

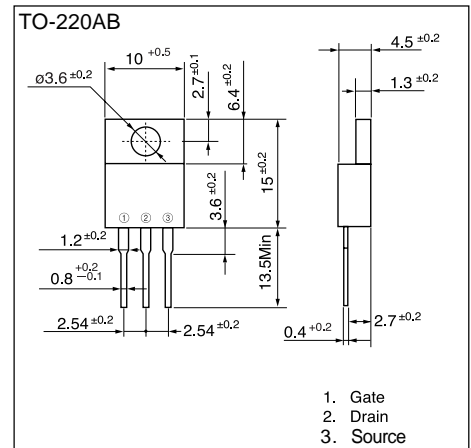
## N-CHANNEL SILICON POWER MOS-FET

### ■ 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



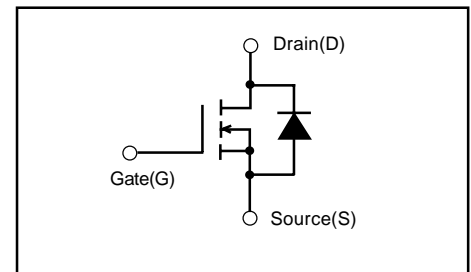
### ■ Maximum ratings and characteristic Absolute maximum ratings

● (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	60	V
Continuous drain current	I <sub>D</sub>	± 50	A
Pulsed drain current	I <sub>D</sub> (puls)	±200	A
Gate-source voltage	V <sub>GS</sub>	±30	V
Maximum Avalanche Energy	E <sub>AV</sub> *1	867	mJ
Max. power dissipation	P <sub>d</sub>	80	W
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C

