

N-CHANNEL SILICON POWER MOSFET

F- II SERIES

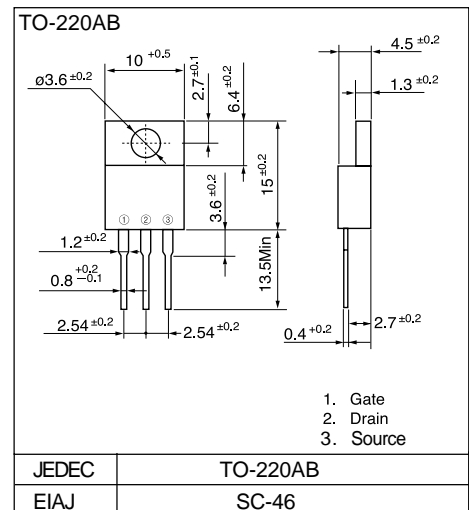
■ Features

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

■ Applications

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

■ Outline Drawings

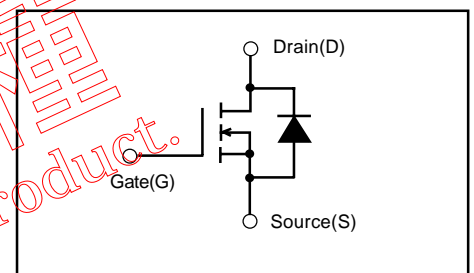


■ Maximum ratings and characteristics

● Absolute maximum ratings ($T_c=25^{\circ}C$ unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	250	V
Continuous drain current	I_D	10	A
Pulsed drain current	$I_{D(puls)}$	28	A
Continuous reverse drain current	I_{DR}	10	A
Gate-source peak voltage	V_{GS}	± 30	V
Max. power dissipation	P_D	80	W
Operating and storage temperature range	T_{ch} T_{stg}	$+150$ -55 to $+150$	$^{\circ}C$ $^{\circ}C$

■ Equivalent circuit schematic

● Electrical characteristics ($T_c=25^{\circ}C$ unless otherwise specified)

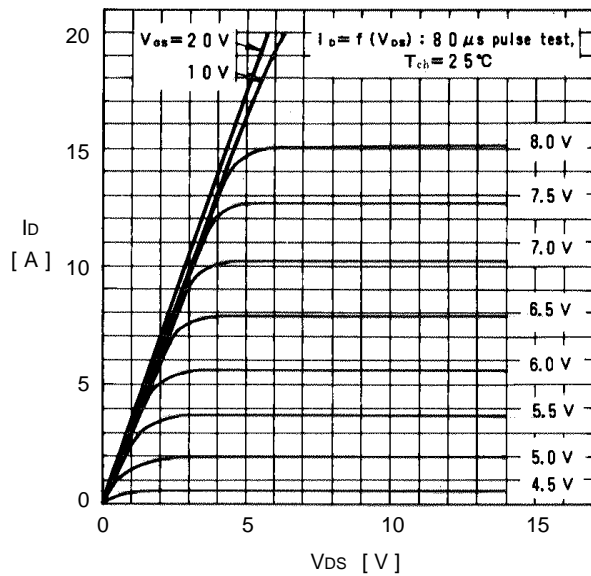
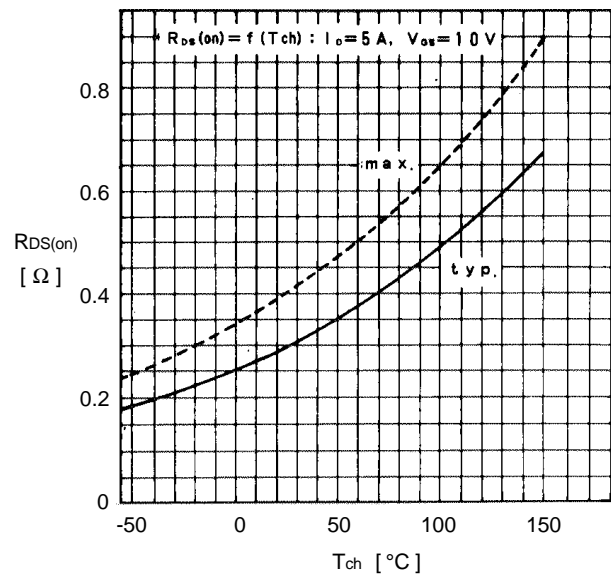
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0V$	250			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	2.5	3.5	5.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=250V$ $V_{GS}=0V$	$T_{ch}=25^{\circ}C$	10	500	μA
			$T_{ch}=125^{\circ}C$	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	$R_{DS(on)}$	$I_D=5.0A$ $V_{GS}=10V$		0.3	0.4	Ω
Forward transconductance	g_{fs}	$I_D=5.0A$ $V_{DS}=25V$	2.0	4.5		S
Input capacitance	C_{iss}	$V_{DS}=25V$		570	860	pF
Output capacitance	C_{oss}	$V_{GS}=0V$		140	210	pF
Reverse transfer capacitance	C_{rss}	$f=1MHz$		70	110	pF
Turn-on time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$t_{d(on)}$	$V_{CC}=150V$ $R_G=25\Omega$ $I_D=10A$		20	30	ns
	t_r			40	60	
Turn-off time t_{off} ($t_{off}=t_{d(off)}+t_f$)	$t_{d(off)}$	$V_{GS}=10V$		100	150	ns
	t_f			50	75	
Diode forward on-voltage	V_{SD}	$I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^{\circ}C$		1.12	1.68	V
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ $di/dt=100A/\mu s$ $T_{ch}=25^{\circ}C$		140		ns

