

### 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	Ratings	Unit
Drain-source voltage	V <sub>DS</sub>	500	V
Continuous drain current	I <sub>D</sub>	±8	A
Pulsed drain current	I <sub>D(puls)</sub>	±32	A
Gate-source voltage	V <sub>GS</sub>	±30	V
Repetitive or non-repetitive	IAR *2	8	A
Maximum Avalanche Energy	EAS *1	173	mJ
Maximum Drain-Source dV/dt	dV <sub>DS</sub> /dt *4	20	kV/μs
Peak Diode Recovery dV/dt	dV/dt *3	5	kV/μs
Max. power dissipation	P <sub>D</sub>	T <sub>a</sub> =25°C	2.02
		T <sub>c</sub> =25°C	65
Operating and storage temperature range	T <sub>ch</sub>	+150	°C
	T <sub>stg</sub>	-55 to +150	°C

\*1 L=4.98mH, V<sub>CC</sub>=50V \*2 T<sub>ch</sub>≤150°C \*3 I<sub>F</sub>≤-I<sub>D</sub>, -di/dt=50A/μs, V<sub>CC</sub>≤BV<sub>DS</sub>, T<sub>ch</sub>≤150°C  
 \*4 V<sub>DS</sub>≤500V

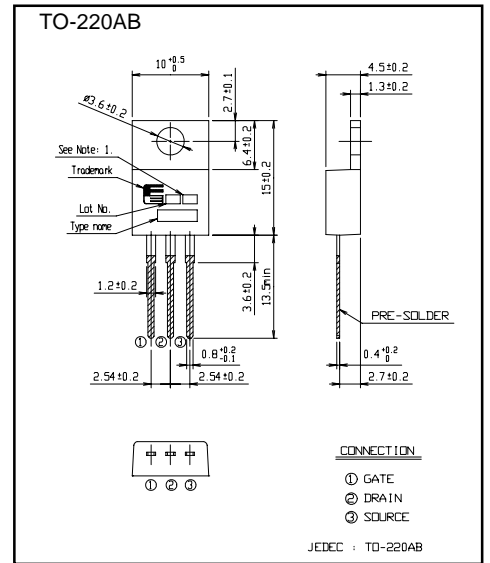
### Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =250μA V <sub>GS</sub> =0V	500			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =250μA V <sub>DS</sub> =V <sub>GS</sub>	3.0		5.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =500V V <sub>GS</sub> =0V			25	μA
		V <sub>DS</sub> =400V V <sub>GS</sub> =0V			250	
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> =4A V <sub>GS</sub> =10V		0.65	0.85	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =4A V <sub>DS</sub> =25V	3.5	7		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		750	1130	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		100	150	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		4.0	6.0	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =300V I <sub>D</sub> =4A		14	21	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V		9	14	
Turn-off time t <sub>off</sub>	td(off)	R <sub>GS</sub> =10 Ω		24	36	
	t <sub>f</sub>			6	9	
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =250V		20	30	nC
Gate-Source Charge	Q <sub>GS</sub>	I <sub>D</sub> =8A		8.5	13	
Gate-Drain Charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		5.5	8.5	
Avalanche capability	I <sub>AV</sub>	L=4.98mH T <sub>ch</sub> =25°C	8			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =8A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.00	1.50	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =8A V <sub>GS</sub> =0V		0.65		μs
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		3.5		μC

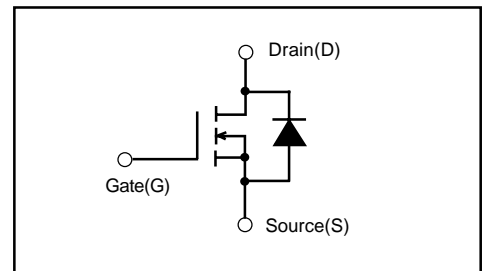
### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			1.92	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			62.0	°C/W

