

## N-CHANNEL SILICON POWER MOS-FET

## FAP-II SERIES

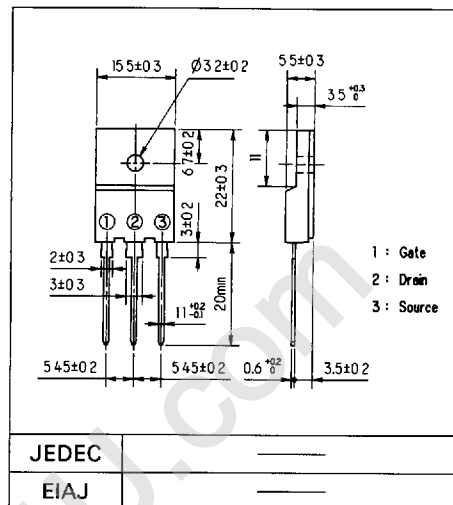
### ■ Features

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

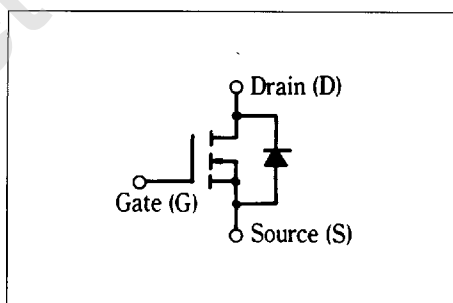
### ■ Applications

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

### ■ Outline Drawings



### ■ Equivalent Circuit Schematic



### ■ 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	$V_{GS}$	$\pm 30$	V
Max. power dissipation	$P_D$	80	W
Operating and storage temperature range	$T_{ch}$ $T_{stg}$	150 -55 ~ +150	$^\circ C$

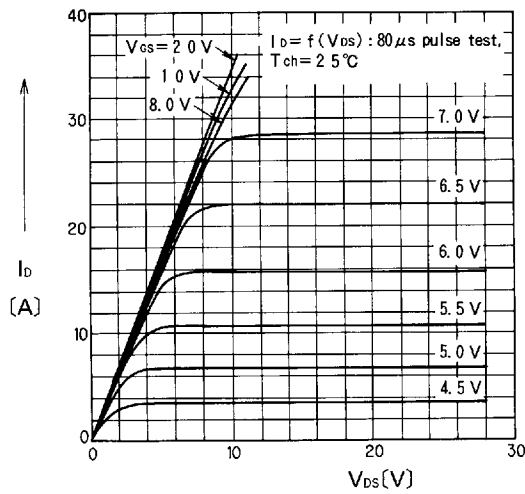
- Electrical Characteristics ( $T_c = 25^\circ C$ ) (unless otherwise specified)

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	$I_{DSS}$	$V_{DS} = 450V$ $V_{GS} = 0V$	$T_{ch} = 25^\circ C$	10	500	$\mu A$
			$T_{ch} = 125^\circ C$	0.2	1.0	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	$\Omega$
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 $t_{on}$ ( $t_{on} = t_{d(on)} + t_r$ )	$t_{d(on)}$	$V_{CC} = 300V$ $I_D = 18A$ $V_{GS} = 10V$ $R_{GS} = 25\Omega$		70	110	ns
	$t_r$			100	150	
Turn-off time $t_{off}$ ( $t_{off} = t_{d(off)} + t_f$ )	$t_{d(off)}$			250	380	ns
	$t_f$			80	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		$\mu C$