● Thermal characteristics

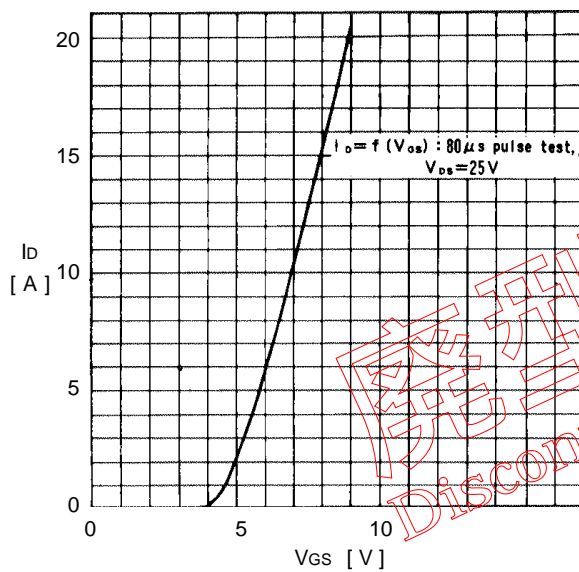
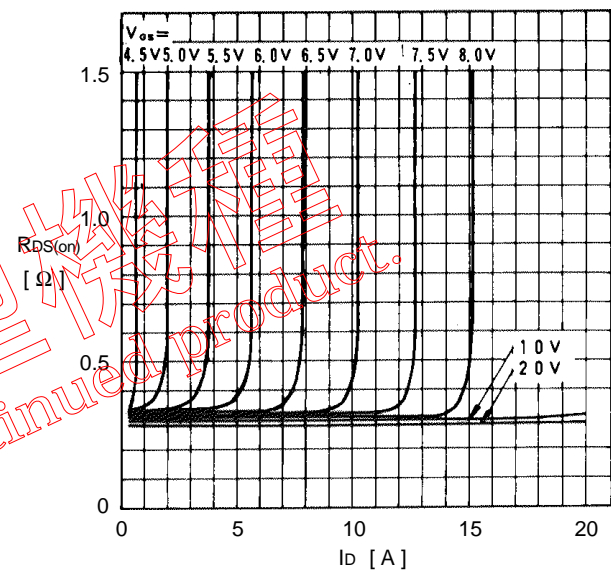
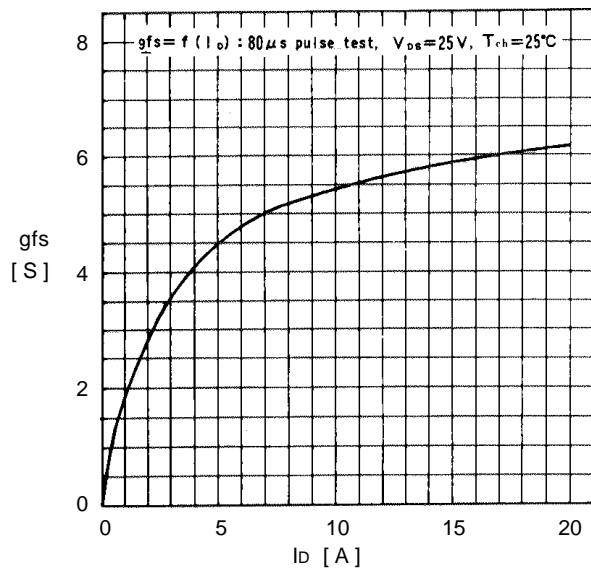
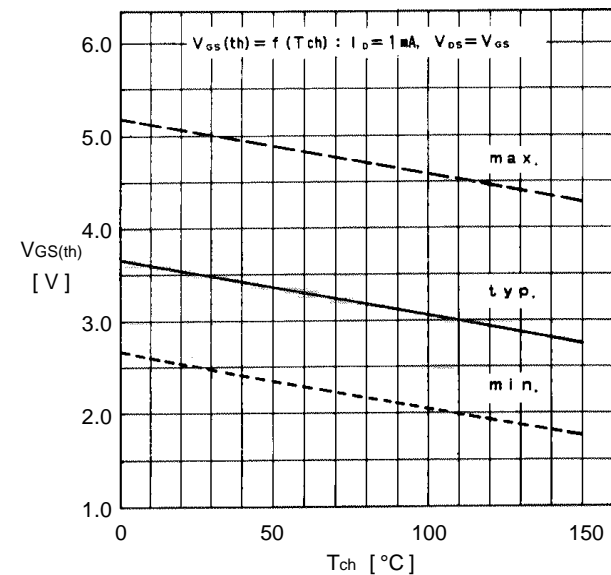
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to ambient			75.0	$^{\circ}C/W$
	$R_{th(ch-c)}$	channel to case			1.56	$^{\circ}C/W$

