

## N-CHANNEL SILICON POWER MOS-FET

## F-II SERIES

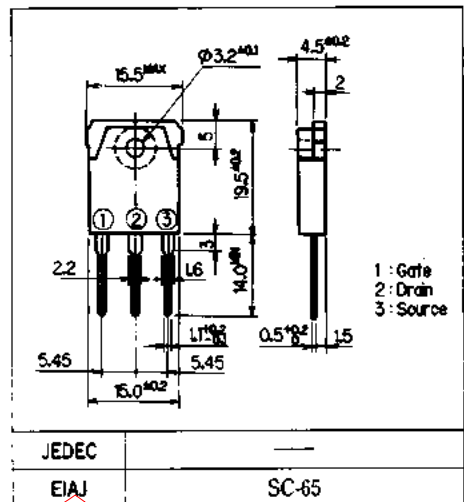
### Features

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

### Applications

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

### Outline Drawings

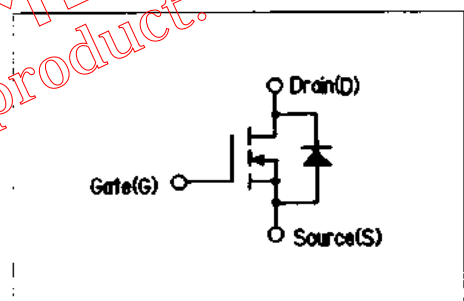


### Max. Ratings and Characteristics

#### Absolute Maximum Ratings( $T_c = 25^\circ C$ ):

Items	Symbols	Ratings	Units
Drain-source voltage	$V_{DSS}$	900	V
Continuous drain current	$I_D$	8	A
Pulsed drain current	$I_{D(puls)}$	23	A
Continuous reverse drain current	$I_{DR}$	8	A
Gate-source peak voltage	$V_{GSS}$	$\pm 30$	V
Max. power dissipation	$P_D$	150	W
Operating and storage temperature range	$T_{ch}$ $T_{stg}$	0.50 -55 ~ +150	$^\circ C$ $^\circ C$

### Equivalent Circuit Schematic



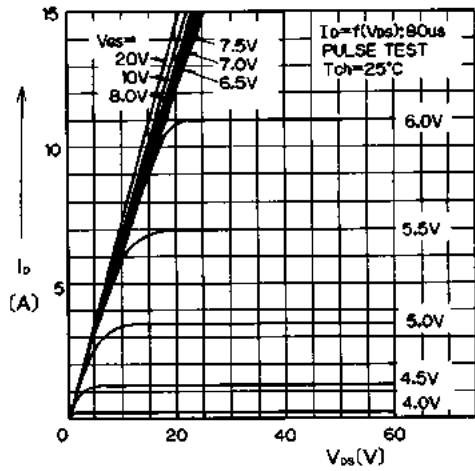
#### Electrical Characteristics( $T_c = 25^\circ C$ )

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	$\mu A$
		$T_{ch} = 125^\circ C$		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	$R_{DS(on)}$	$I_D = 4A$ $V_{GS} = 10V$		1.48	2.0	$\Omega$
Forward transconductance	$g_{fs}$	$I_D = 4A$ $V_{DS} = 25V$	3.0	6.0		S
Input capacitance	$C_{iss}$	$V_{DS} = 25V$		1400	2100	pF
Output capacitance	$C_{oss}$	$V_{GS} = 0V$		200	300	
Reverse transfer capacitance	$C_{rss}$	$f = 1MHz$		110	160	
Turn-on time $t_{on}$ ( $t_{on} + t_{d(on)} + t_r$ )	$t_{d(on)}$	$V_{CC} = 600V$ $I_D = 8A$ $V_{GS} = 10V$ $R_G = 25\Omega$		50	75	ns
	$t_r$			230	350	
	$t_f$			300	450	
Turn-off time $t_{off}$ ( $t_{d(off)} + t_f$ )	$t_{d(off)}$			160	240	
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	$t_{rr}$	$I_F = I_{DR}$ $dI/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$		1000		ns

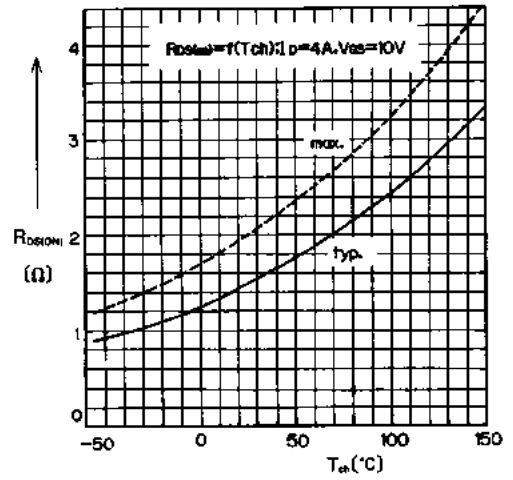
#### Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(ch-a)}$	channel to air			35.0	$^\circ C/W$
	$R_{th(ch-c)}$	channel to case			0.83	$^\circ C/W$

