

N-CHANNEL SILICON POWER MOS-FET

F-I SERIES

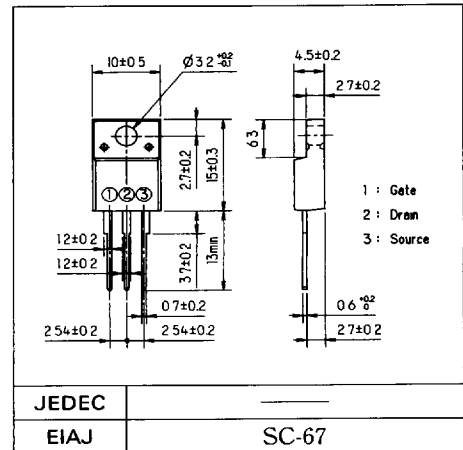
Features

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

Applications

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

Outline Drawings

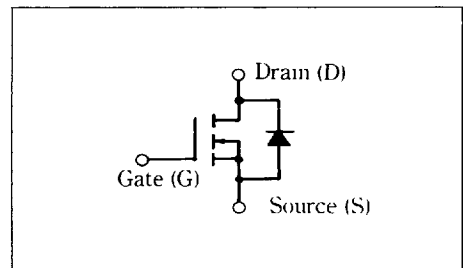


Max. Ratings and Characteristics

Absolute Maximum Ratings(Tc=25°C)

Items	Symbols	Ratings	Units
Drain-source voltage	V_{DS}	250	V
Continuous drain current	I_D	12	A
Pulsed drain current	$I_{D(puls)}$	48	A
Continuous reverse drain current	I_{DR}	12	A
Gate-source peak voltage	V_{GSS}	±20	V
Max. power dissipation	P_D	40	W
Operating and storage temperature range	T_{ch} T_{stg}	150 -55~+150	°C

Equivalent Circuit Schematic



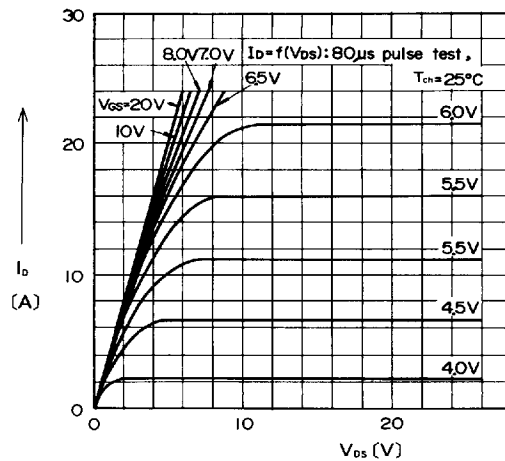
Electrical Characteristics(Tc=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1mA$ $V_{GS} = 0V$	250			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}	$V_{DS} = 250V$ $V_{GS} = 0V$ $T_{ch} = 25°C$		10	500	μA
		$T_{ch} = 125°C$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS} = \pm 20V$ $V_{DS} = 0V$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 6A$ $V_{GS} = 10V$		0.25	0.30	Ω
Forward transconductance	g_{fs}	$I_D = 6A$ $V_{DS} = 25V$	4.0	9.0		S
Input capacitance	C_{iss}	$V_{DS} = 25V$		1200	1800	pF
Output capacitance	C_{oss}	$V_{GS} = 0V$		200	300	
Reverse transfer capacitance	C_{rss}	$f = 1MHz$		60	90	
Turn-on time t_{on} ($t_{on} + t_{d(on)} + t_r$)	$t_{d(on)}$	$V_{CC} = 30V$ $I_D = 3A$ $V_{GS} = 10V$ $R_G = 50Ω$		25	40	ns
	t_r			50	80	
Turn-off time t_{off} ($t_{d(off)} + t_f$)	$t_{d(off)}$			200	300	
	t_f			60	90	
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25°C$		1.1	1.5	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$ $dI/dt = 100A/\mu s$ $T_{ch} = 25°C$		150		ns