Characteristics

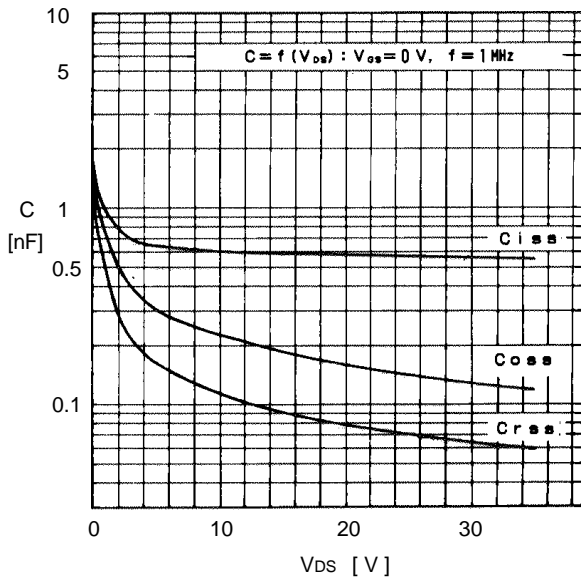
Typical output characteristics

On state resistance vs. T_{ch} 

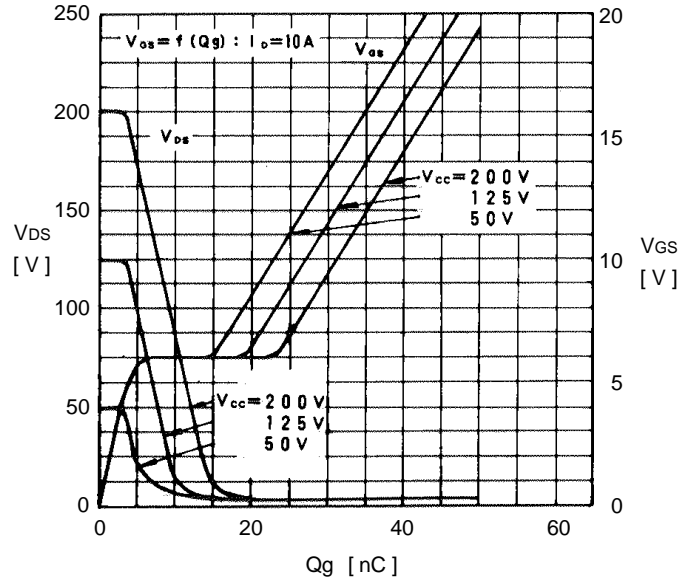
Typical transfer characteristics

Typical Drain-Source on state resistance vs. I_D Typical forward transconductance vs. I_D Gate threshold voltage vs. T_{ch} 

