

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

■ Max. Ratings and Characteristics

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

Items	Symbols	Ratings	Units
Drain-source voltage	V_{DS}	900	V
Drain-gate voltage ($R_{GS} = 20K\Omega$)	V_{DGR}	900	V
Continuous drain current	I_D	6	A
Pulsed drain current	$I_{D(puls)}$	18	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 ~ +150	$^\circ C$

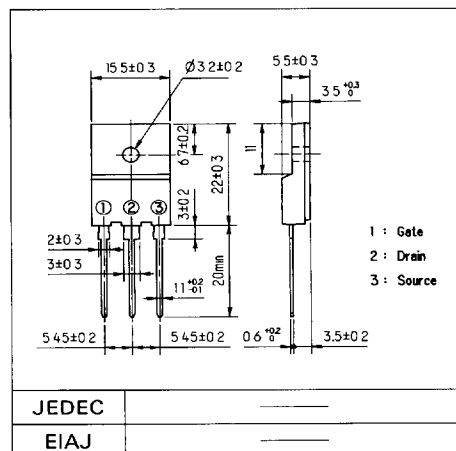
- Electrical Characteristics($T_c = 25^\circ C$) (unless otherwise specified)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1mA$ $V_{GS} = 0V$	900			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}	$V_{DS} = 900V$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$		10	500	μA
		$T_{ch} = 125^\circ C$		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	$R_{DS(on)}$	$I_D = 3A$ $V_{GS} = 10V$		2.1	2.8	Ω
Forward transconductance	g_{fs}	$I_D = 3A$ $V_{DS} = 25V$	2.0	4.5		S
Input capacitance	C_{iss}	$V_{DS} = 25V$		1200	1800	pF
Output capacitance	C_{oss}	$V_{GS} = 0V$		140	210	
Reverse transfer capacitance	C_{rss}	$f = 1MHz$		50	75	
Turn-on time t_{on} ($t_{on} = t_{d(on)} + t_r$)	$t_{d(on)}$ t_r	$V_{CC} = 600V$ $I_D = 3A$ $V_{GS} = 10V$		35 110	55 170	ns
Turn-off time t_{off} ($t_{off} = t_{d(off)} + t_f$)	$t_{d(off)}$ t_f	$R_{GS} = 25\Omega$		150 100	230 150	
Avalanche capability	I_{AV}	$L = 100\mu H$ $T_{ch} = 25^\circ C$	6			A
Continuous reverse drain current	I_{DR}				6	A
Pulsed reverse drain current	I_{DRM}				18	A
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$		1.0	1.5	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$ $V_{GS} = 0V$		800		ns
Reverse recovery charge	Q_{rr}	$-dI_F/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$		5		μC

