

N-CHANNEL SILICON POWER MOSFET

F-II SERIES

■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- $V_{GS}=\pm 30V$ Guarantee

■ Applications

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

■ Maximum ratings and characteristics

● Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	250	V
Continuous drain current	I_D	10	A
Pulsed drain current	$I_{D(puls)}$	28	A
Continuous reverse drain current	I_{DR}	10	A
Gate-source peak voltage	V_{GS}	± 30	V
Max. power dissipation	P_D	50	W
Operating and storage temperature range	T_{ch}	+150	$^\circ\text{C}$
	T_{stg}	-55 to +150	$^\circ\text{C}$

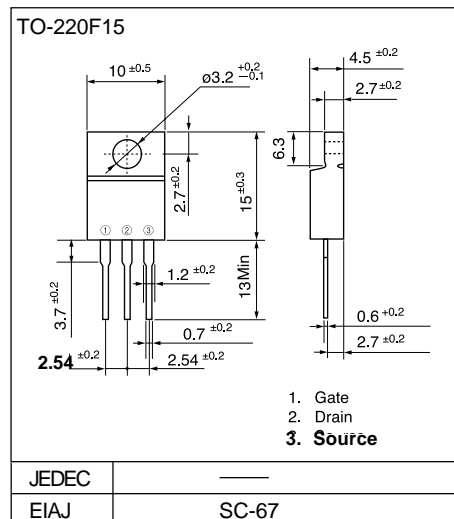
● Electrical characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	250			V	
Gate threshold voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	2.5	3.5	5.0	V	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=250\text{V}$ $V_{GS}=0\text{V}$	$T_{ch}=25^\circ\text{C}$		10	500	μA
			$T_{ch}=125^\circ\text{C}$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA	
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=5\text{A}$ $V_{GS}=10\text{V}$		0.3	0.4	Ω	
Forward transconductance	g_{fs}	$I_D=5\text{A}$ $V_{DS}=25\text{V}$	2.0	4.5		S	
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$		570	860	pF	
Output capacitance	C_{oss}	$V_{GS}=0\text{V}$		140	210		
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$		70	110		
Turn-on time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$t_{d(on)}$	$V_{CC}=150\text{V}$ $R_G=25\ \Omega$		20	30	ns	
	t_r	$I_D=10\text{A}$		40	60		
Turn-off time t_{off} ($t_{off}=t_{d(off)}+t_f$)	$t_{d(off)}$	$V_{GS}=10\text{V}$		100	150	ns	
	t_f			50	75		
Diode forward on-voltage	V_{SD}	$I_F=2 \times I_{DR}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.12	1.68	V	
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ $di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		140		ns	

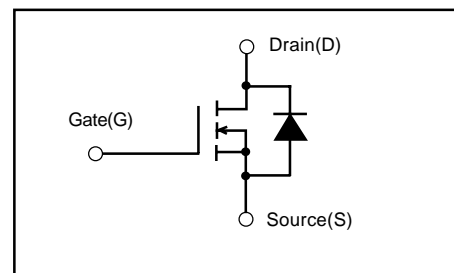
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to ambient			62.5	$^\circ\text{C}/\text{W}$
	$R_{th(ch-c)}$	channel to case			2.5	$^\circ\text{C}/\text{W}$

