

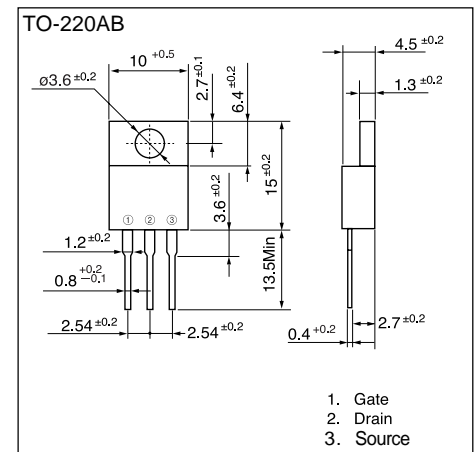
## N-CHANNEL SILICON POWER MOS-FET

### ■ 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



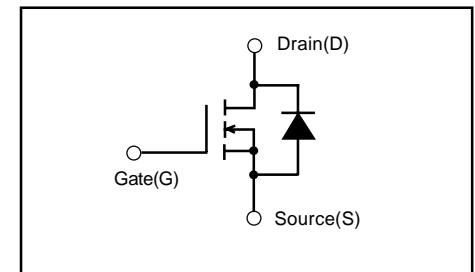
### ■ Maximum ratings and characteristic Absolute maximum ratings

● (T<sub>c</sub>=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	30	V
Continuous drain current	I <sub>D</sub>	±50	A
Pulsed drain current	I <sub>D(puls)</sub>	±200	A
Gate-source voltage	V <sub>GS</sub>	±16	V
Maximum Avalanche Energy	E <sub>AV</sub> *1	1735	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=0.925mH, V<sub>cc</sub>=12V

