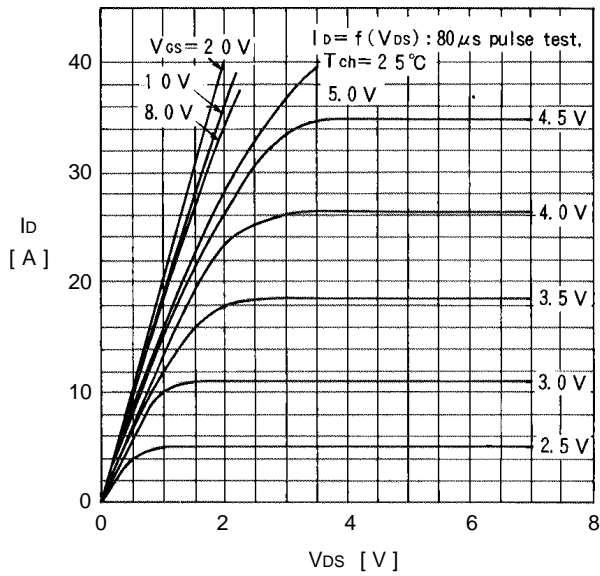
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	60			V
Gate threshold voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	1.0	1.5	2.0	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V V _{GS} =0V		10	500	μA
		T _{ch} =25°C		0.2	1.0	mA
		T _{ch} =125°C				
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		0.07	0.11	mΩ
		I _D =10A V _{GS} =10V		0.05	0.07	
Forward transconductance	g _{fs}	I _D =10A V _{DS} =25V	8.0	15.0		S
Input capacitance	C _{iss}	V _{DS} =25V		860	1300	pF
Output capacitance	C _{oss}	V _{GS} =0V		300	450	
Reverse transfer capacitance	C _{rss}	f=1MHz		100	150	
Turn-on time t _{on}	t _{d(on)}	V _{CC} =30V R _G =25 Ω		10	15	ns
(t _{on} =t _{d(on)} +t _r)	t _r	I _D =20A		40	60	
Turn-off time t _{off}	t _{d(off)}	V _{GS} =10V		150	230	ns
(t _{off} =t _{d(off)} +t _f)	t _f			50	80	
Diode forward on-voltage	V _{SD}	I _F =2xI _{DR} V _{GS} =0V T _{ch} =25°C		1.25	1.80	
Reverse recovery time	t _{rr}	I _F =I _{DR} di/dt=100A/μs T _{ch} =25°C		60		

Thermal characteristics

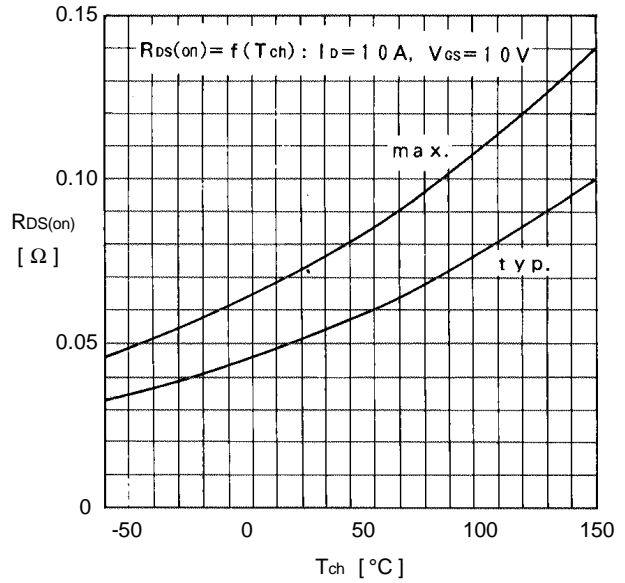
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-a)}	channel to ambient			125	°C/W
	R _{th(ch-c)}	channel to case			2.78	°C/W

