

N-CHANNEL SILICON POWER MOS-FET

FAP-II SERIES

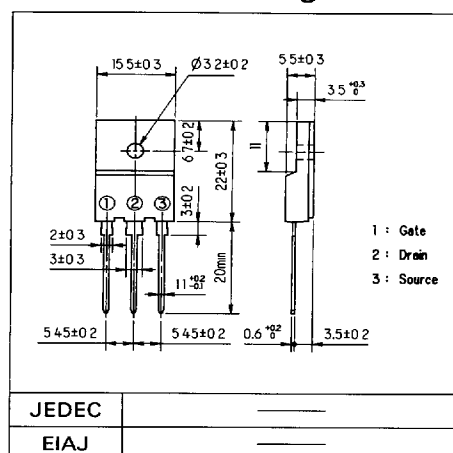
Features

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

Applications

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

Outline Drawings

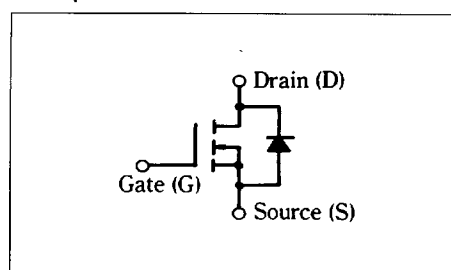


Max. Ratings and Characteristics

- Absolute Maximum Ratings($T_c = 25^\circ C$)
(unless otherwise specified)

Items	Symbols	Ratings	Units
Drain-source voltage	V_{DS}	450	V
Drain-gate voltage ($R_{GS} = 20K\Omega$)	V_{DGR}	450	V
Continuous drain current	I_D	18	A
Pulsed drain current	$I_{D(Puls)}$	44	A
Gate-source voltage	V_{GS}	± 30	V
Max. power dissipation	P_D	80	W
Operating and storage temperature range	T_{ch} T_{stg}	150 $-55 \sim +150$	$^\circ C$ $^\circ C$

Equivalent Circuit Schematic



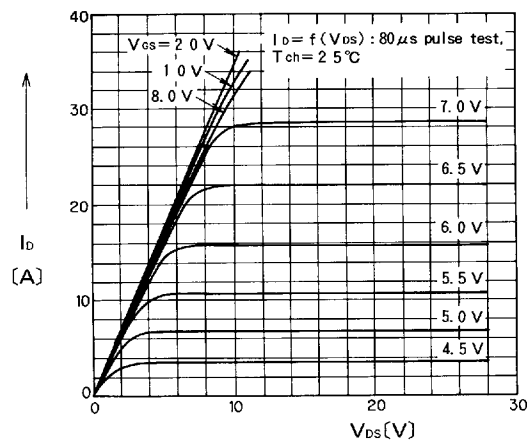
- Electrical Characteristics($T_c = 25^\circ C$) (unless otherwise specified)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1mA$ $V_{GS} = 0V$	450			V
Gate threshold voltage	$V_{GS(th)}$	$I_D = 1mA$ $V_{DS} = V_{GS}$	2.5	3.5	5.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 450V$ $T_{ch} = 25^\circ C$ $V_{GS} = 0V$ $T_{ch} = 125^\circ C$		10 0.2	500 1.0	μA mA
Gate-source leakage current	I_{GSS}	$V_{GS} = \pm 30V$ $V_{DS} = 0V$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 8A$ $V_{GS} = 10V$		0.30	0.45	Ω
Forward transconductance	g_{fs}	$I_D = 8A$ $V_{DS} = 25V$	5	10		S
Input capacitance	C_{iss}	$V_{DS} = 25V$		1800	2700	pF
Output capacitance	C_{oss}	$V_{GS} = 0V$		270	410	
Reverse transfer capacitance	C_{rss}	$f = 1MHz$		120	185	
Turn-on time t_{on} ($t_{on} = t_{d(on)} + t_r$)	$t_{d(on)}$ t_r	$V_{CC} = 300V$ $I_D = 18A$ $V_{GS} = 10V$		70 100	110 150	ns
Turn-off time t_{off} ($t_{off} = t_{d(off)} + t_f$)	$t_{d(off)}$ t_f	$R_{GS} = 25\Omega$		250 80	380 120	
Continuous reverse drain current	I_{DR}				18	A
Pulsed reverse drain current	I_{DRM}				44	A
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$		1.18	1.70	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$ $V_{GS} = 0V$		400		ns
Reverse recovery charge	Q_{rr}	$-dI_F/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$		4.0		μC