### ■ Equivalent circuit schematic



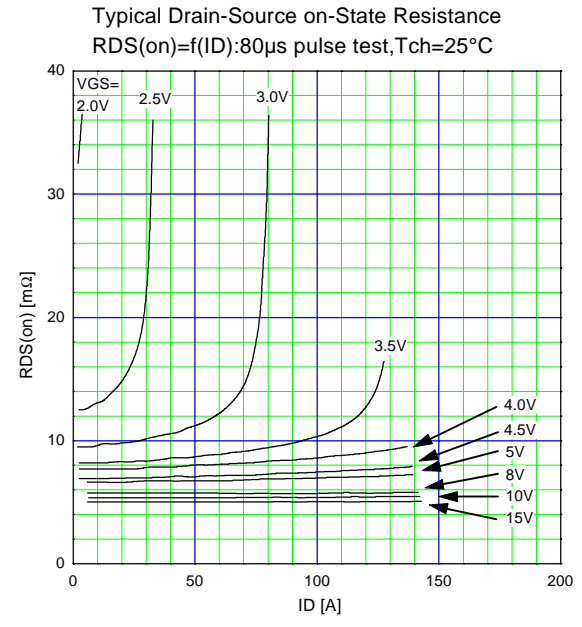
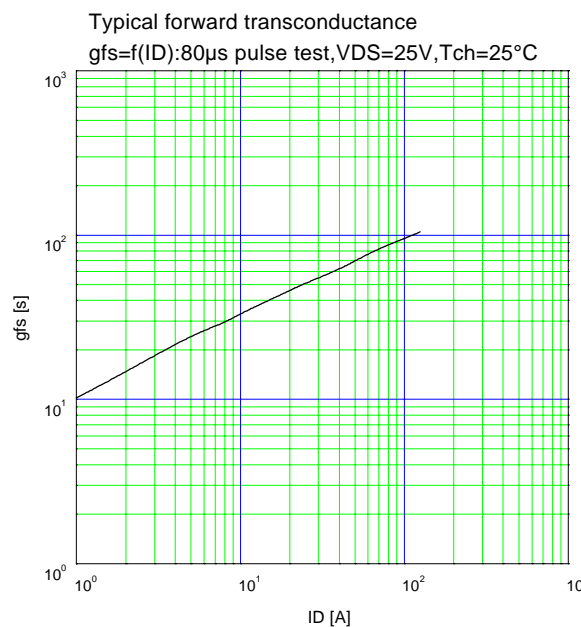
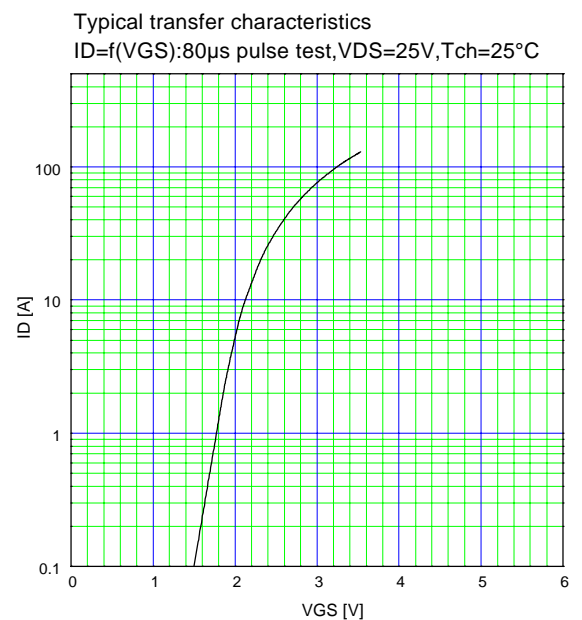
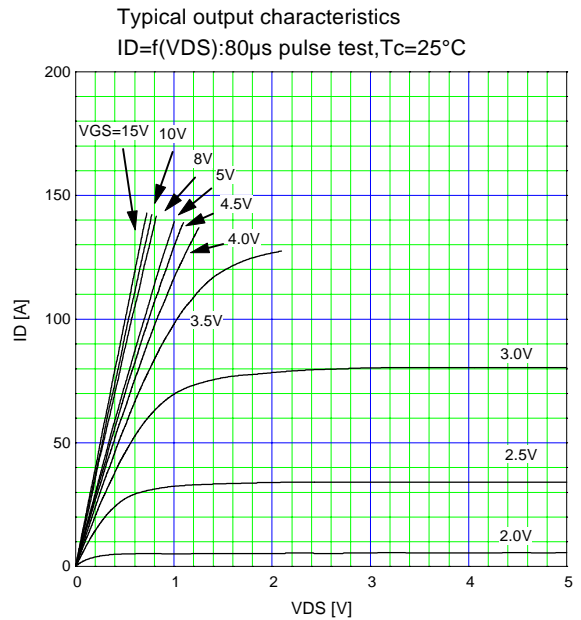
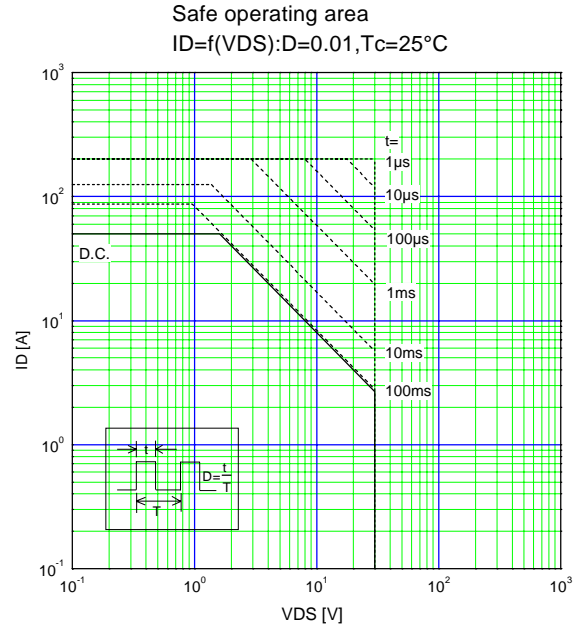
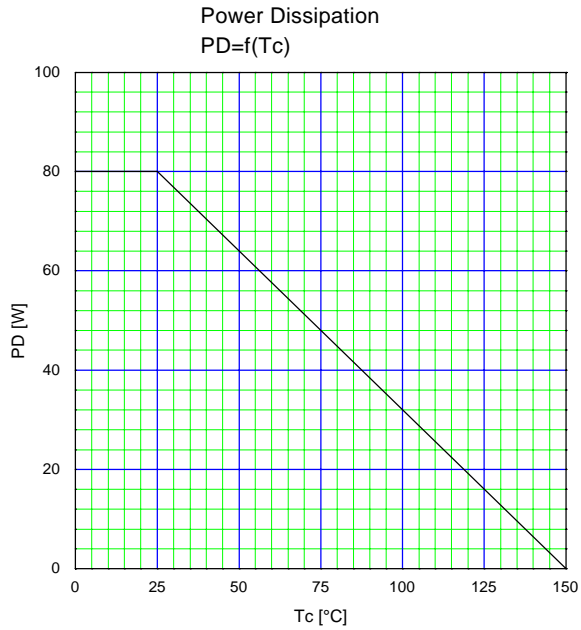
### ● Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

