

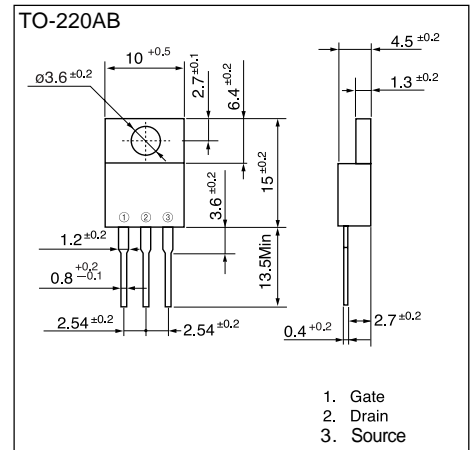
N-CHANNEL SILICON POWER MOS-FET

■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

■ Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters



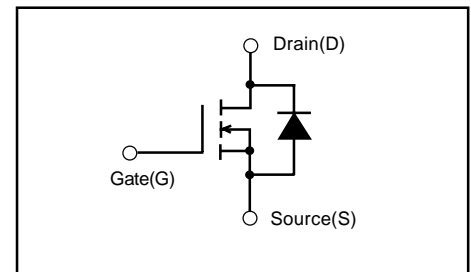
■ Maximum ratings and characteristic Absolute maximum ratings

● (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit	
Drain-source voltage	V _{DS}	100	V	
Continuous drain current	I _D	±50	A	
Pulsed drain current	I _{D(puls)}	±200	A	
Gate-source voltage	V _{GS}	±30	V	
Maximum Avalanche Energy	E _{AV*1}	464	mJ	
Max. power dissipation	T _a =25°C	P _D	1.67	W
	T _c =25°C	P _D	135	W
Operating and storage temperature range	T _{ch}	+150	°C	
	T _{stg}	-55 to +150	°C	

