

N-CHANNEL SILICON POWER MOS-FET

■ Features

High speed switching
 Low on-resistance
 No secondary breakdown
 Low driving power
 High voltage
 $V_{GS}=\pm 35V$ Guarantee
 Avalanche-proof

■ Applications

Switching regulators
 UPS
 DC-DC converters
 General purpose power amplifier

■ Maximum ratings and characteristic Absolute maximum ratings

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

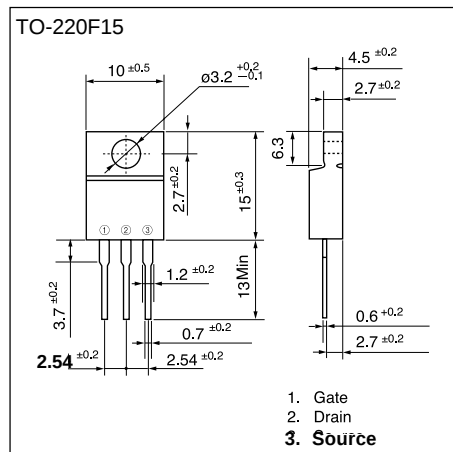
Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	500	V
Continuous drain current	I_D	± 15	A
Pulsed drain current	$I_{D(puls)}$	± 60	A
Gate-source voltage	V_{GS}	± 35	V
Maximum Avalanche Energy	E_{AV*1}	88.7	mJ
Max. power dissipation	P_D	50	W
Operating and storage temperature range	T_{ch} T_{stg}	$+150$ -55 to $+150$	$^\circ\text{C}$ $^\circ\text{C}$

*1 $L=0.72\text{mH}$, $V_{CC}=50V$ ● Electrical characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

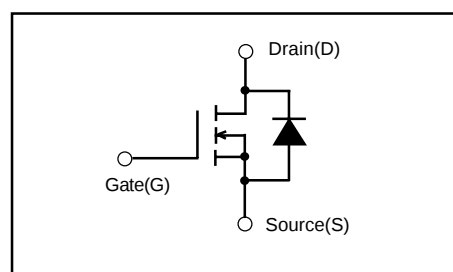
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ $V_{GS}=0V$	500			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	3.5	4.0	4.5	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=500V$ $V_{GS}=0V$ $T_{ch}=25^\circ\text{C}$		10	500	μA
		$T_{ch}=125^\circ\text{C}$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 35V$ $V_{DS}=0V$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=7.5A$ $V_{GS}=10V$		0.44	0.55	Ω
Forward transconductance	g_{fs}	$I_D=7.5A$ $V_{DS}=25V$	4.5	9.0		S
Input capacitance	C_{iss}	$V_{DS}=25V$		1400	2100	pF
Output capacitance	C_{oss}	$V_{GS}=0V$		250	380	
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$		110	170	ns
Turn-on time t_{on}	$t_{d(on)}$	$V_{CC}=300V$ $I_D=15A$		30	50	
	t_r	$V_{GS}=10V$		110	170	
Turn-off time t_{off}	$t_{d(off)}$	$R_{GS}=10\Omega$		90	140	
	t_f			55	90	
Avalanche capability	I_{AV}	$L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	15			A
Diode forward on-voltage	V_{SD}	$I_F=2I_D$ $V_{GS}=0V$ $T_{ch}=25^\circ\text{C}$		1.1	1.65	V
Reverse recovery time	t_{rr}	$I_F=I_D$ $V_{GS}=0V$		500		ns
Reverse recovery charge	Q_{rr}	$-di/dt=100A/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		8.0		μC

● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			2.50	$^\circ\text{C/W}$
	$R_{th(ch-a)}$	channel to ambient			62.5	$^\circ\text{C/W}$