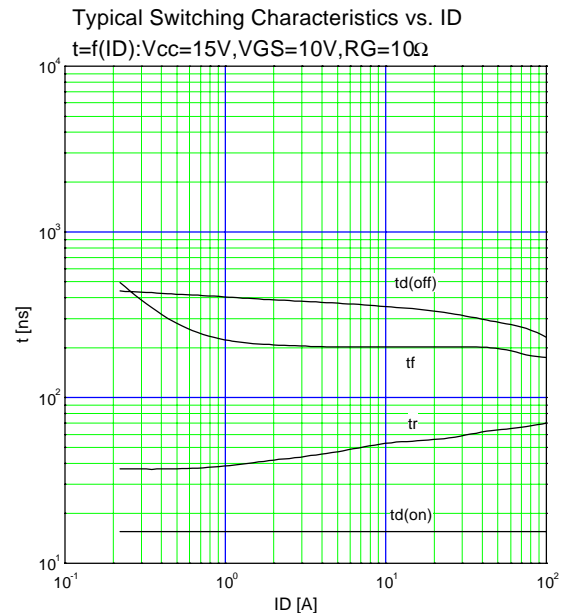
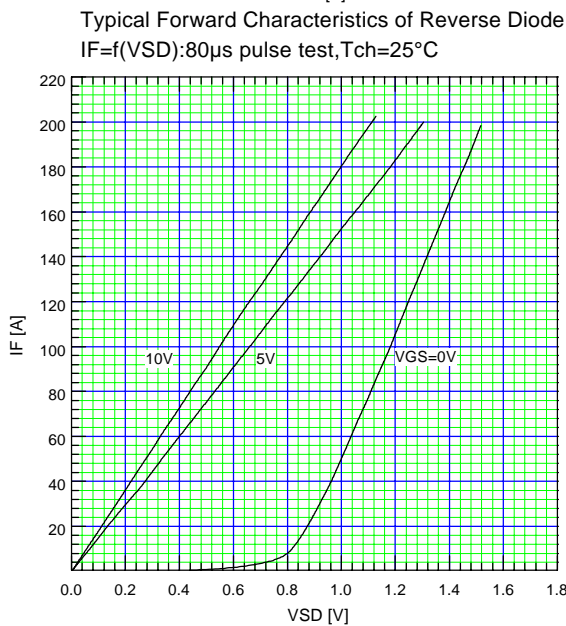
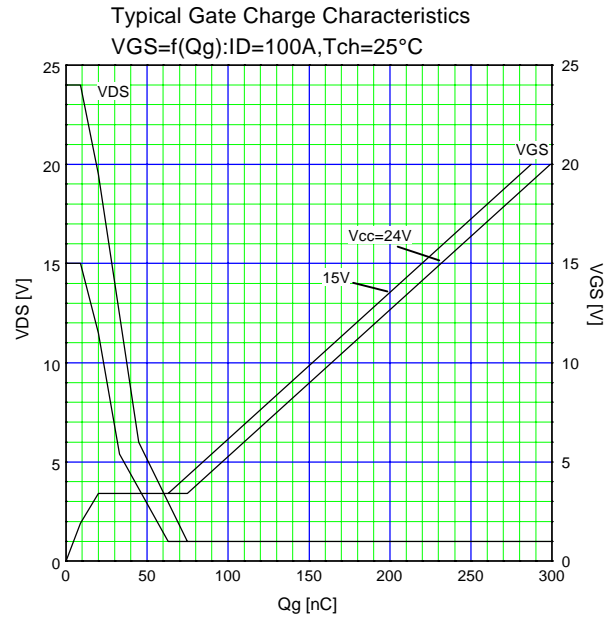
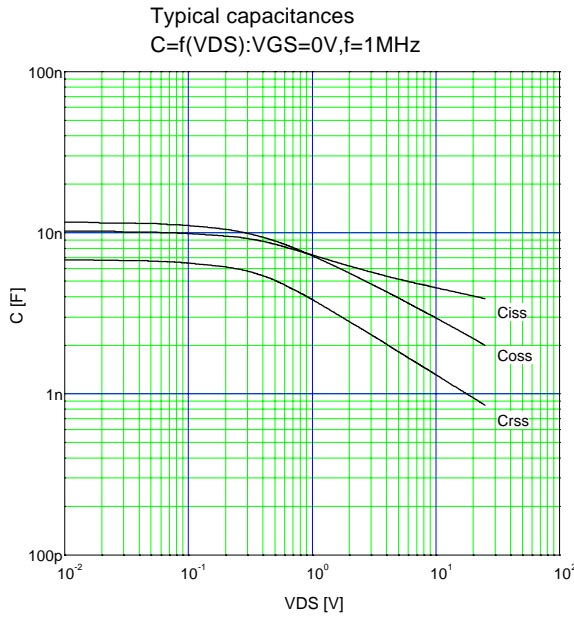
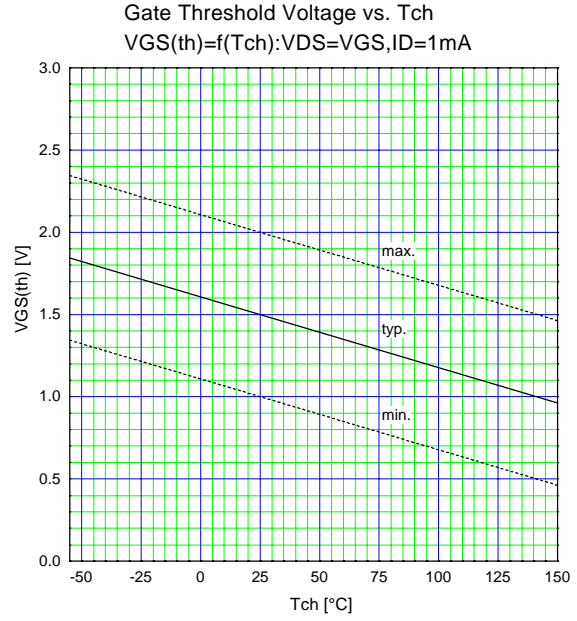
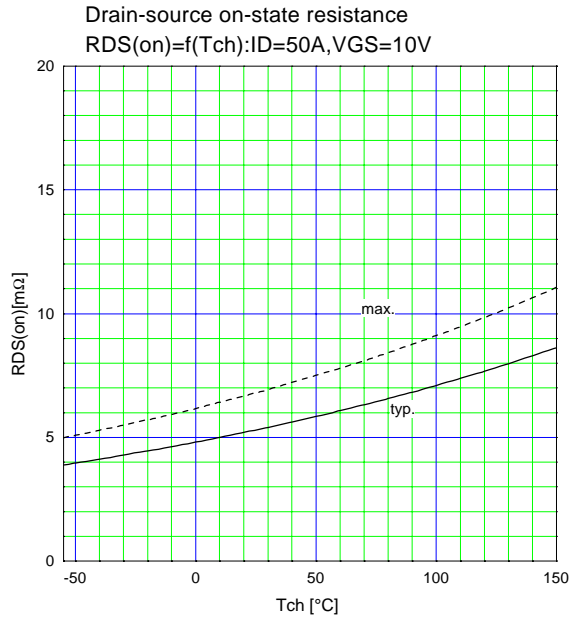
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	30			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	1.0	1.5	2.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =30V 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> =±16V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =50A V <sub>GS</sub> =4V		8.0	10.5	mΩ
		I <sub>D</sub> =50A V <sub>GS</sub> =10V		5.3	6.8	
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =50A V <sub>DS</sub> =25V	35	70		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		3900	5850	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		2000	3000	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		850	1280	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =15V I <sub>D</sub> =100A		17	30	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V		70	110	
Turn-off time t <sub>off</sub>	td(off)	R <sub>G</sub> =10Ω		250	380	
	t <sub>f</sub>			180	270	
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		65		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		0.12		μC