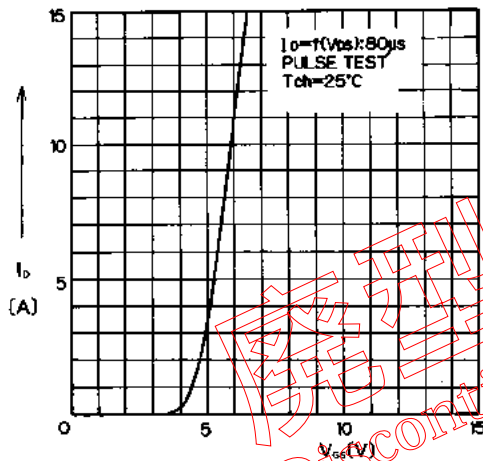
■ Characteristics



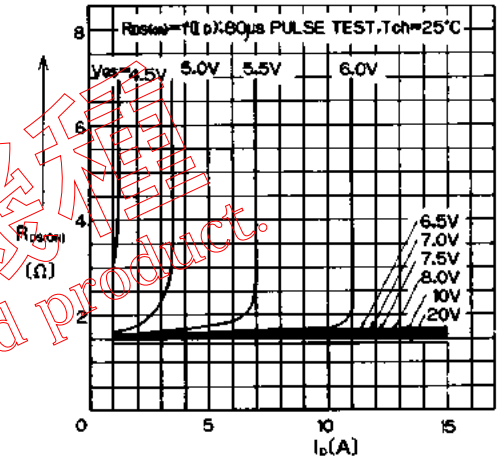
Typical Output Characteristics



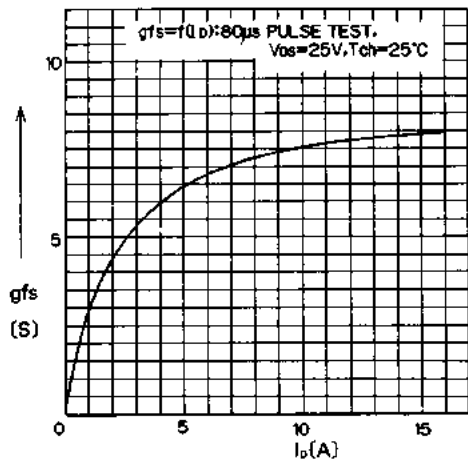
On State Resistance vs.  $T_{ch}$



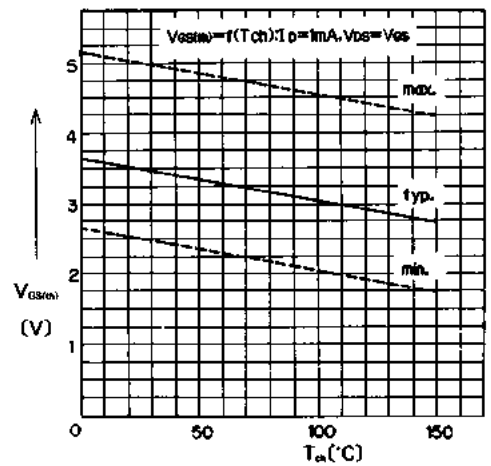
Typical Transfer Characteristics



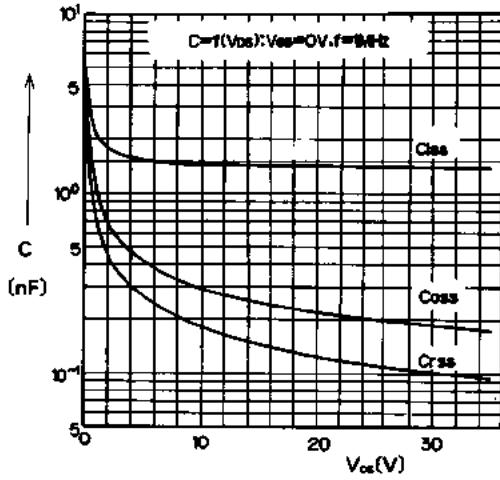
Typical Drain-Source on State Resistance vs.  $I_d$