■ Outline Drawings

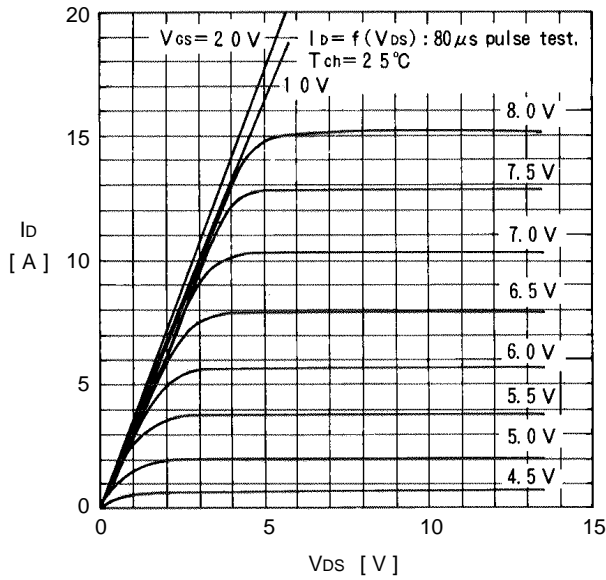


■ Equivalent circuit schematic

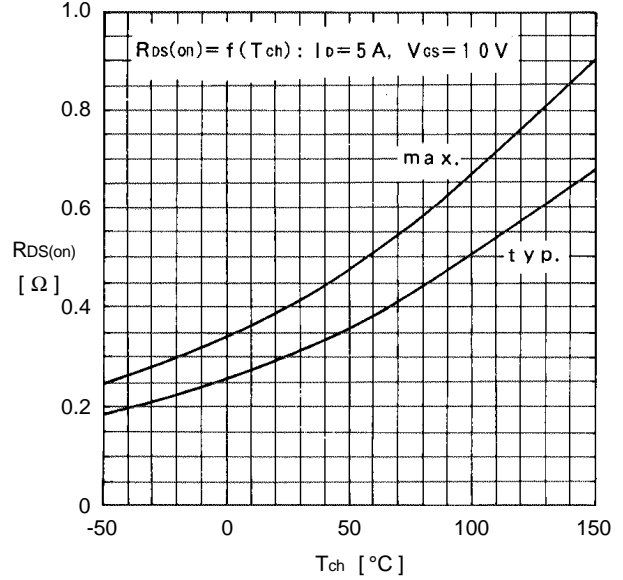


Characteristics

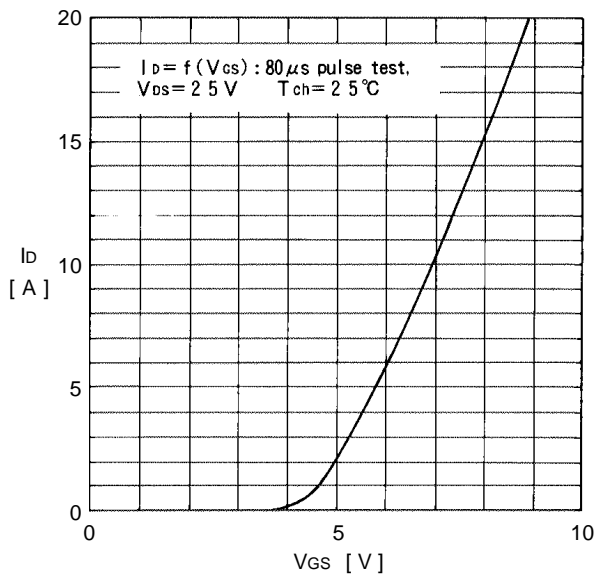
Typical output characteristics



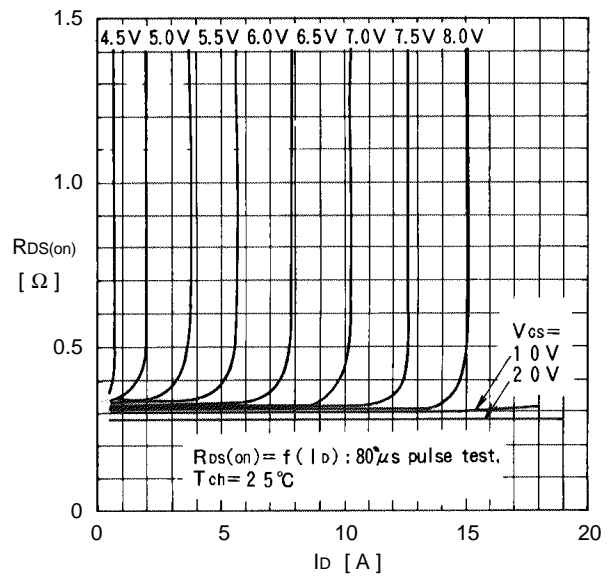