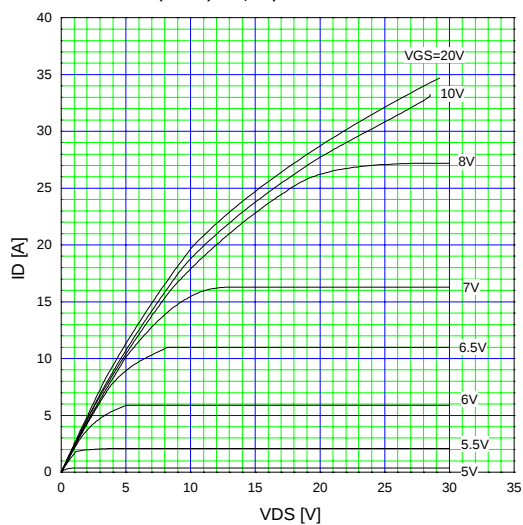
■ Equivalent circuit schematic



Characteristics

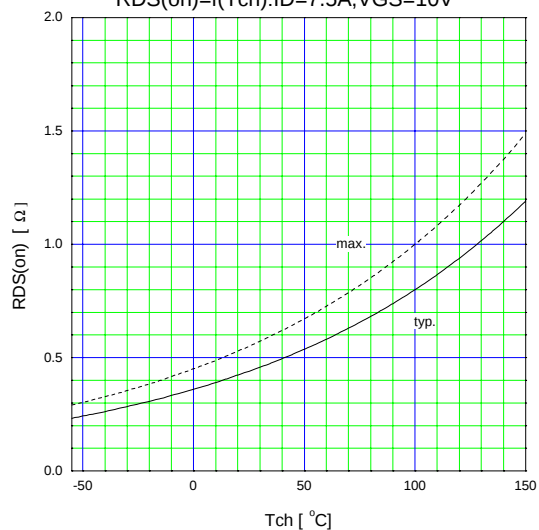
Typical output characteristics

ID=f(VDS):80μs pulse test, Tc=25°C



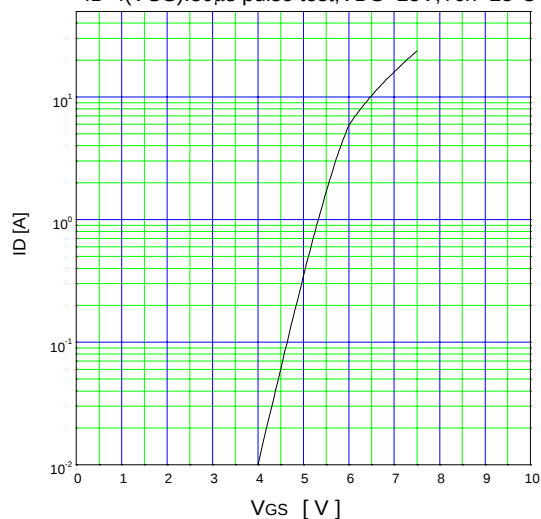
Drain-source on-state resistance

RDS(on)=f(Tch):ID=7.5A, VGS=10V



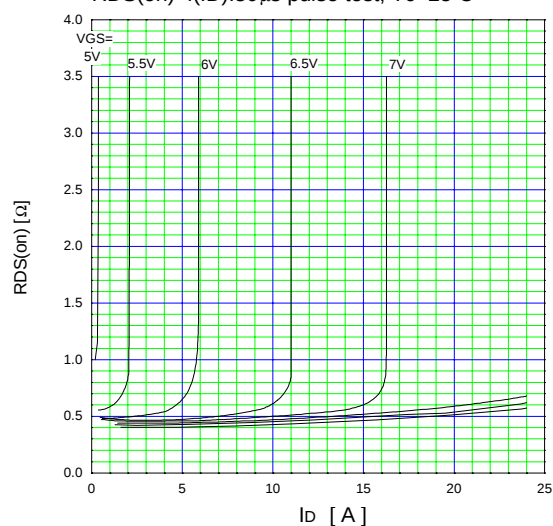
Typical transfer characteristic

ID=f(VGS):80μs pulse test, VDS=25V, Tch=25°C



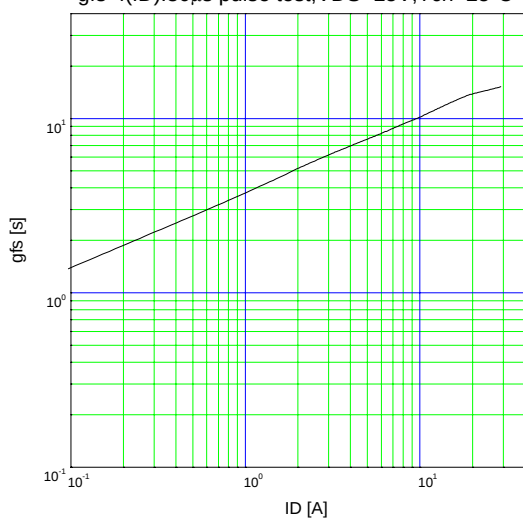
Typical drain-source on-state resistance