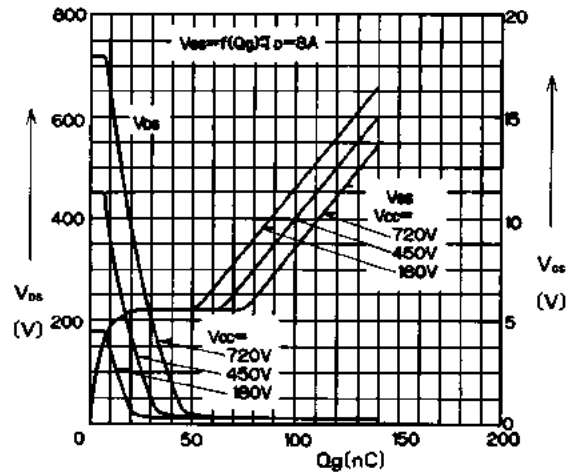
Typical Forward Transconductance vs.  $I_d$



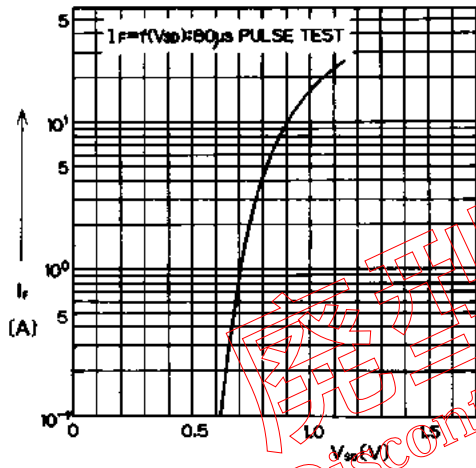
Gate Threshold Voltage vs.  $T_{ch}$



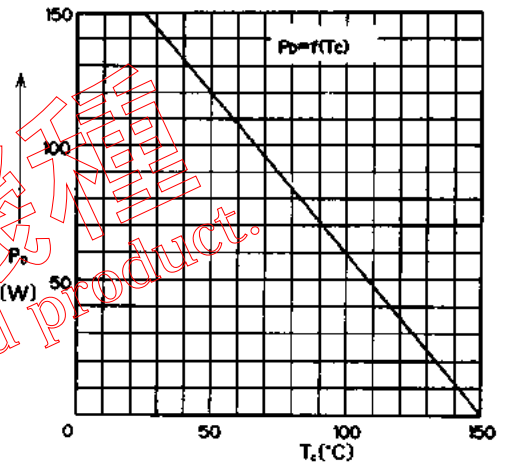
Typical Capacitance vs. V<sub>DS</sub>



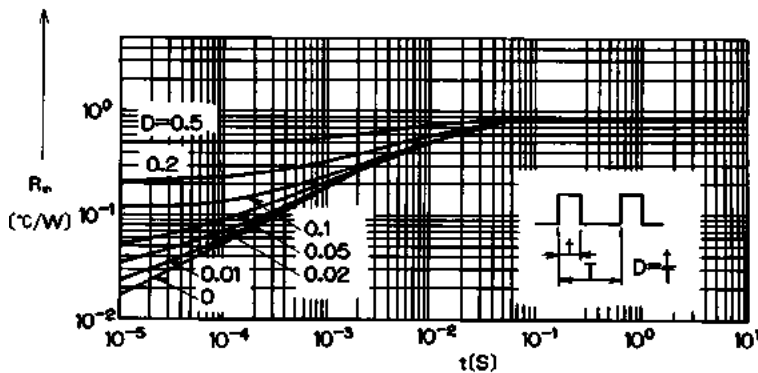
Typical Input Charge



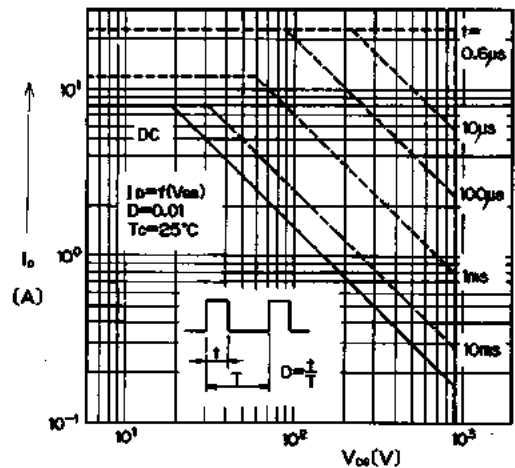
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T<sub>c</sub>



Transient Thermal Impedance



Safe Operating Area