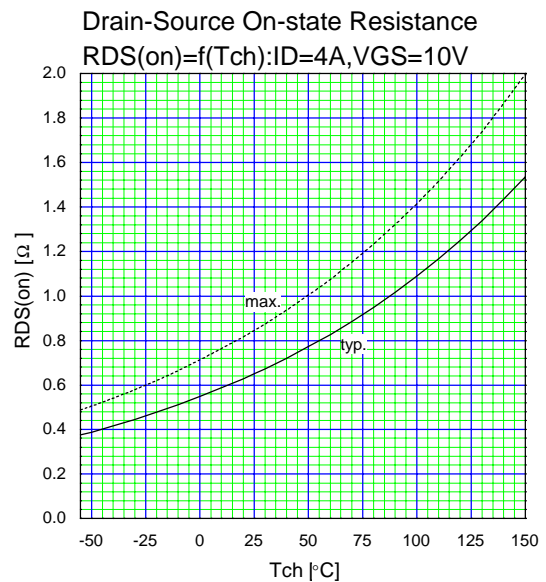
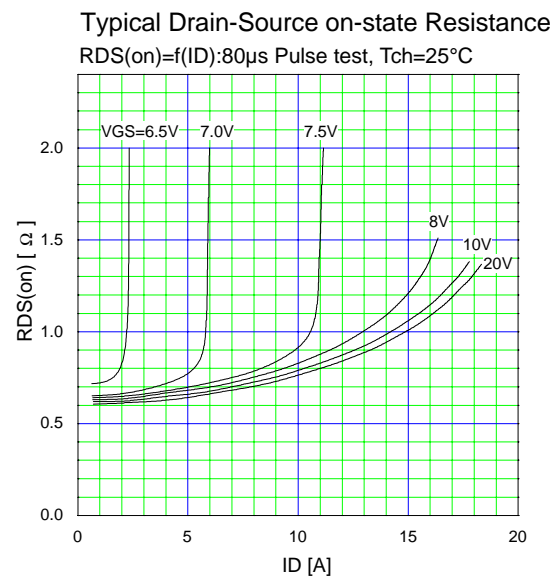
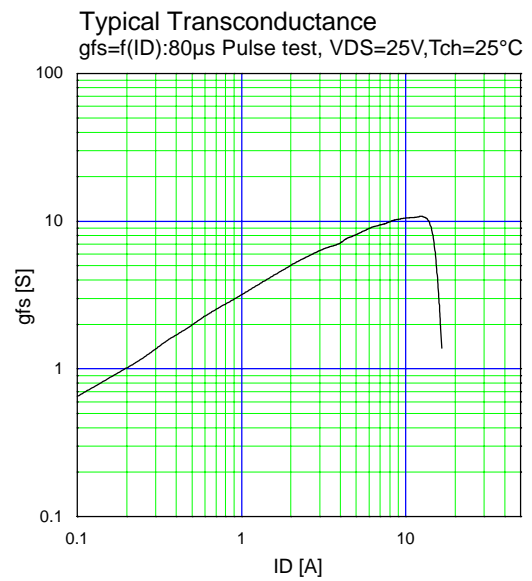