Characteristics

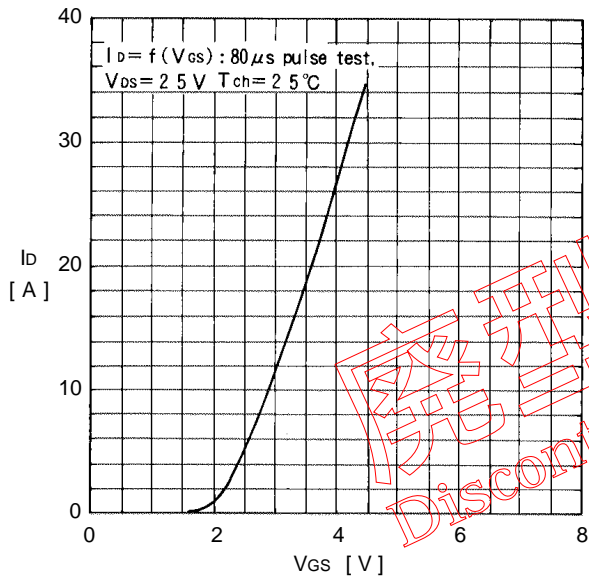
Typical output characteristics



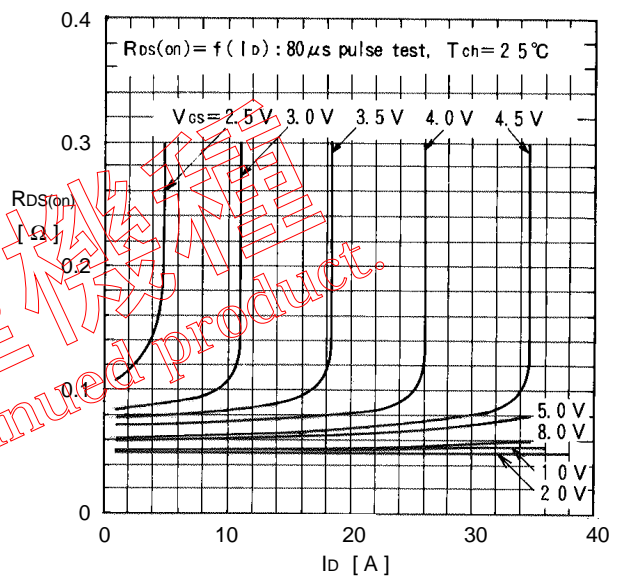
On state resistance vs. T_{ch}



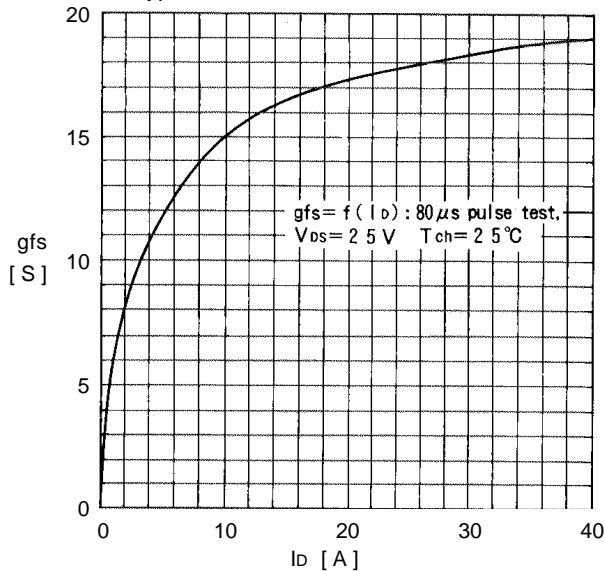
Typical transfer characteristics



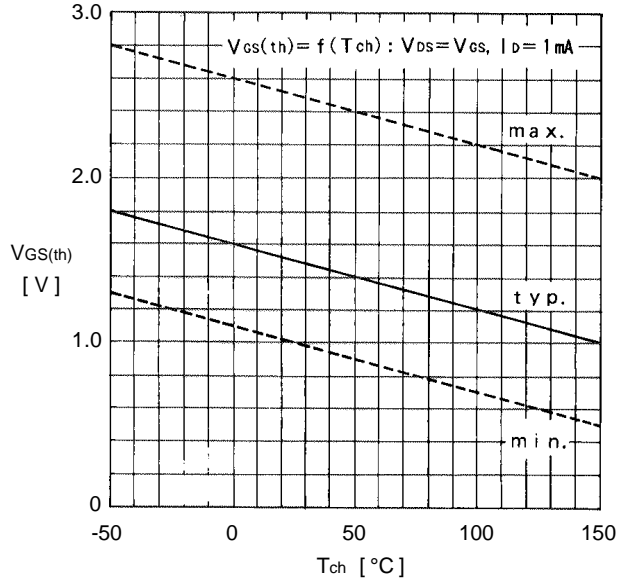
Typical Drain-Source on state resistance vs. I_D



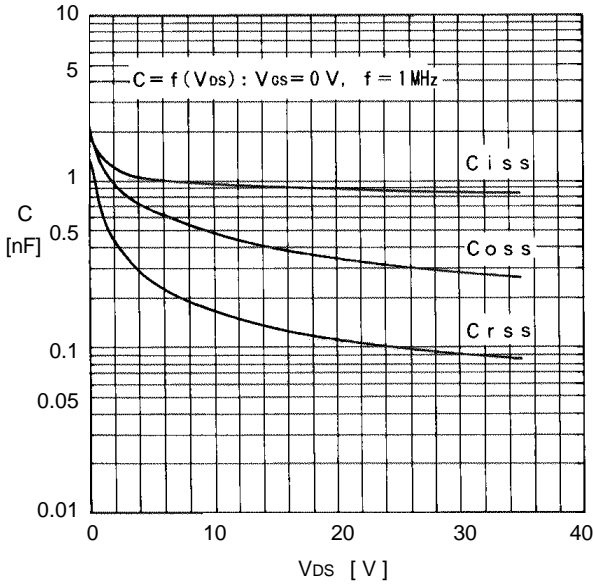
Typical forward transconductance vs. I_D