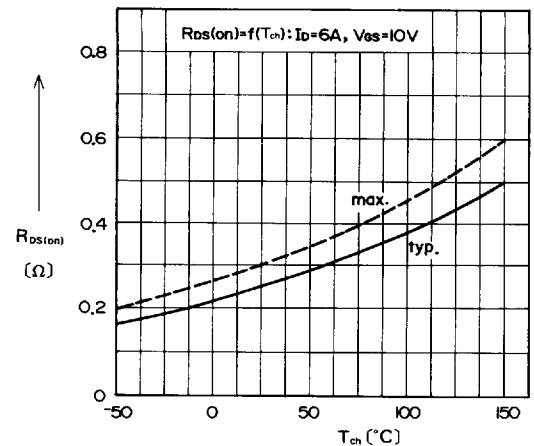
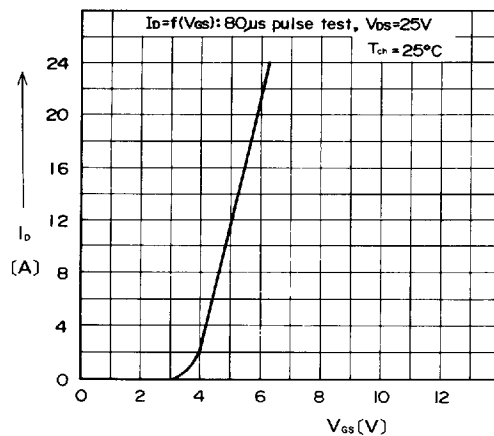
Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(ch-a)}$	channel to air			62.5	°C/W
	$R_{th(ch-c)}$	channel to case			3.125	°C/W

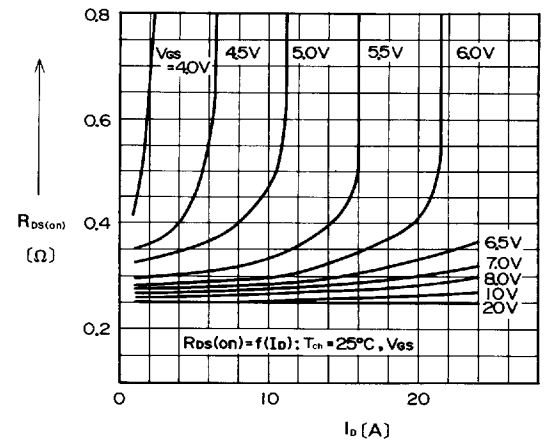
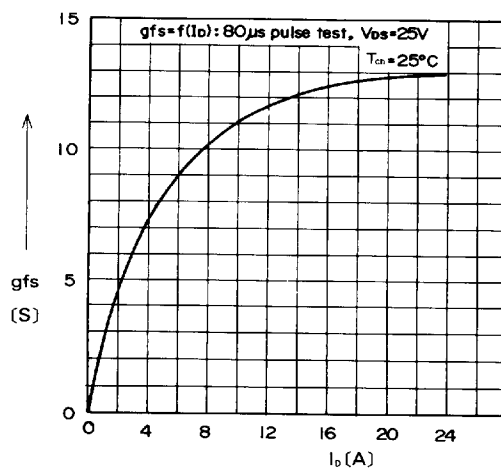
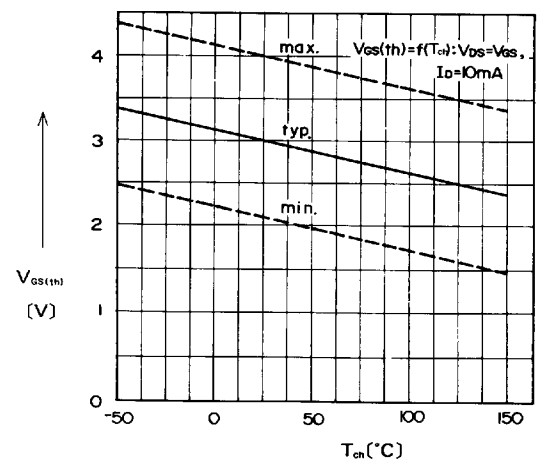
Characteristics

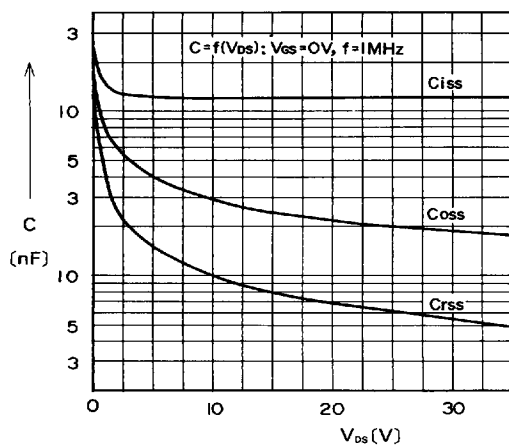
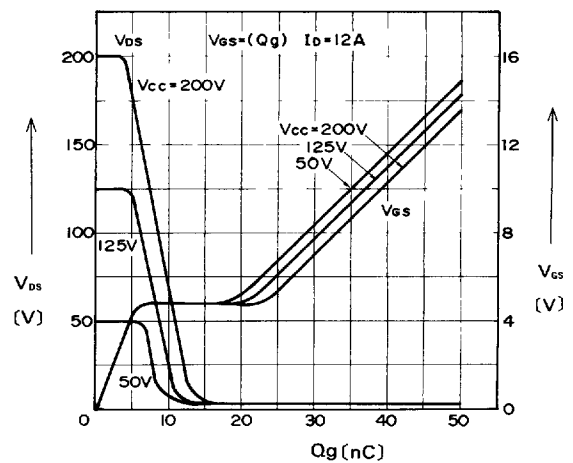