*1 L=298μH, V_{cc}=24V

■ Equivalent circuit schematic



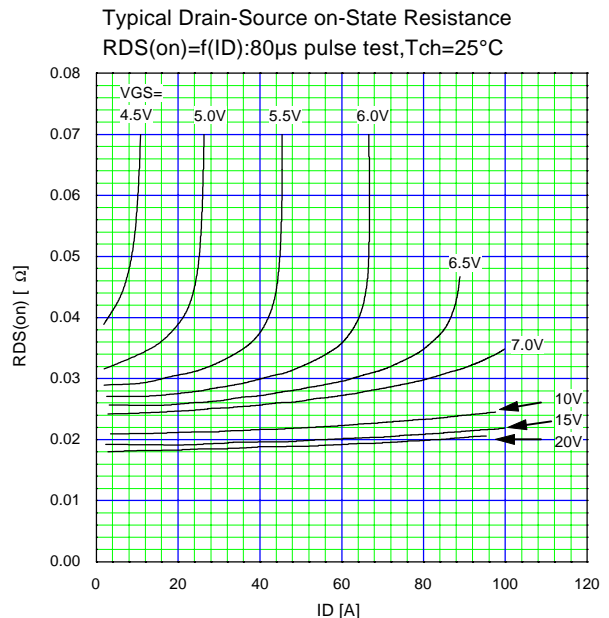
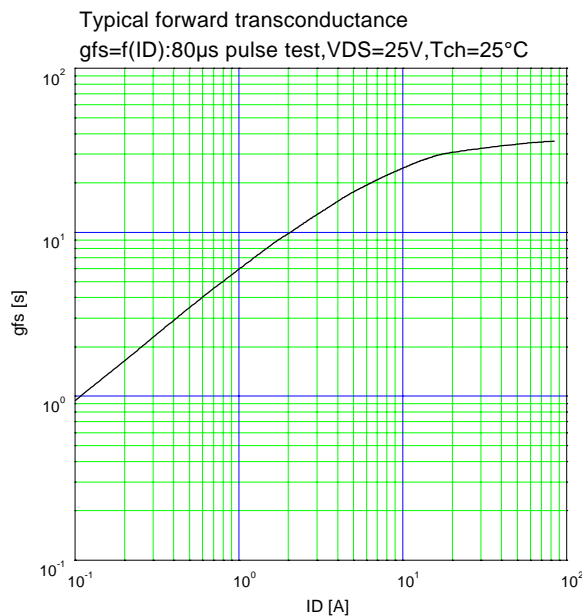
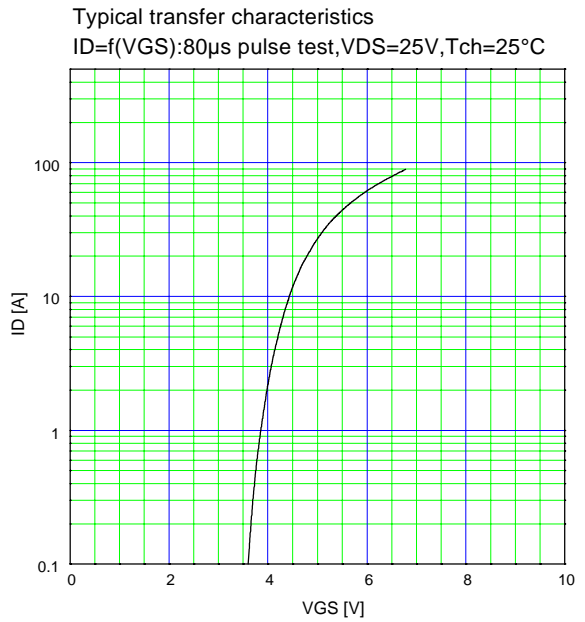
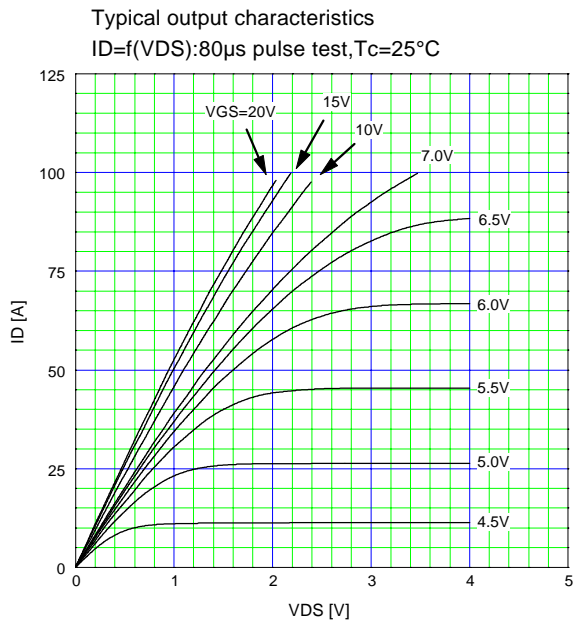
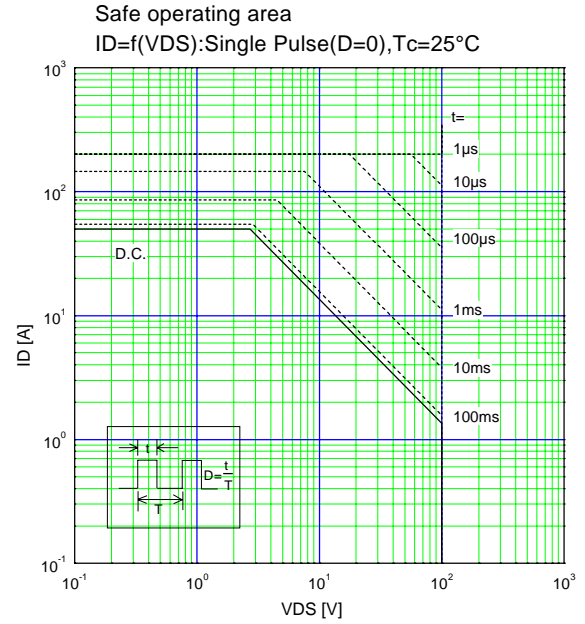
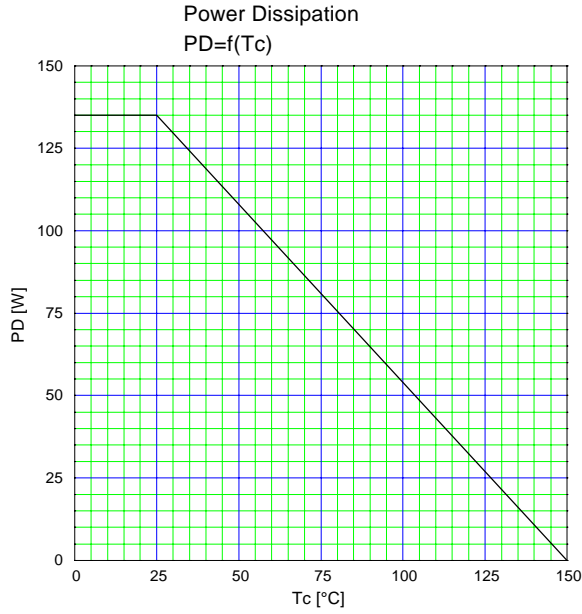
● Electrical characteristics (T_c =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	100			V
Gate threshold voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	2.5	3.0	3.5	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V V _{GS} =0V	T _{ch} =25°C	1	100	μA
			T _{ch} =125°C	0.1	0.5	mA
Gate-source leakage current	I _{GSS}	V _{GS} =±30V V _{DS} =0V		10	100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =25A V _{GS} =10V		20	25	mΩ
Forward transconductance	g _{fs}	I _D =25A V _{DS} =25V	16.0	32.0		S
Input capacitance	C _{iss}	V _{DS} =25V		3200	4800	pF
Output capacitance	C _{oss}	V _{GS} =0V		760	1140	
Reverse transfer capacitance	C _{rss}	f=1MHz		230	345	
Turn-on time t _{on}	td(on)	V _{CC} =48V I _D =50A V _{GS} =10V		23	35	ns
	t _r			130	195	
Turn-off time t _{off}	td(off)	R _{GS} =10Ω		110	165	
	t _f			65	100	
Avalanche capability	I _{AV}	L=100μH T _{ch} =25°C	50			A
Diode forward on-voltage	V _{SD}	I _F =50A V _{GS} =0V T _{ch} =25°C		0.97	1.46	V
Reverse recovery time	t _{rr}	I _F =50A V _{GS} =0V		150		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.80		μC