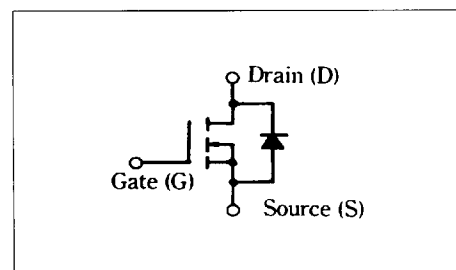
■ Thermal Characteristics

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

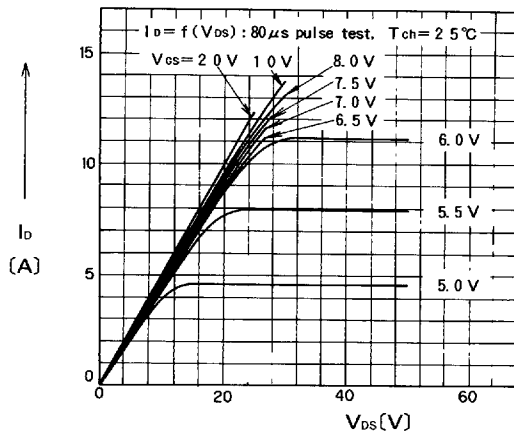
■ Outline Drawings



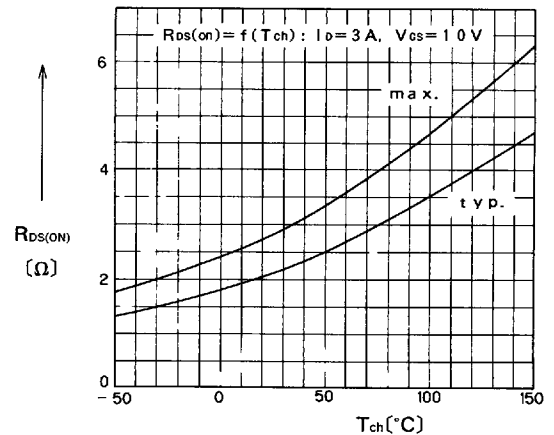
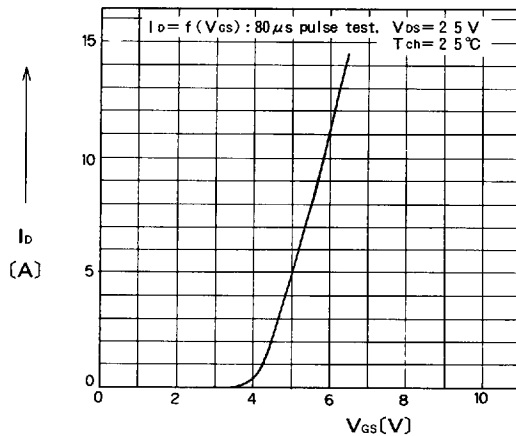
■ Equivalent Circuit Schematic



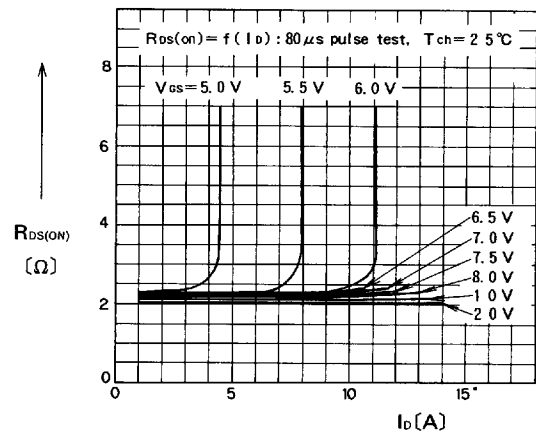
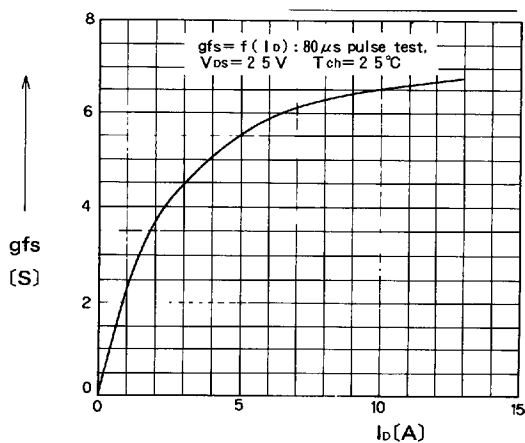
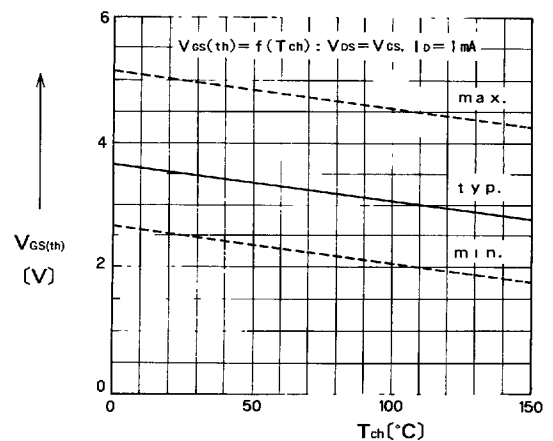
■ Characteristics

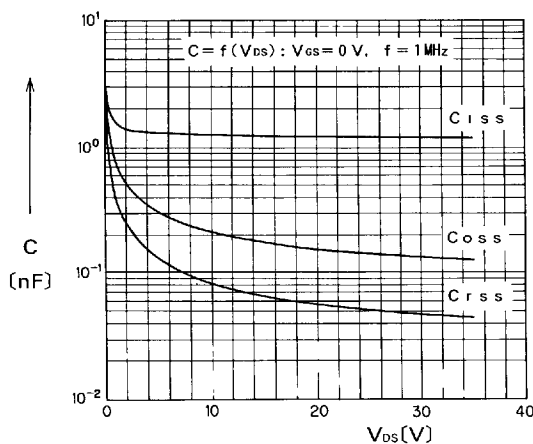
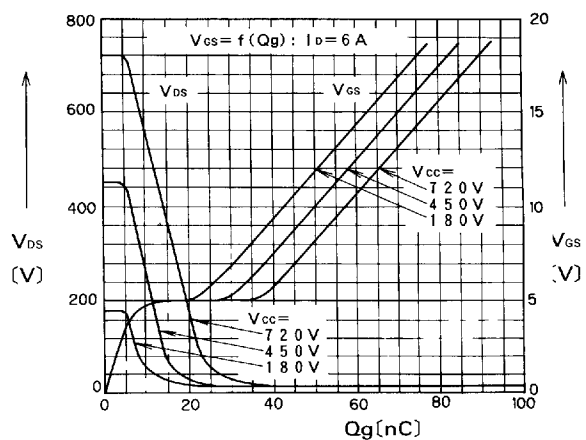