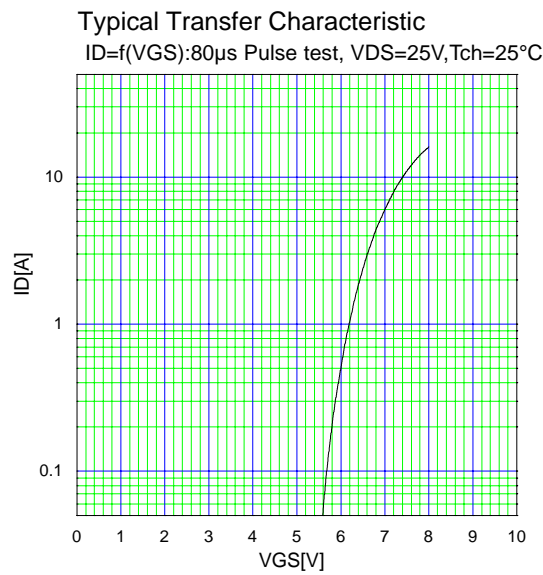
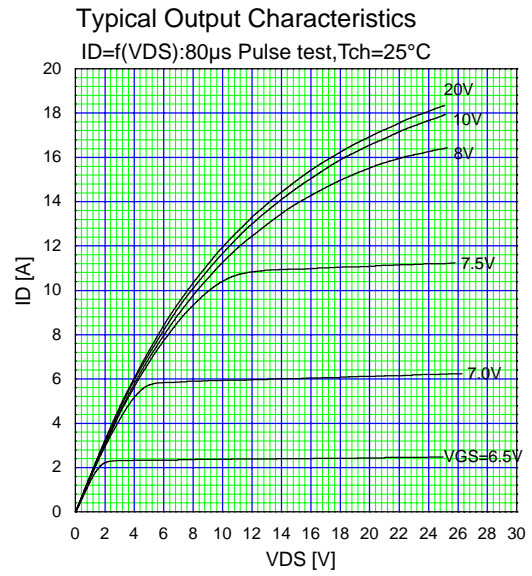
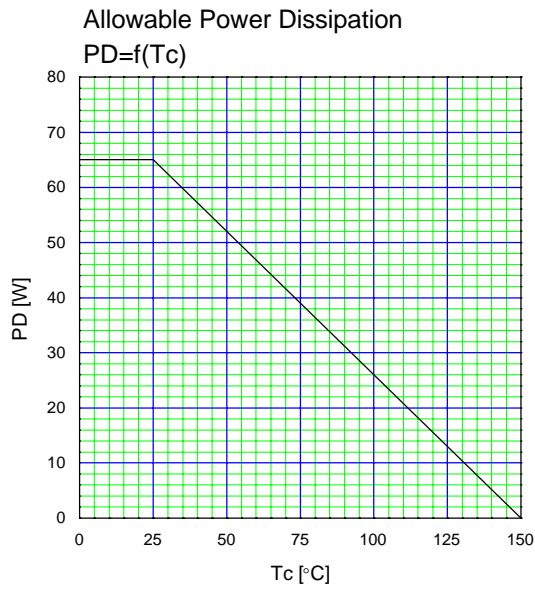
### Outline Drawings