On state resistance vs. T_{ch}



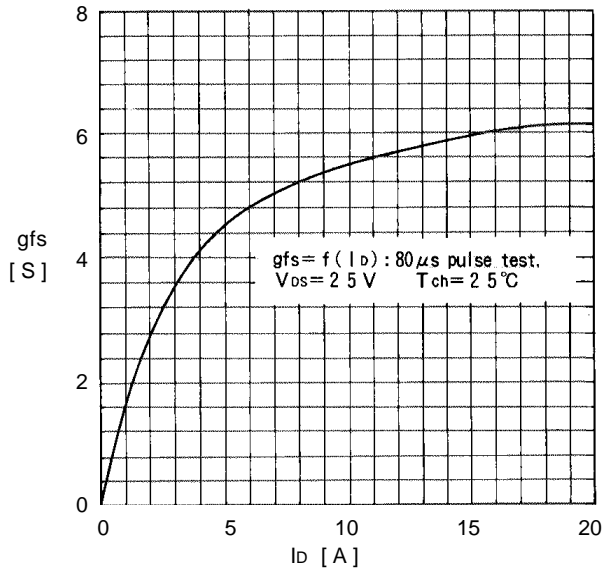
Typical transfer characteristics



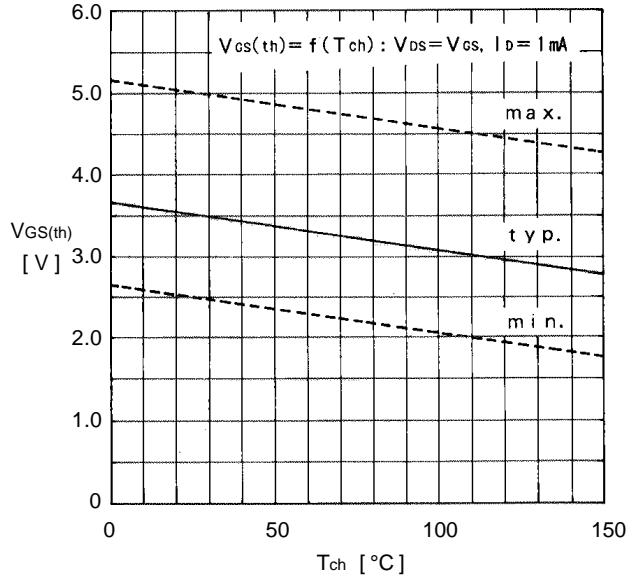
Typical Drain-Source on state resistance vs. I_D



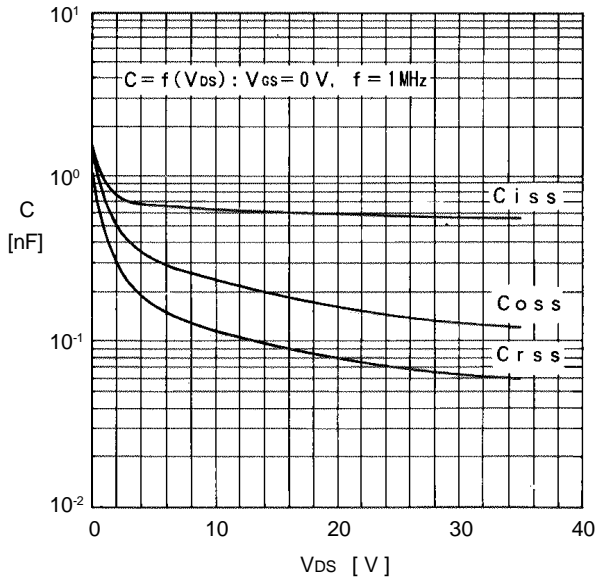
Typical forward transconductance vs. I_D



