

N-CHANNEL SILICON POWER MOS-FET

F-I SERIES

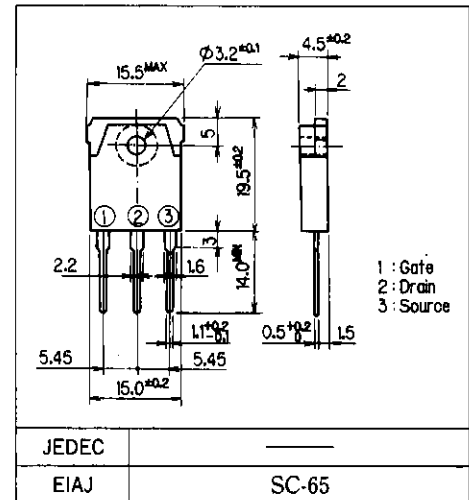
Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage

Applications

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

Outline Drawings

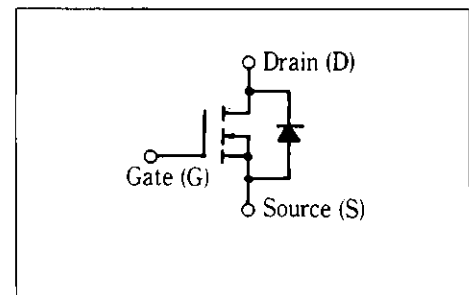


Max. Ratings and Characteristics

Absolute Maximum Ratings(Tc=25°C)

Items	Symbols	Ratings	Units
Drain-source voltage	V _{DSS}	500	V
Continuous drain current	I _D	10	A
Pulsed drain current	I _{D(puls)}	40	A
Continuous reverse drain current	I _{DR}	10	A
Gate-source peak voltage	V _{GSS}	±20	V
Max. power dissipation	P _D	100	W
Operating and storage temperature range	T _{ch}	150	°C
	T _{stg}	-55~+150	°C

Equivalent Circuit Schematic



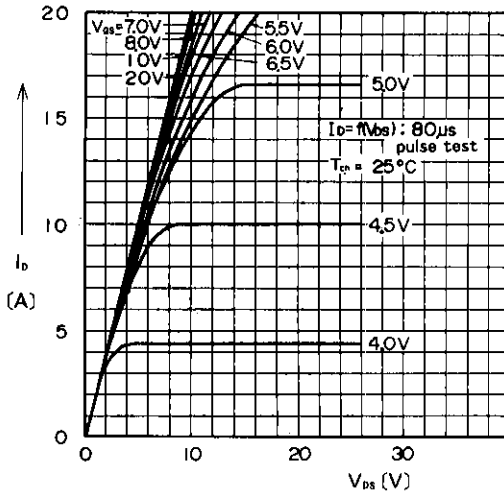
Electrical Characteristics(Tc=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	500			V
Gate threshold voltage	V _{GS(th)}	I _D =10mA V _{DS} =V _{GS}	2.1	3.0	4.0	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =500V V _{GS} =0V T _{ch} =25°C		10	500	μA
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 =5A V _{GS} =10V		0.5	0.67	Ω
Forward transconductance	g _{fs}	I _D =5A V _{DS} =25V	6.0	10.0		S
Input capacitance	C _{iss}	V _{DS} =25V		1600	2400	pF
Output capacitance	C _{oss}	V _{GS} =0V		200	300	
Reverse transfer capacitance	C _{rss}	f=1MHz		80	120	
Switching time (t _{off} =t _{d(off)} +t _f)	t _{on}	V _{CC} =30V R _G =50Ω		130	195	ns
	t _{d(off)}	I _D =2.8A		330	430	
	t _f	V _{GS} =10V		110	140	
Diode forward on-voltage	V _{SD}	I _F =2×I _{DR} V _{GS} =0V T _{ch} =25°C		1.1	1.7	V
Reverse recovery time	t _{rr}	I _F =I _{DR} di/dt=100A/μs T _{ch} =25°C		500		ns

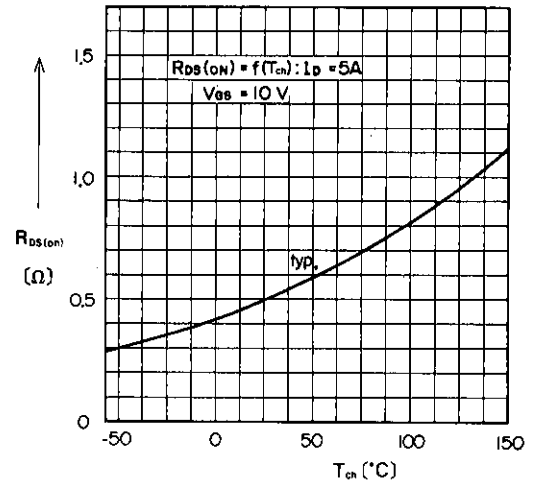
Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(ch-a)}	channel to air			35	°C/W
	R _{th(ch-c)}	channel to case			1.25	°C/W