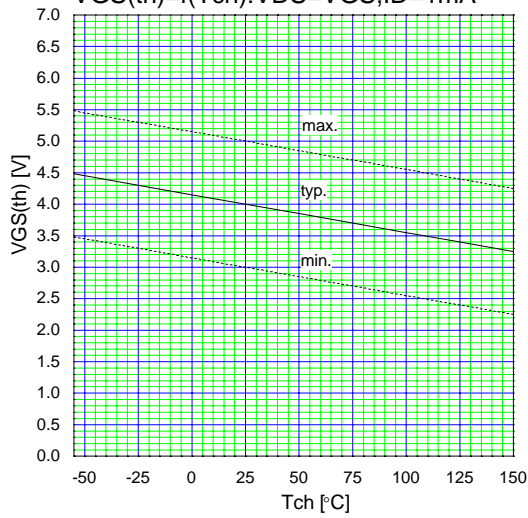
### Equivalent circuit schematic



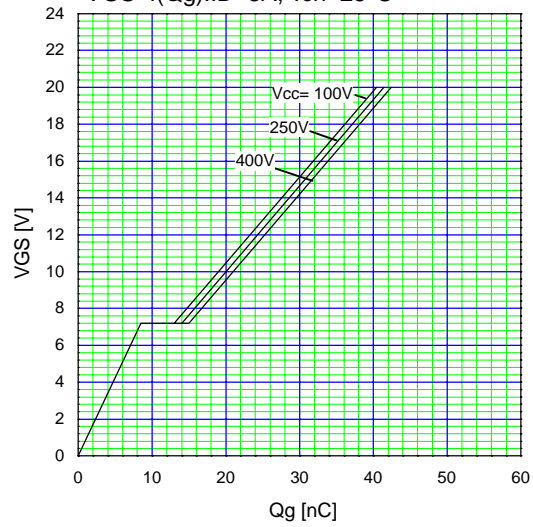
Characteristics



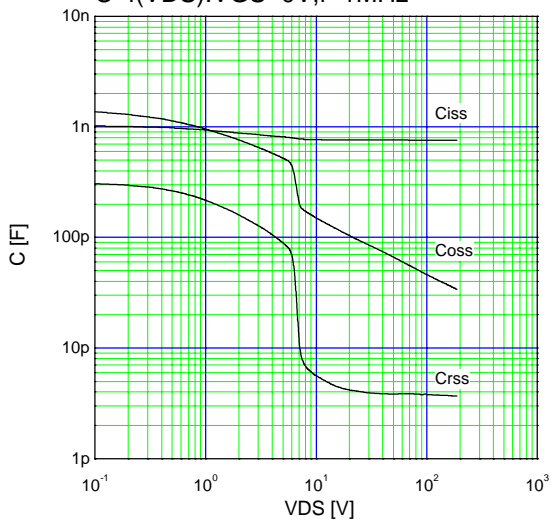
Gate Threshold Voltage vs. T<sub>ch</sub>  
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS}, I_D=1\text{mA}$



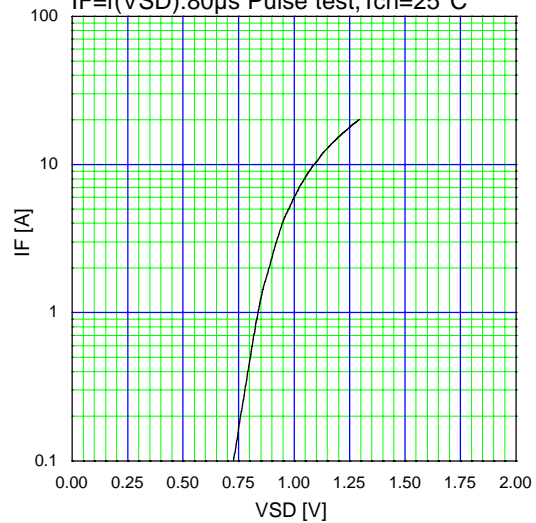
Typical Gate Charge Characteristics  
 $V_{GS}=f(Q_g):I_D=8\text{A}, T_{ch}=25^\circ\text{C}$



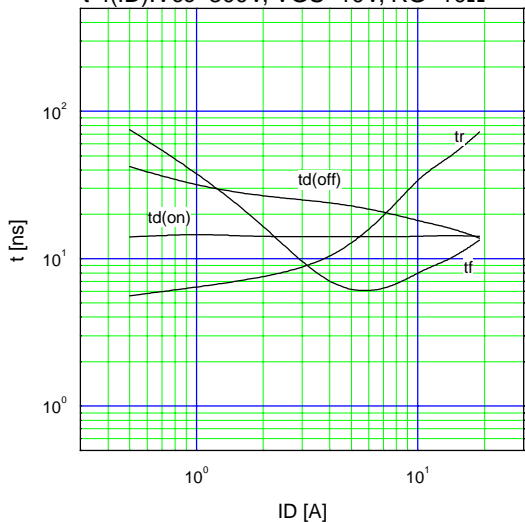
Typical Capacitance  
 $C=f(V_{DS}):V_{GS}=0\text{V}, f=1\text{MHz}$