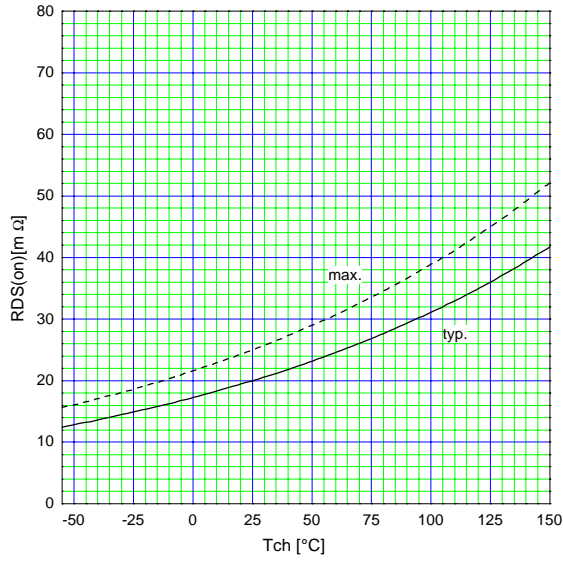
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			0.93	°C/W
	R _{th(ch-a)}	channel to ambient			75.0	°C/W

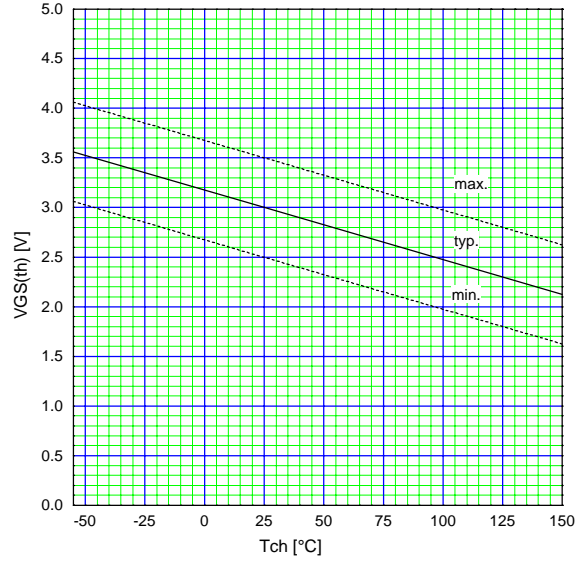
Characteristics



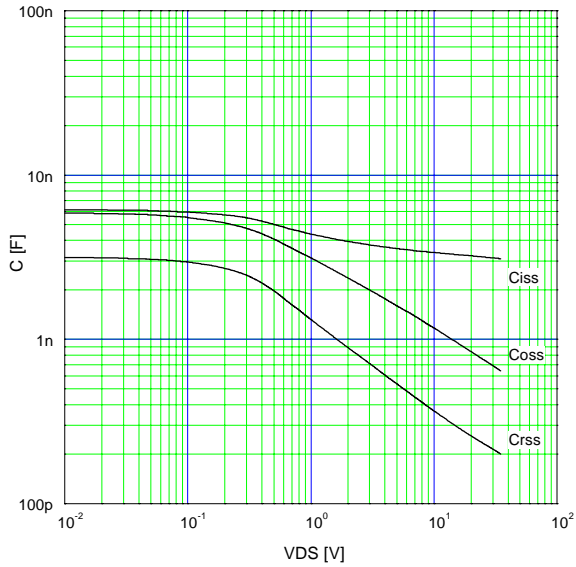
Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = 25A, V_{GS} = 10V$



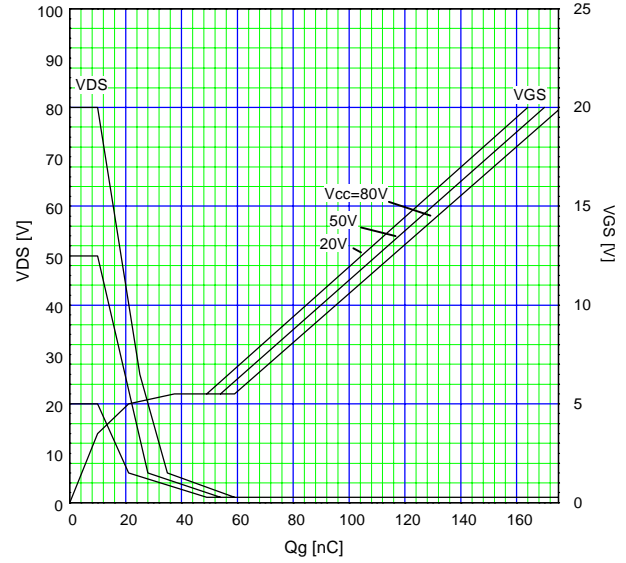
Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



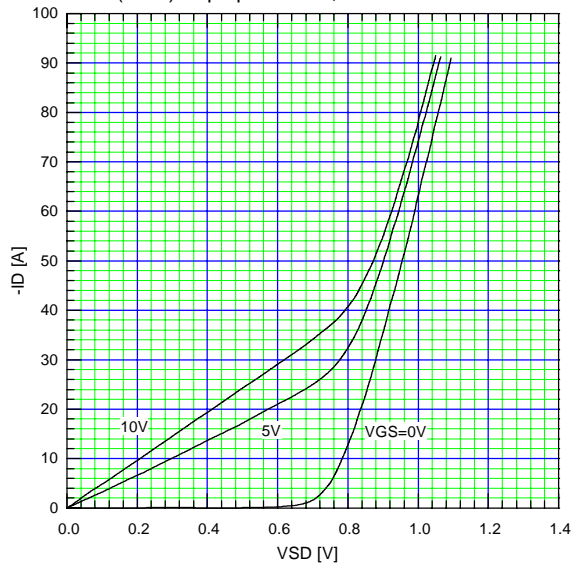
Typical capacitances
 $C = f(V_{DS}) : V_{GS} = 0V, f = 1MHz$