RDS(on)=f(ID):80μs pulse test, Tc=25°C



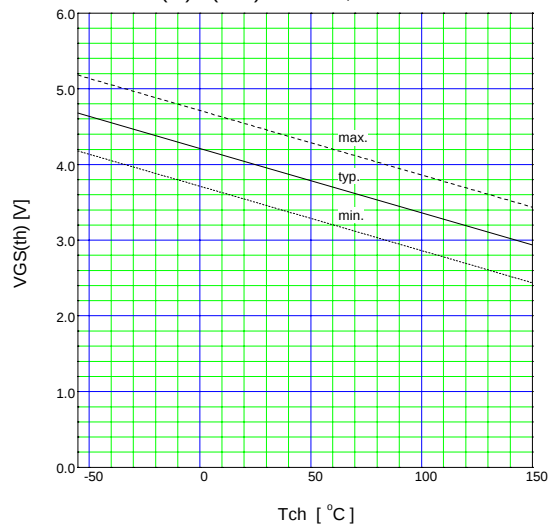
Typical forward transconductance

gfs=f(ID):80μs pulse test, VDS=25V, Tch=25°C

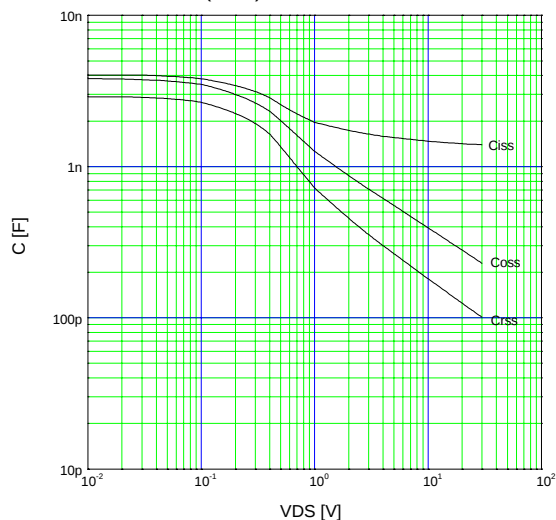


Gate threshold voltage

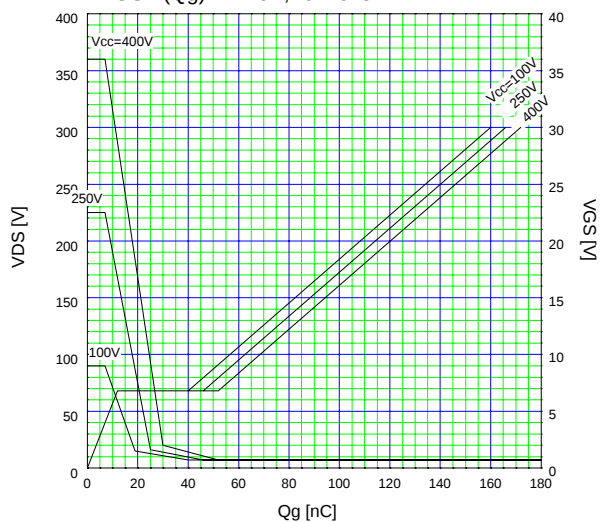
VGS(th)=f(Tch):ID=1mA, VDS=VGS



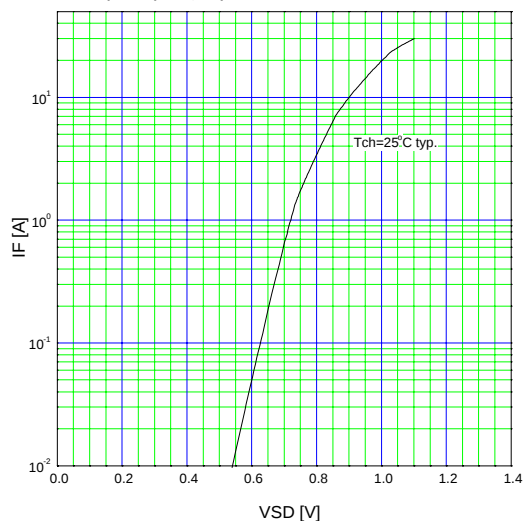
Typical capacitances
 $C=f(V_{DS}):V_{GS}=0V, f=1MHz$



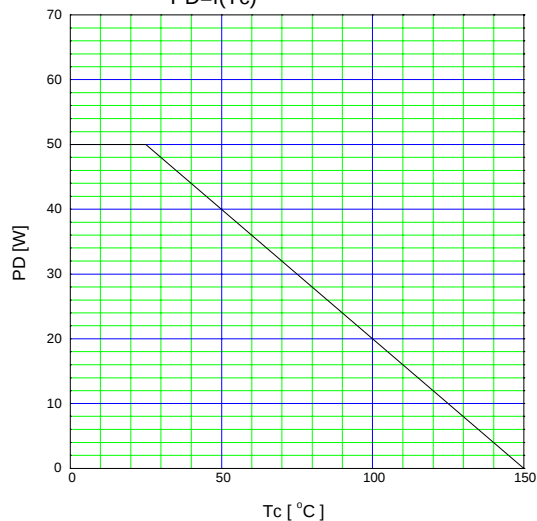
Typical gate charge characteristic
 $V_{GS}=f(Q_g):I_D=15A, T_c=25^\circ C$



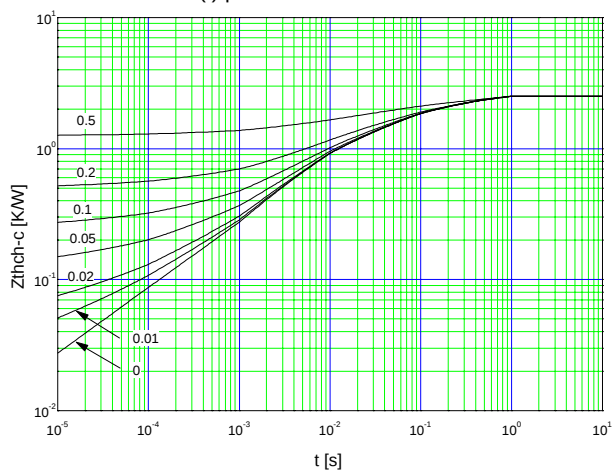
Forward characteristic of reverse of diode
 $I_F=f(V_{SD}):80\mu s$ pules test, $V_{GS}=0V$



Power Dissipation
 $PD=f(T_c)$



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



Safe operating area
 $I_D=f(V_{DS}):D=0.01, T_c=25^\circ C$