\*1 L=0.463mH, V<sub>cc</sub>=24V

### ■ Equivalent circuit schematic



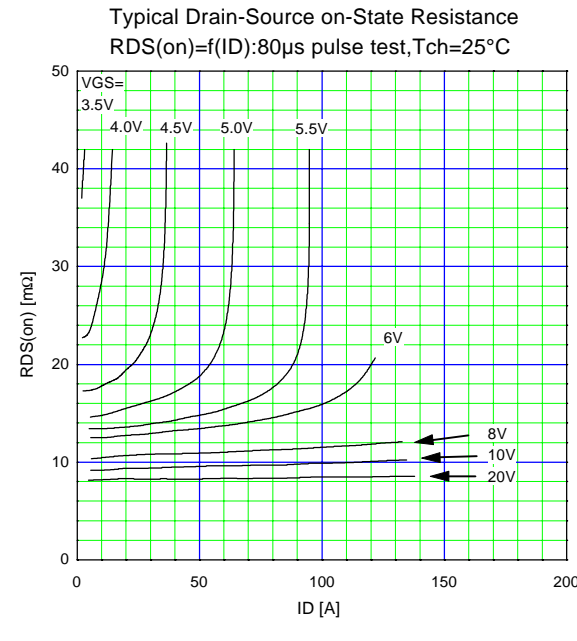
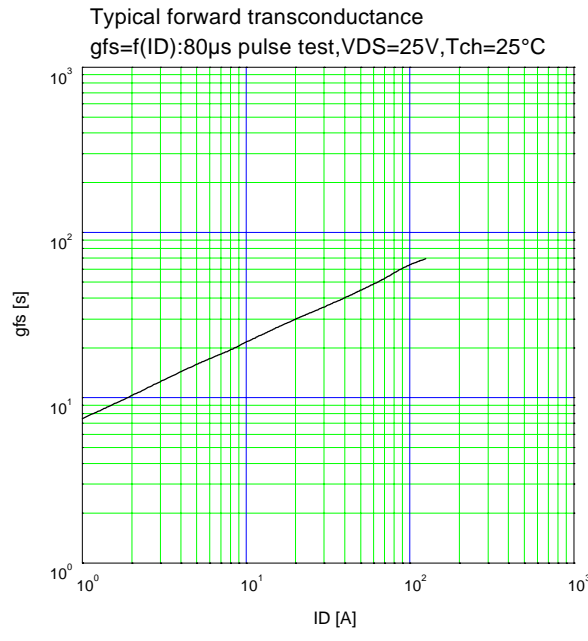
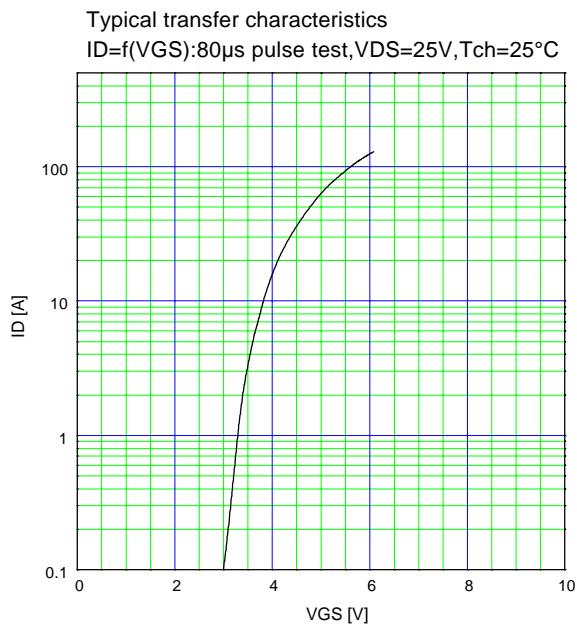
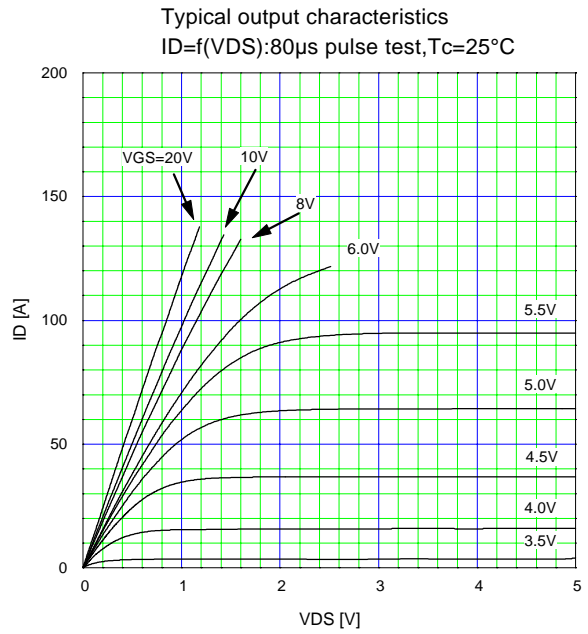
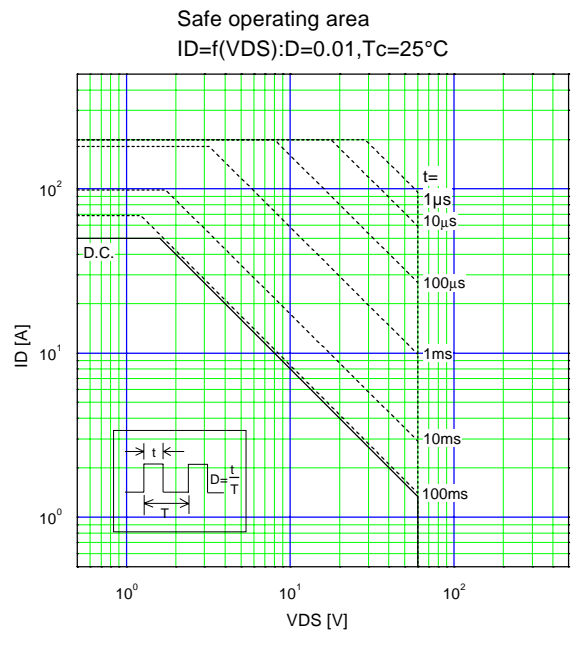
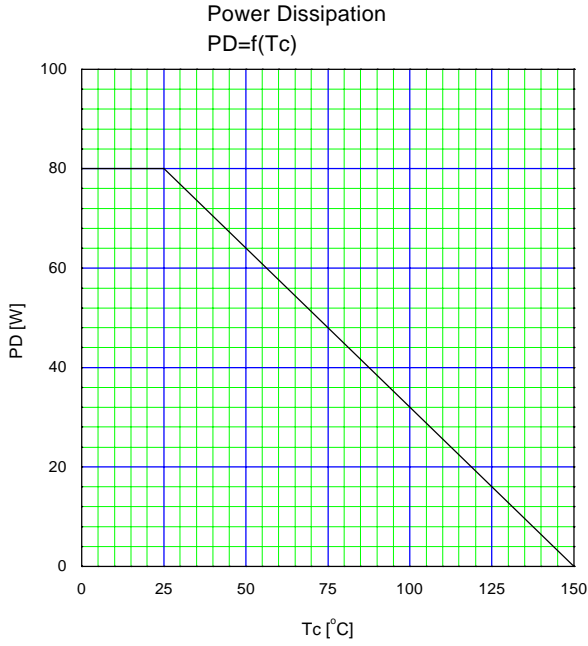
### ● Electrical characteristics (Tc =25°C unless otherwise specified)