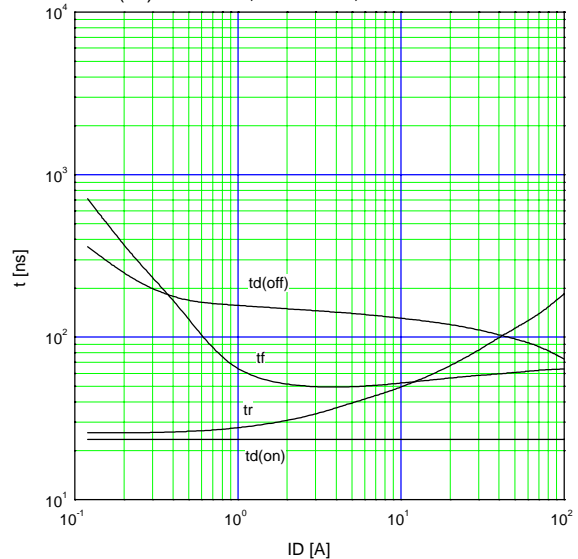
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g) : I_D = 50A, T_{ch} = 25°C$



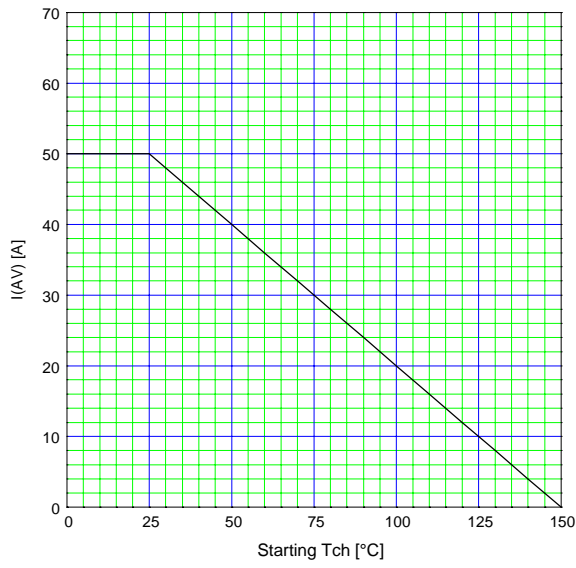
Typical Forward Characteristics of Reverse Diode
 $-I_D = f(V_{SD}) : 80\mu s \text{ pulse test}, T_{ch} = 25°C$



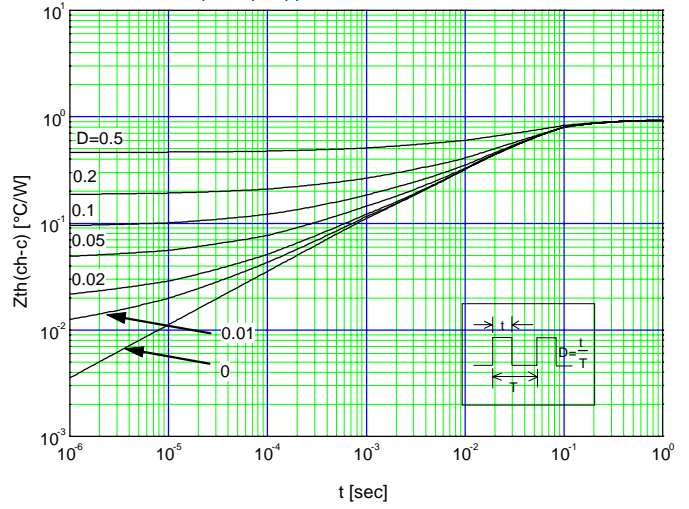
Typical Switching Characteristics vs. ID
 $t = f(I_D) : V_{cc} = 48V, V_{GS} = 10V, R_G = 10\Omega$



Maximum Avalanche Current vs. starting Tch
 $I_{(AV)} = f(\text{starting Tch}), \text{Non Repetitive}$



Transient Thermal Impedance
 $Z_{th(ch-c)} = f(t): D = t/T$



Maximum Avalanche energy vs. starting Tch
 $E_{as} = f(\text{starting Tch}): V_{cc} = 24V, I_{AV} \leq 50A, \text{Non-Repertive}$