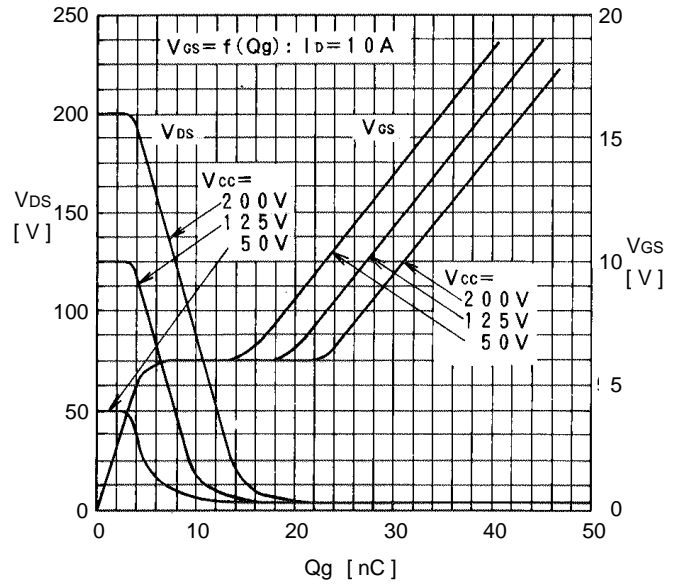
Gate threshold voltage vs. T_{ch}



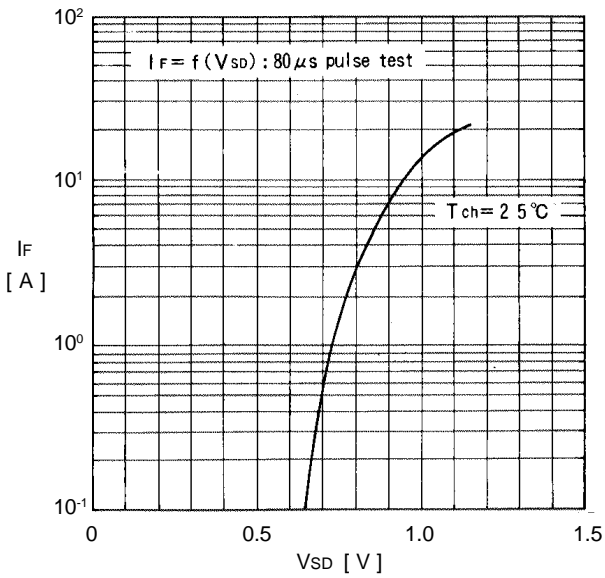
Typical capacitance vs. V_{DS}



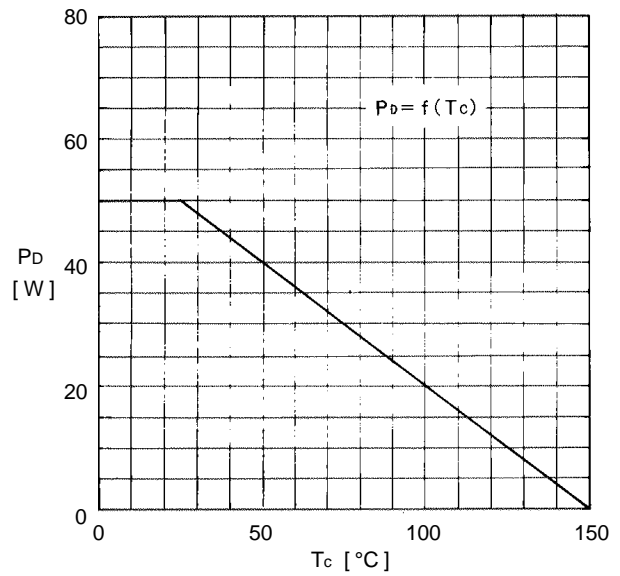
Typical input charge



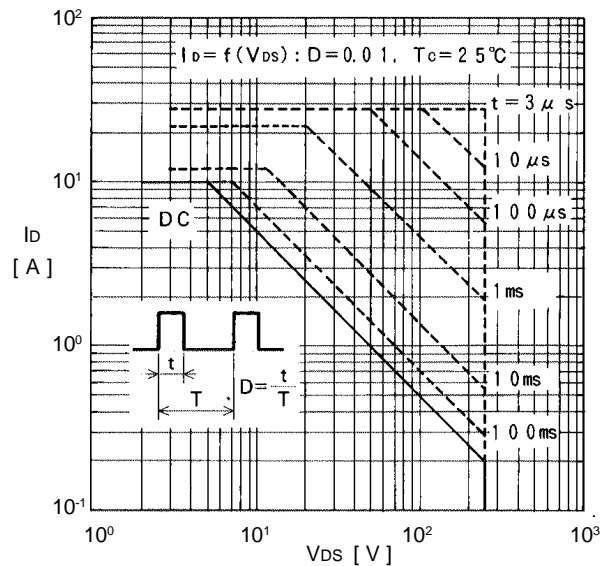
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Safe operating area



Transient thermal impedance