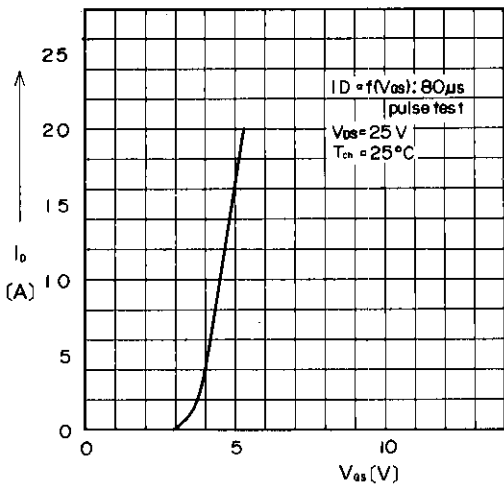
■ Characteristics



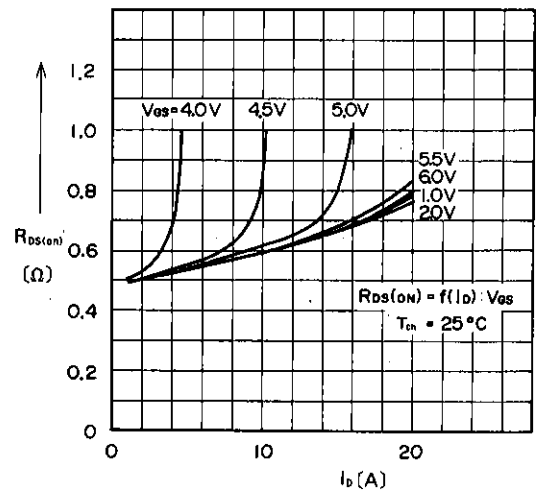
Typical Output Characteristics



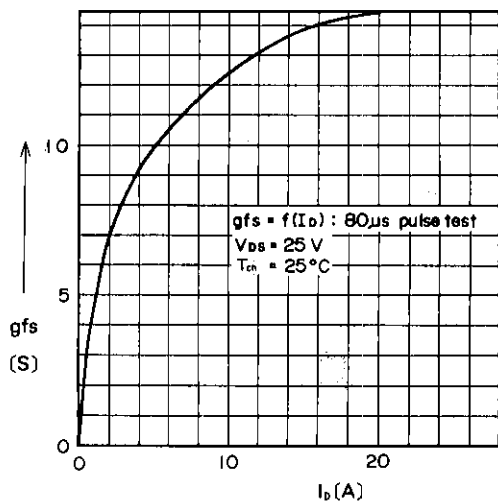
On State Resistance vs. T_{ch}



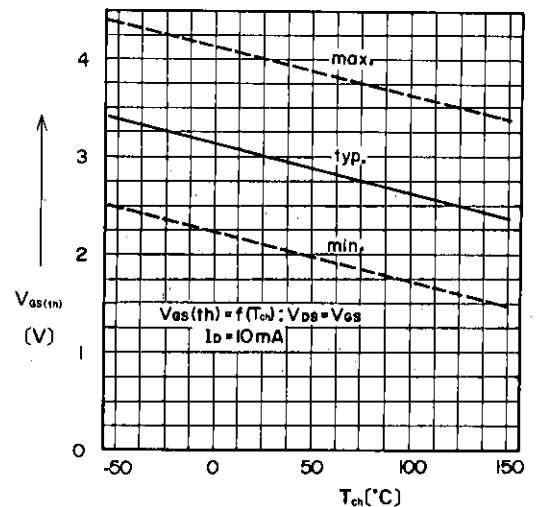
Typical Transfer Characteristic



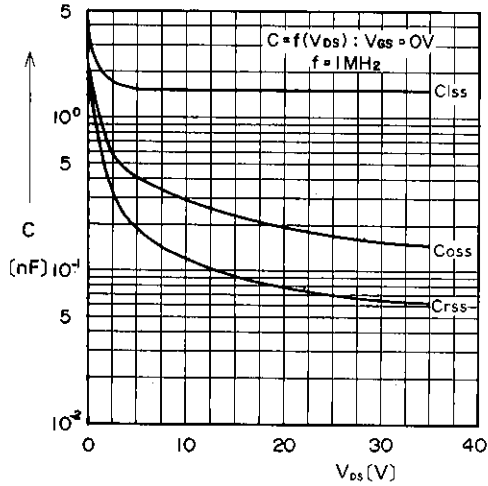
Typical Drain-Source on State Resistance vs. I_D