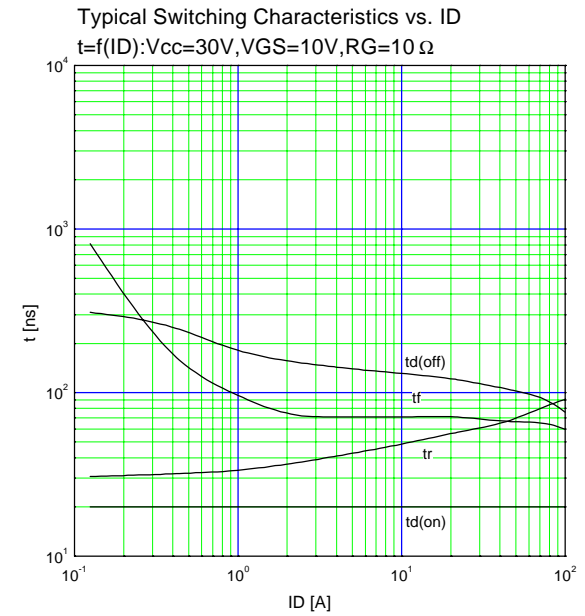
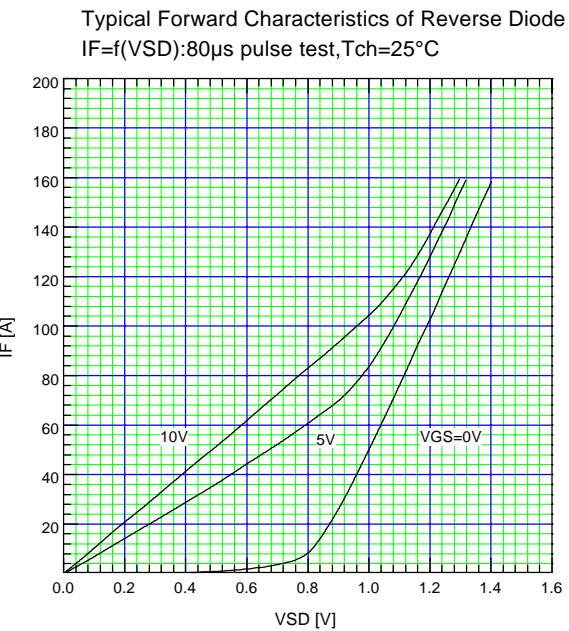
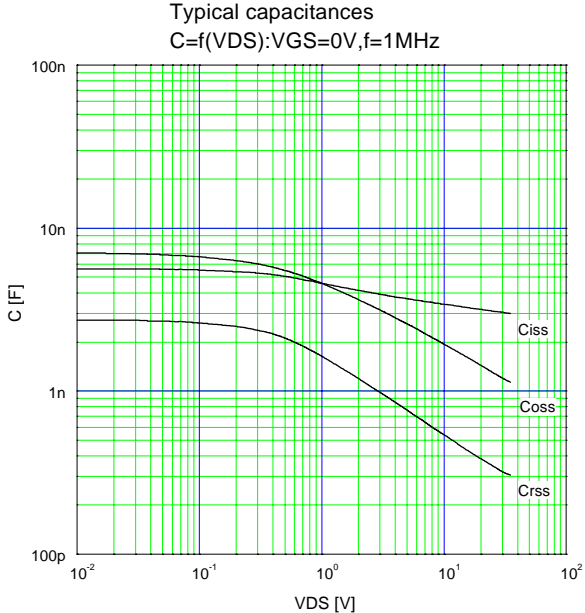
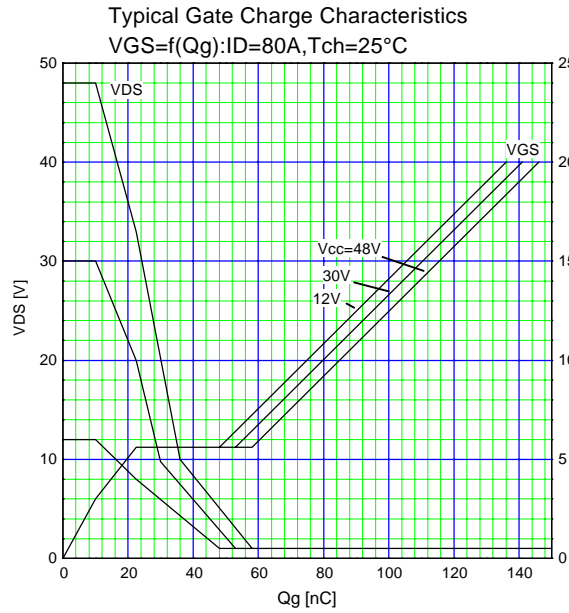
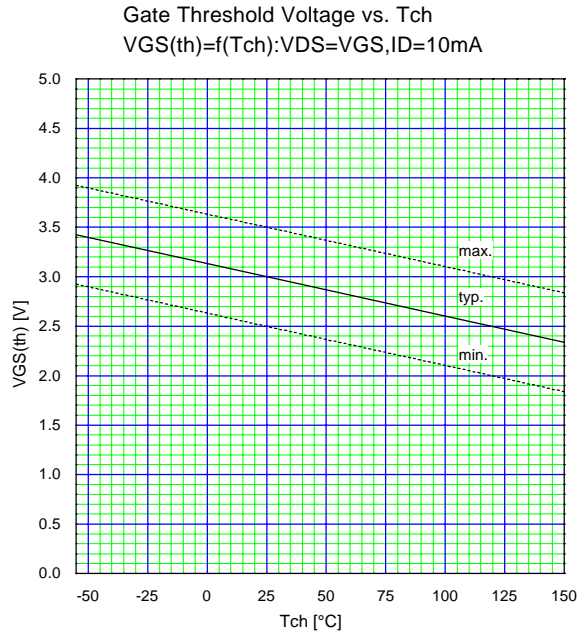
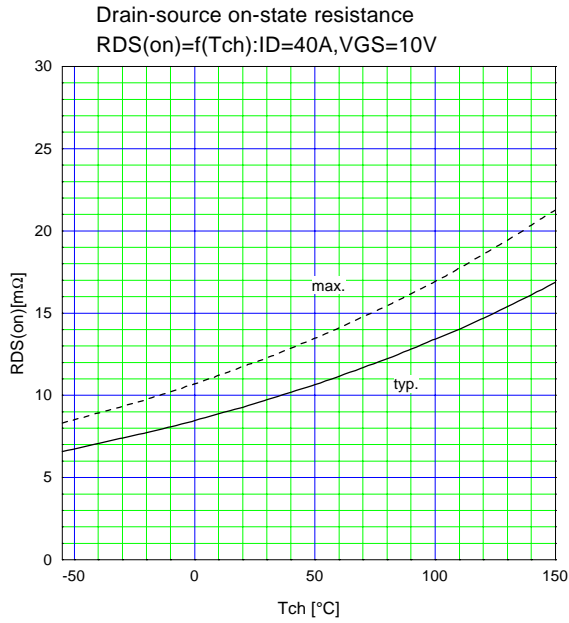
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	60			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	2.5	3.0	3.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =60V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	10	500	μA
			T <sub>ch</sub> =125°C	0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =40A V <sub>GS</sub> =10V		9.5	12	mΩ
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =40A V <sub>DS</sub> =25V	20	40		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V V <sub>GS</sub> =0V f=1MHz		3100	4650	pF
Output capacitance	C <sub>oss</sub>			1300	1950	
Reverse transfer capacitance	C <sub>rss</sub>			350	530	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =30V I <sub>D</sub> =80A V <sub>GS</sub> =10V R <sub>GS</sub> =10Ω		20	30	ns
	t <sub>r</sub>			85	120	
Turn-off time t <sub>off</sub>	td(off)			88	130	
	t <sub>f</sub>			65	120	
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	50			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =50A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.0	1.5	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =50A V <sub>GS</sub> =0V		70		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		0.13		μC