Typical Output Characteristics

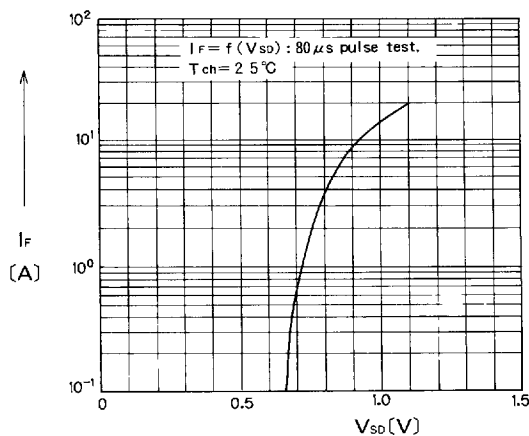
Drain-Source on-State Resistance vs. T_{ch} 

Typical Transfer Characteristics

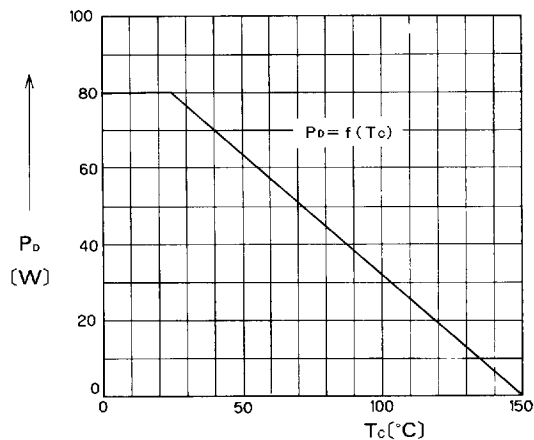
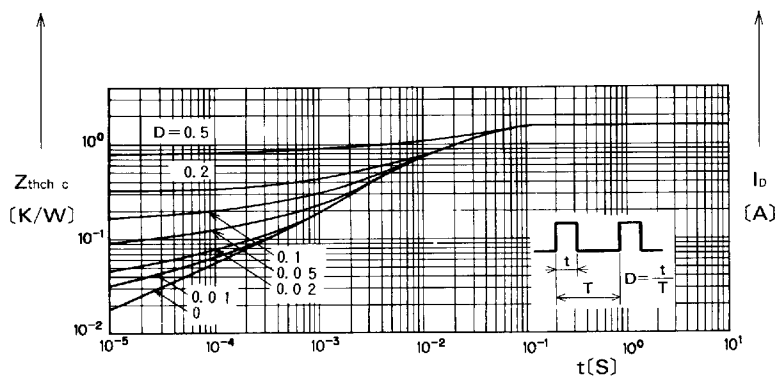
Typical Drain-Source on-State Resistance vs. I_D Typical Forward Transconductance vs. I_D Gate Threshold Voltage vs. T_{ch}

Typical Capacitance vs. V_{bs} 

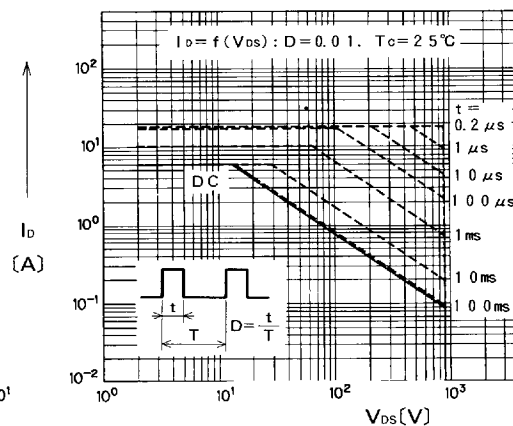
Typical Input Charge



Forward Characteristics of Reverse Diode

Allowable Power Dissipation vs. T_c 

Transient Thermal Impedance



Safe Operating Area