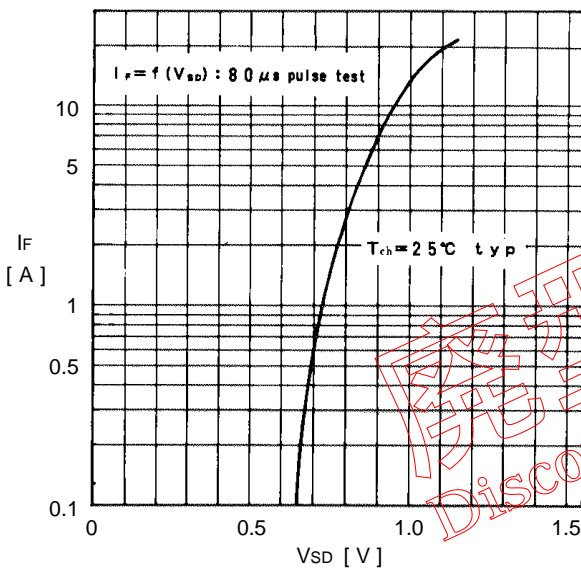
Typical capacitance vs. V_{DS}



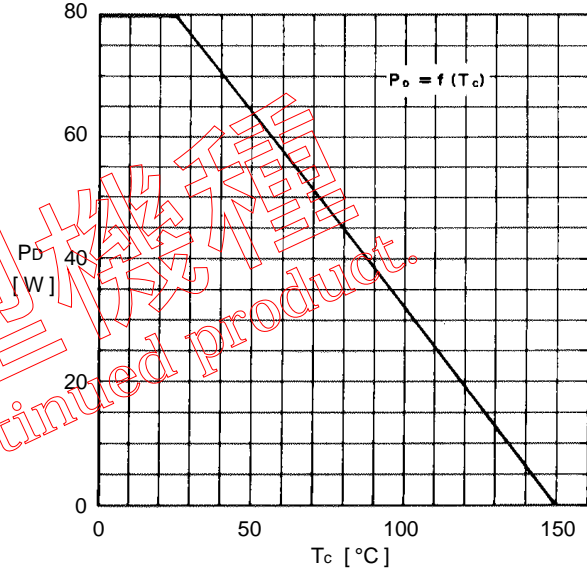
Typical input charge



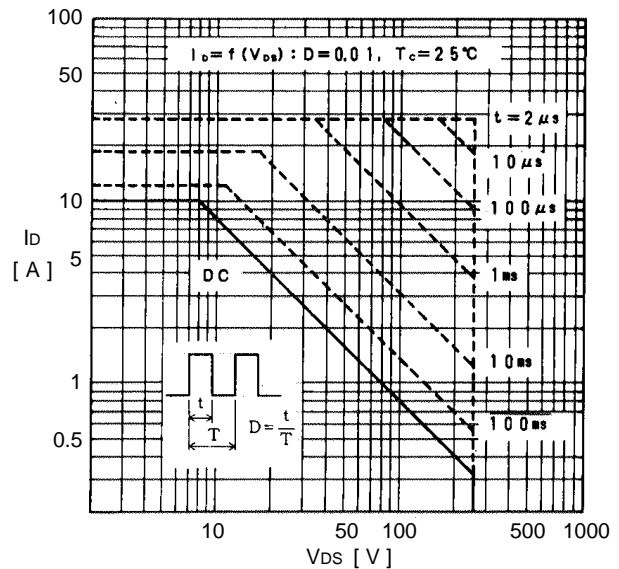
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Safe operating area



Transient thermal impedance