Typical Output Characteristics

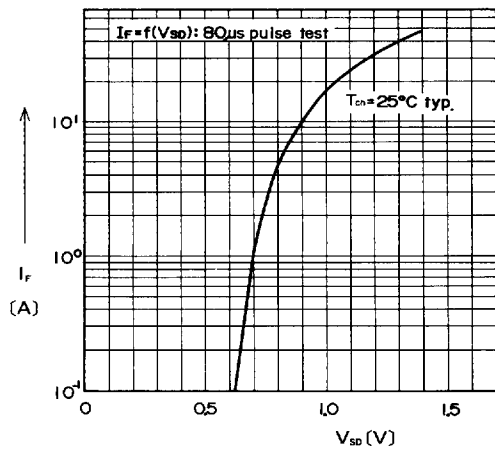
On State Resistance vs. T_{ch} 

Typical Transfer Characteristic

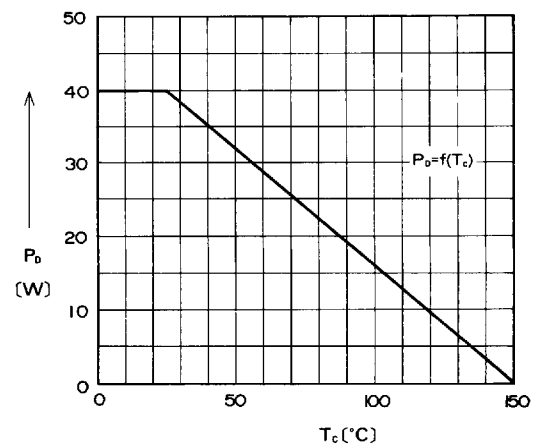
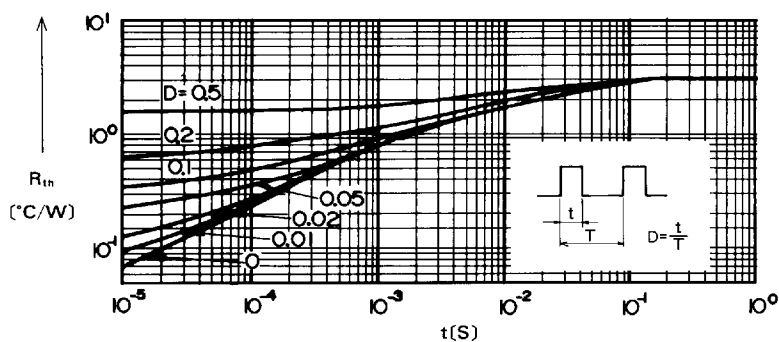
Typical Drain-Source on State Resistance vs. I_D Typical Forward Transconductance vs. I_D Gate Threshold Voltage vs. T_{ch}

Typical Capacitance vs. V_{DS} 

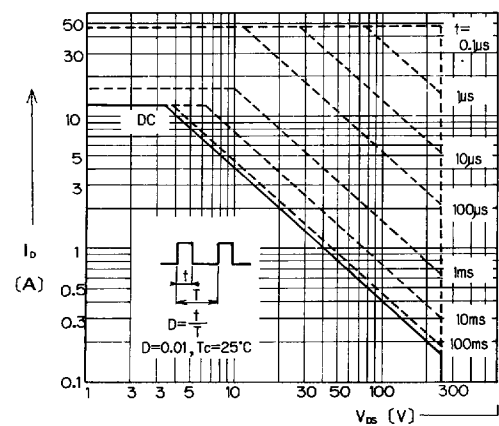
Typical Input Charge



Forward Characteristic of Reverse Diode

Allowable Power Dissipation vs. T_c 

Transient Thermal Impedance



Safe Operating Area