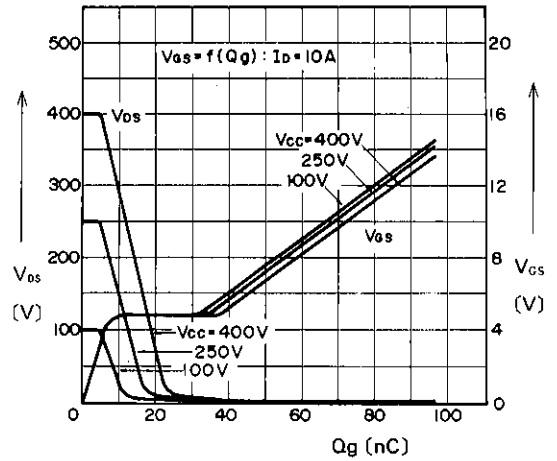
Typical Forward Transconductance vs. I_D



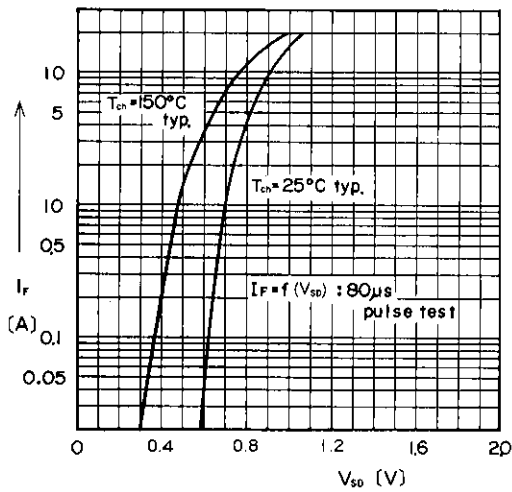
Gate Threshold Voltage vs. T_{ch}



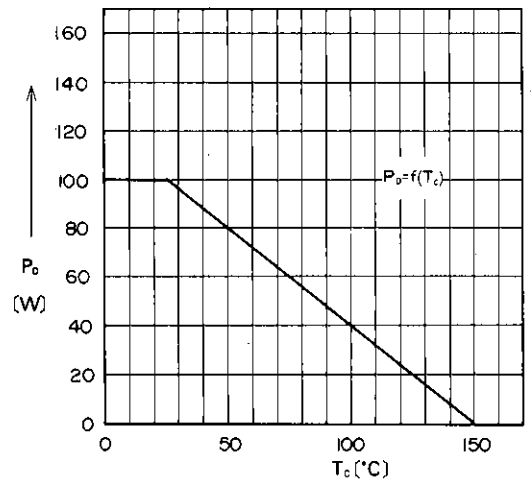
Typical Capacitance vs. V_{gs}



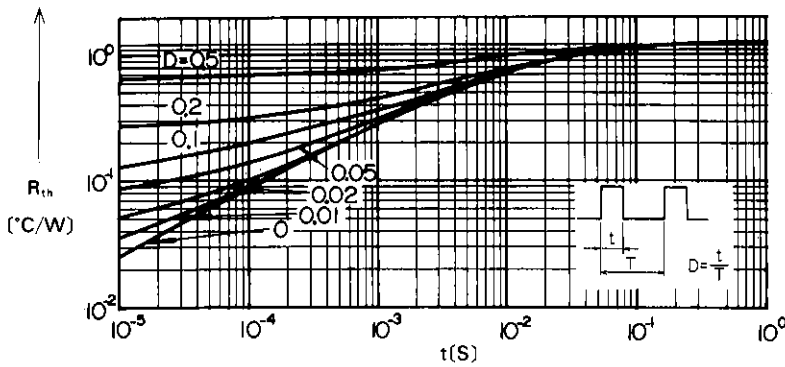
Typical Input Charge



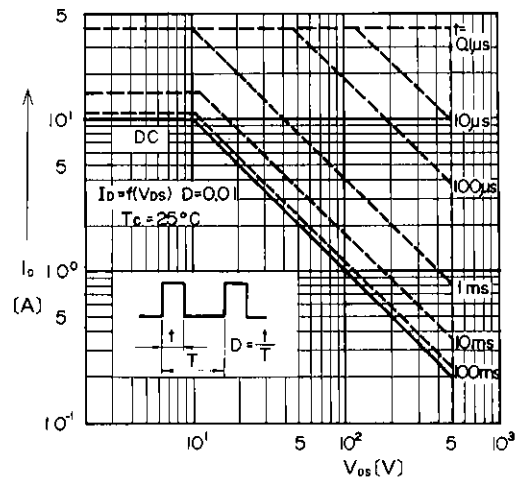
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T_c



Transient Thermal Impedance



Safe Operating Area