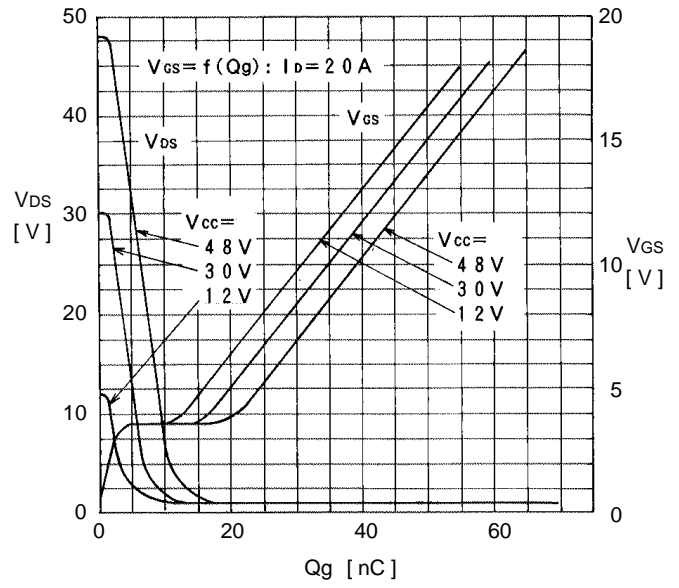
Gate threshold voltage vs. T_{ch}



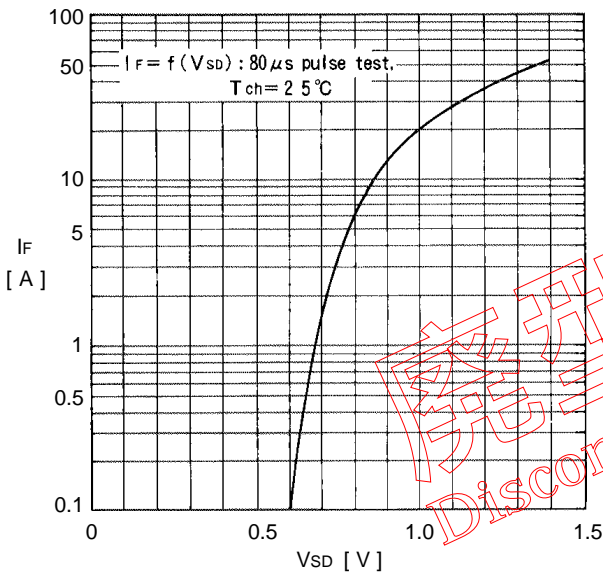
Typical capacitance vs. V_{DS}



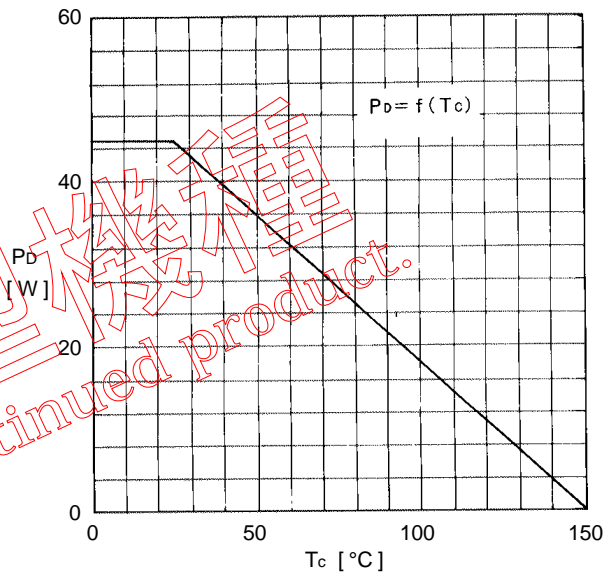
Typical input charge



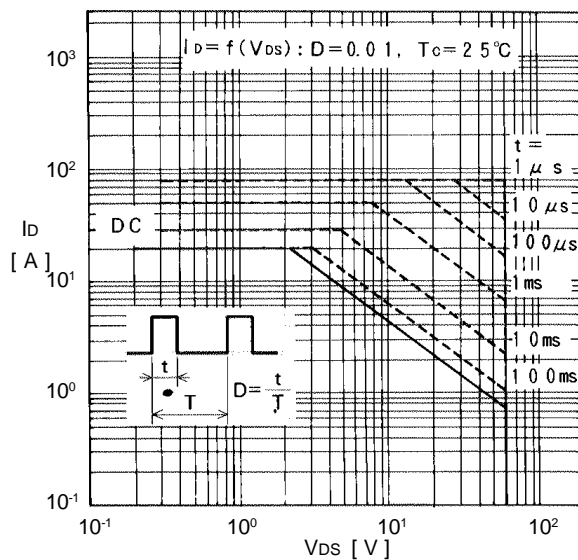
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Safe operating area



Transient thermal impedance