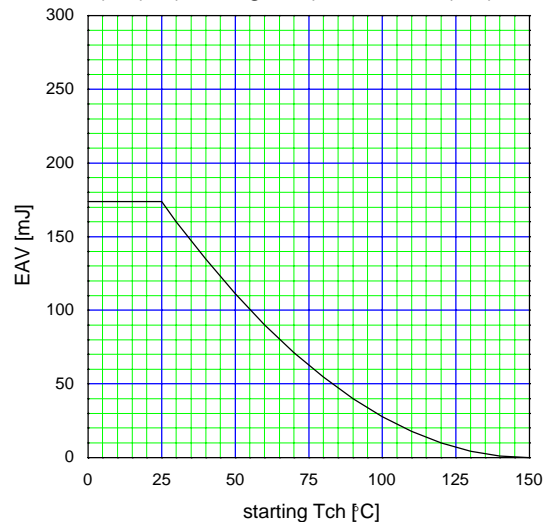
Typical Forward Characteristics of Reverse Diode  
 $I_F=f(V_{SD}):80\mu\text{s Pulse test}, T_{ch}=25^\circ\text{C}$

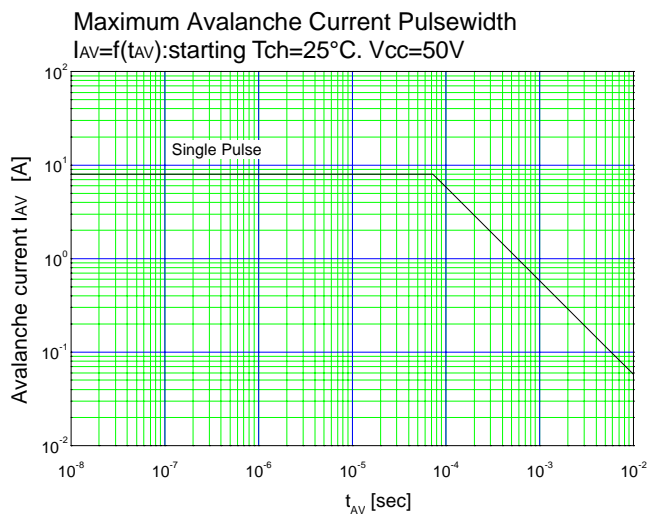
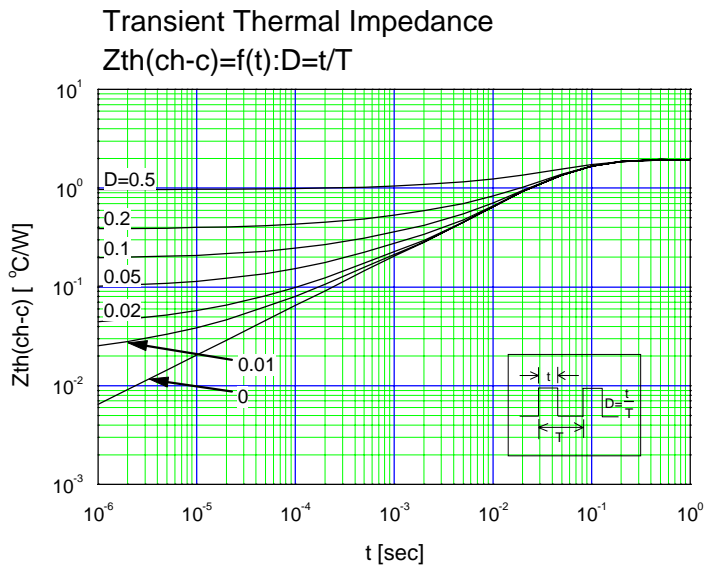


Typical Switching Characteristics vs. I<sub>D</sub>  
 $t=f(I_D):V_{cc}=300\text{V}, V_{GS}=10\text{V}, R_G=10\Omega$



Maximum Avalanche Energy vs. starting T<sub>ch</sub>  
 $E(AV)=f(\text{starting } T_{ch}):V_{cc}=50\text{V}, I(AV)\leq 8\text{A}$





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