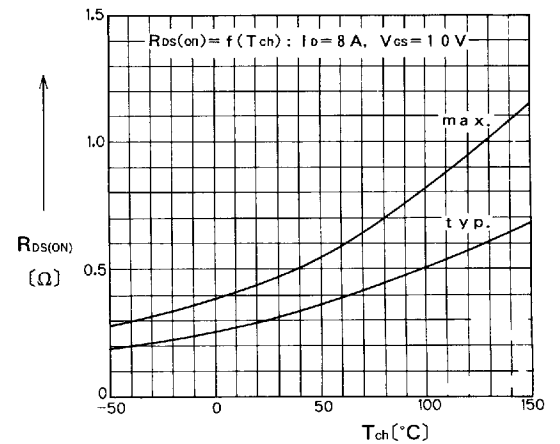
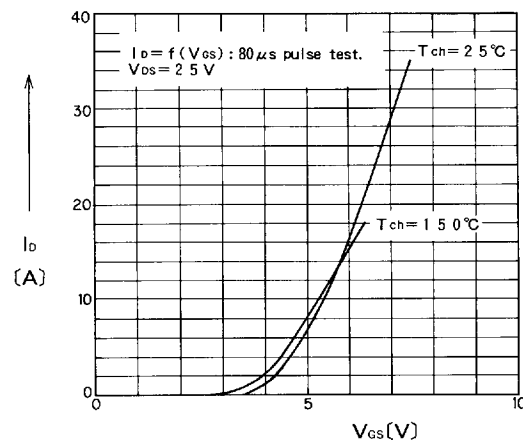
Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to air			30.0	$^\circ C/W$
	$R_{th(ch-c)}$	channel to case			1.56	$^\circ C/W$

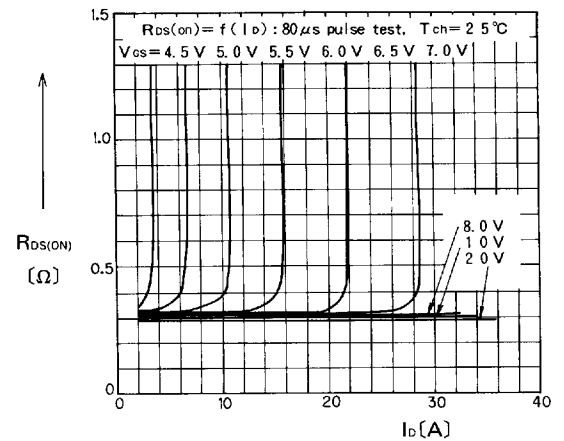
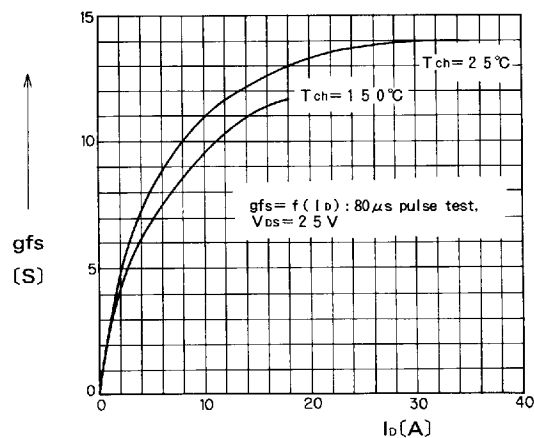
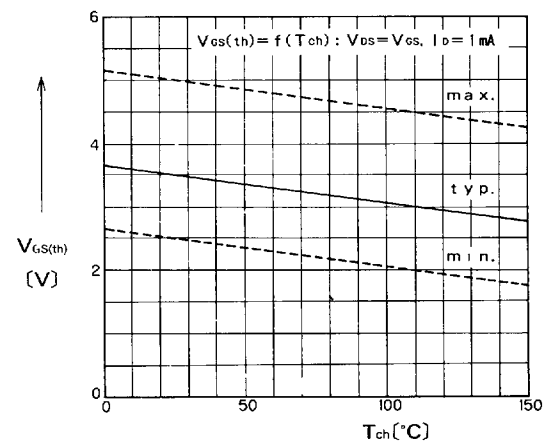
■ Characteristics