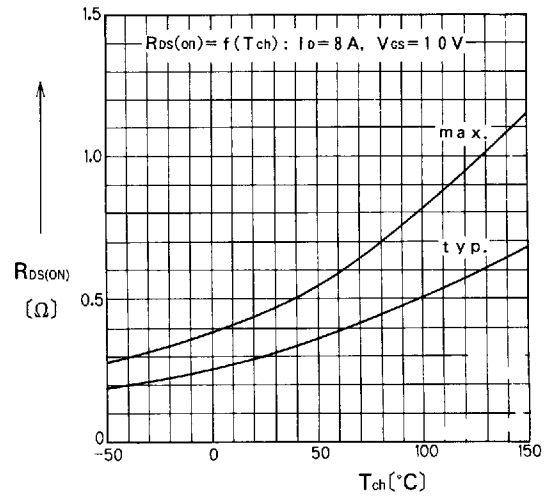
### ● Thermal Characteristics

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	$^\circ C/W$

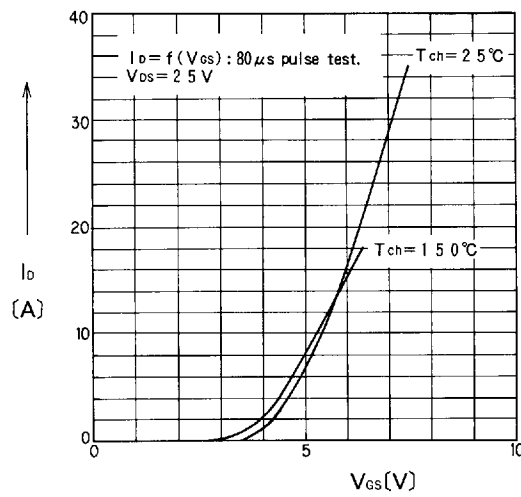
■ Characteristics



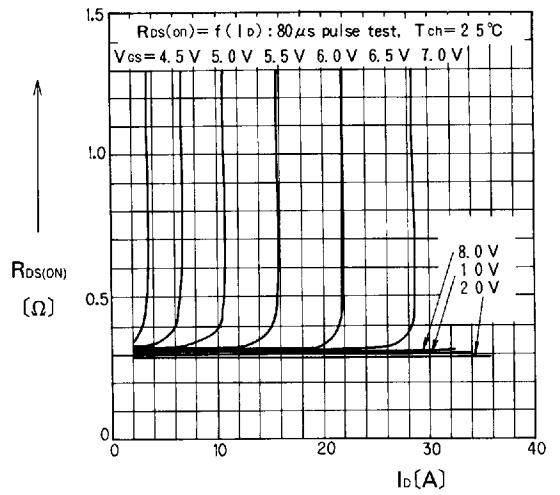
Typical Output Characteristics



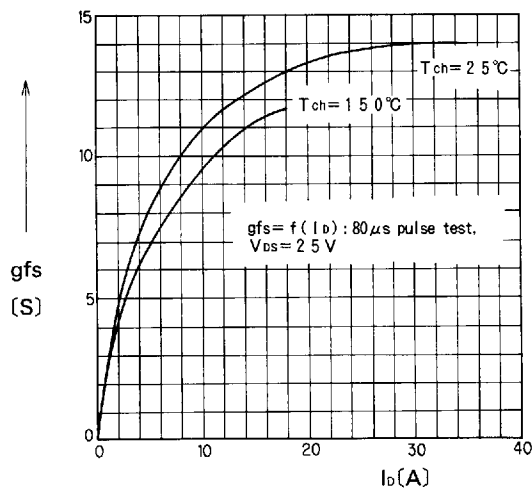
Drain-Source on-State Resistance vs.  $T_{ch}$



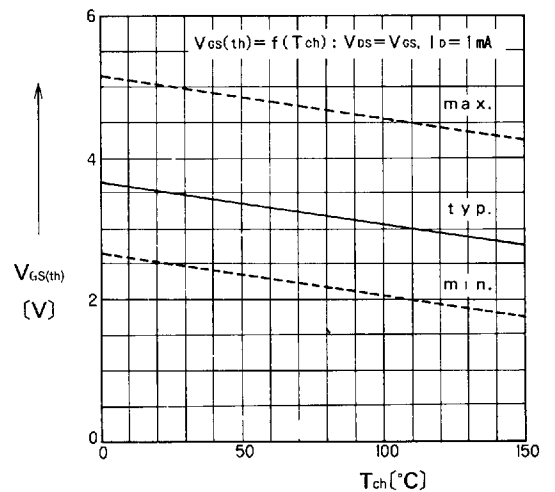
Typical Transfer Characteristics



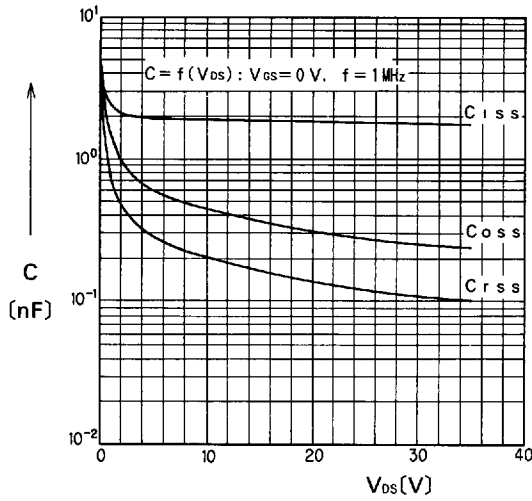
Typical Drain-Source on-State Resistance vs.  $I_D$