### ● Thermal characteristics

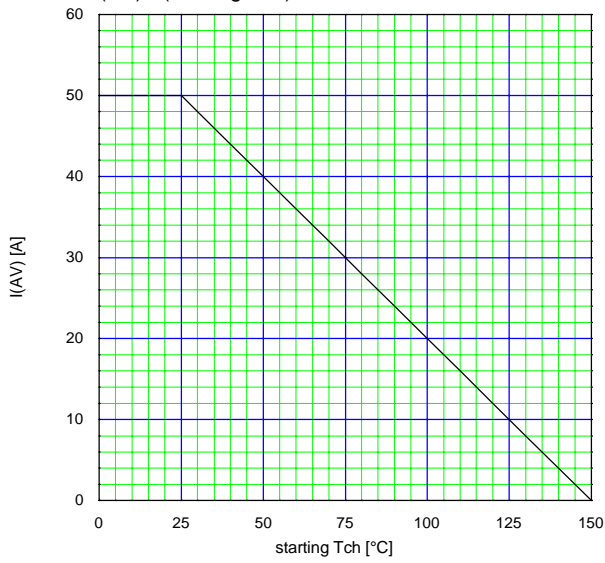
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			1.56	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			75.0	°C/W

Characteristics

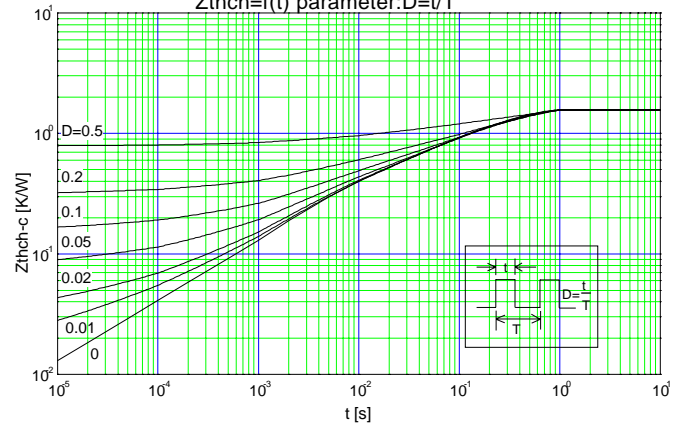




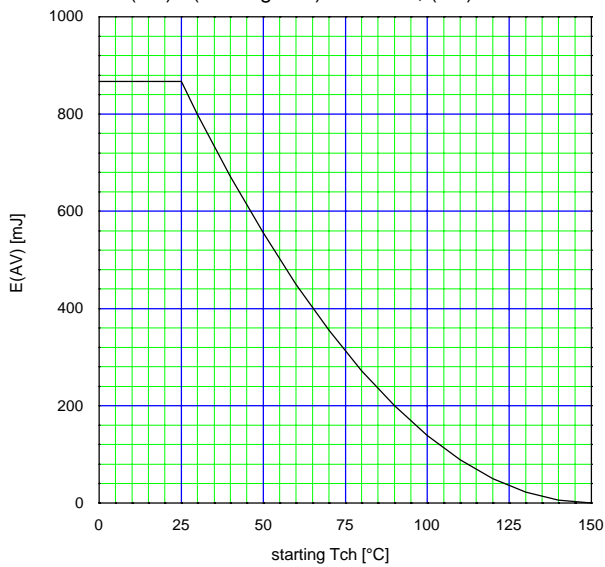
Maximum Avalanche Current vs. starting Tch  
 $I(AV)=f(\text{starting Tch})$



Transient thermal impedance  
 $Z_{thch}=f(t)$  parameter:  $D=t/T$



Maximum Avalanche Energy vs. starting Tch  
 $E(AV)=f(\text{starting Tch}): V_{cc}=24V, I(AV) \leq 50A$





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