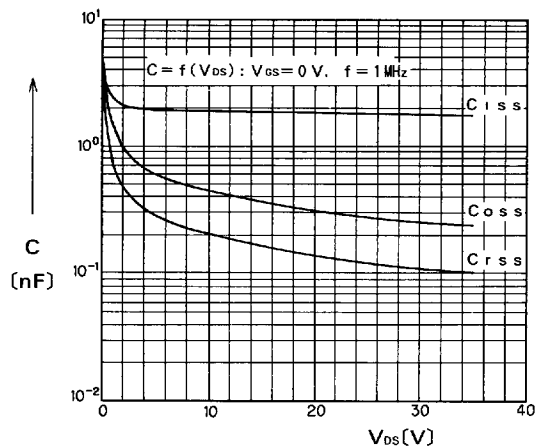
Typical Output Characteristics

Drain-Source on-State Resistance vs. T_{ch} 

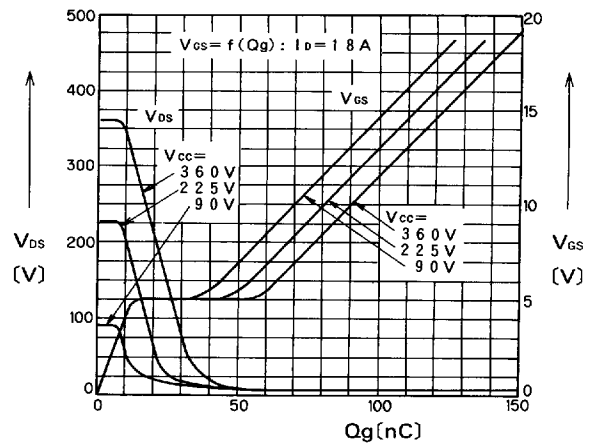
Typical Transfer Characteristics

Typical Drain-Source on-State Resistance vs. I_D Typical Forward Transconductance vs. I_D 

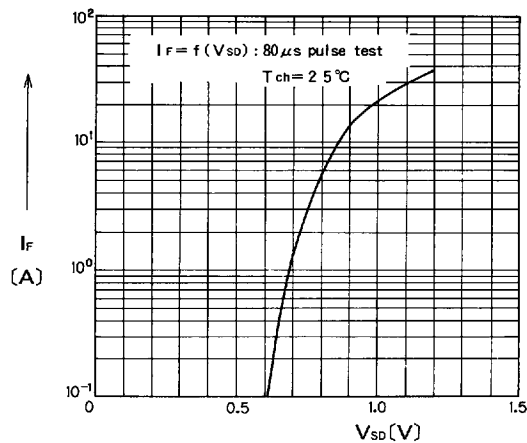
Gate Threshold Voltage



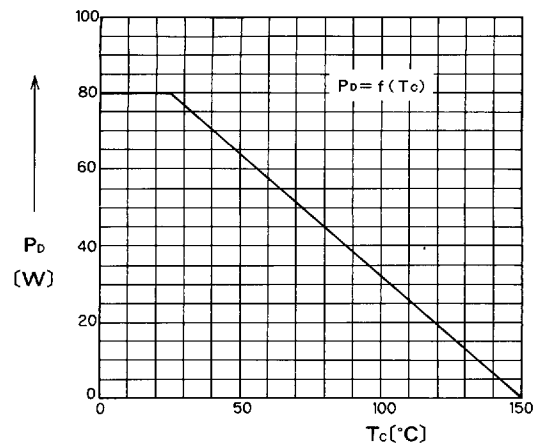
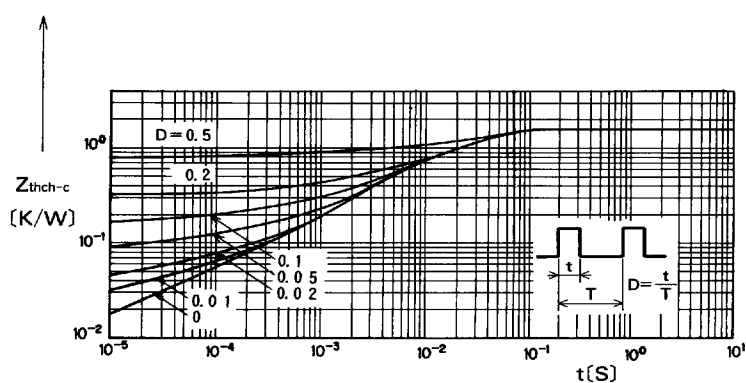
Typical Capacitances



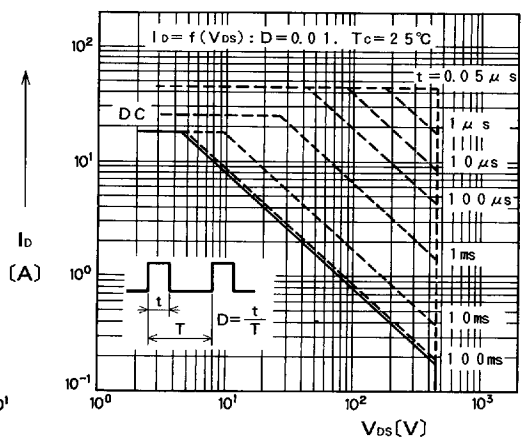
Typical Input Charge



Forward Characteristics of Reverse Diode

Power Dissipation vs. T_C 

Transient Thermal Impedance



Safe Operating Area