### ● Thermal characteristics

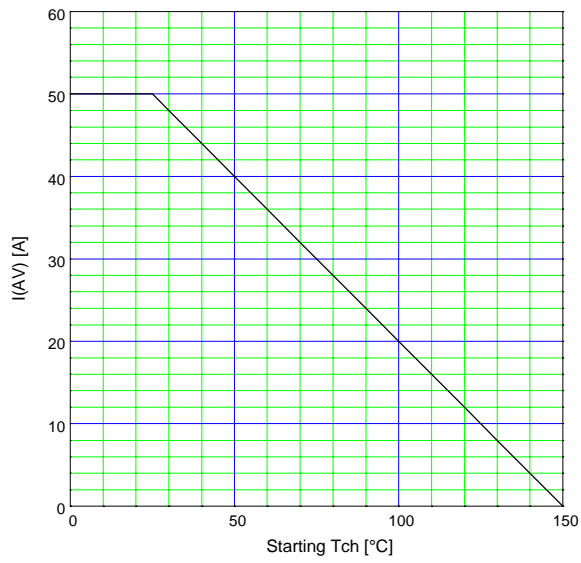
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			1.56	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			75.0	°C/W

Characteristics

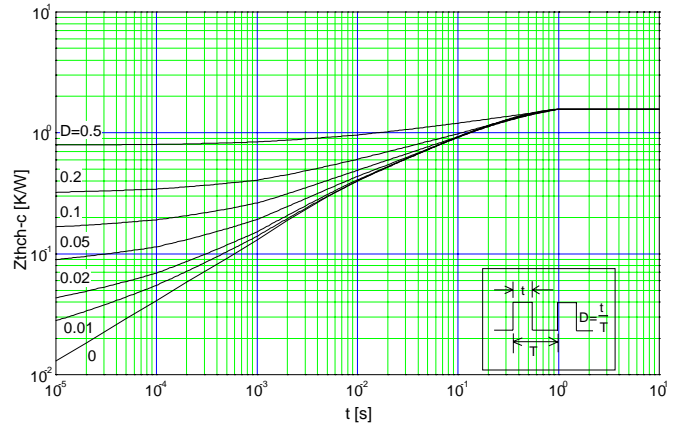




Maximum Avalanche Current vs. starting Tch  
 $I(AV)=f(\text{starting Tch})$



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



Maximum Avalanche energy vs. starting Tch  
 $E_{as}=f(\text{starting Tch}): V_{cc}=12V, I(AV) \leq 50A$