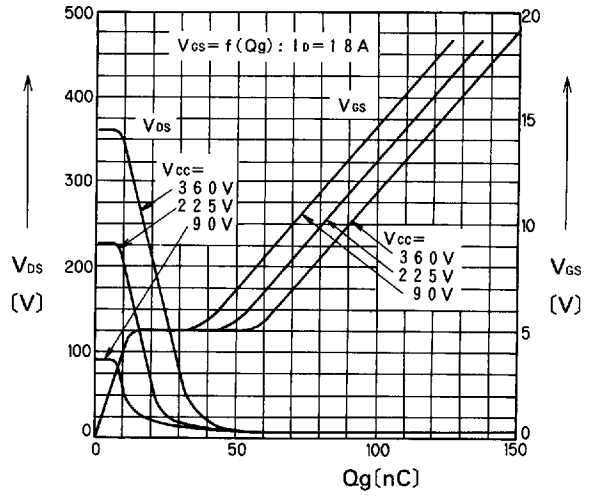
Typical Forward Transconductance vs.  $I_D$



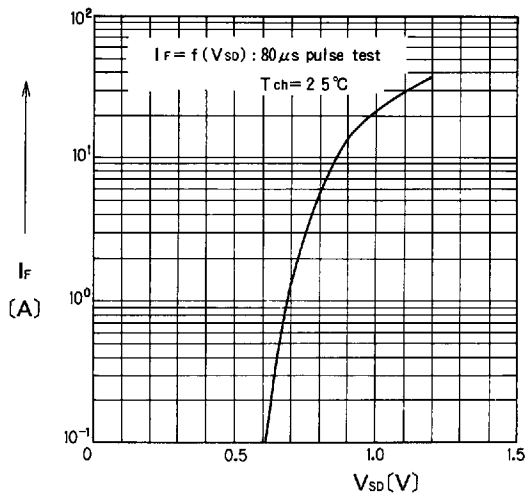
Gate Threshold Voltage



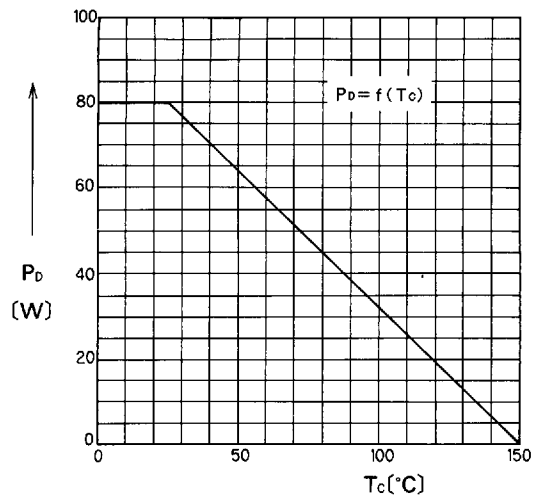
Typical Capacitances



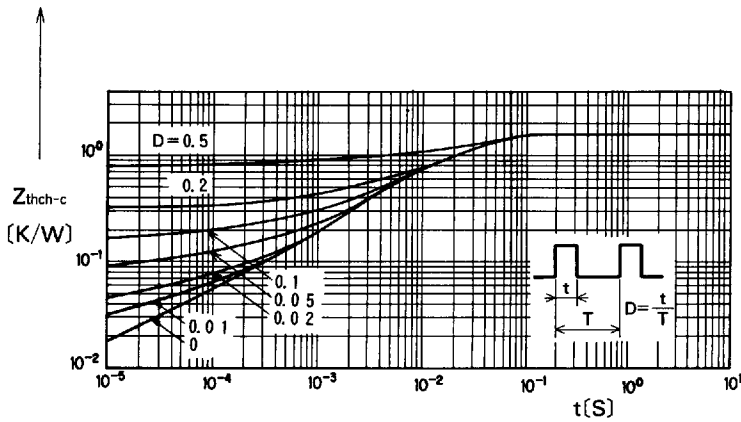
Typical Input Charge



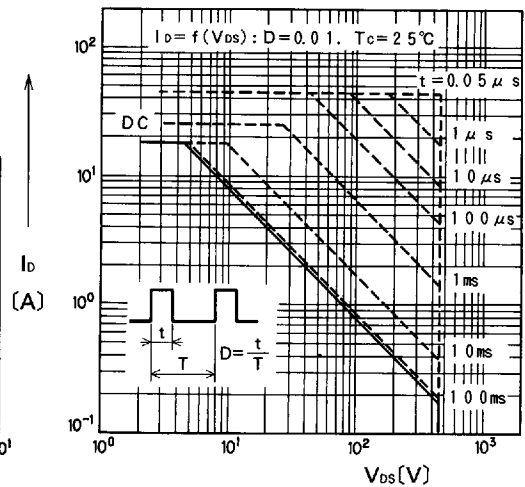
Forward Characteristics of Reverse Diode



Power Dissipation vs.  $T_c$



Transient Thermal Impedance



Safe Operating Area