

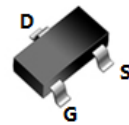
Features:

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications:

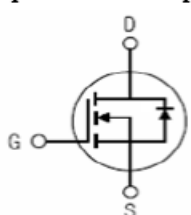
PWM applications
 Load switch
 Power management

V_{DSS}	30	V
I_D	3.0	A
P_D	0.9	W
$R_{DS(ON)}$	65	mΩ



SOT23-3

Inner Equivalent Principium Chart



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	30	V
I_D	Continuous Drain Current	3.0	A
	Continuous Drain Current $T_c = 70^\circ\text{C}$	2.5	A
I_{DM}^{a1}	Pulsed Drain Current	20	A
V_{GS}	Gate-to-Source Voltage	± 20	V
$\frac{dv}{dt}^{a3}$	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	0.9	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	300	$^\circ\text{C}$

Electrical Characteristics (T_c = 25 °C unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	30	--	--	V
Δ BV _{DSS} / Δ T _J	Bvdss Temperature Coefficient	I _D =-250uA, Reference 25°C	--	0.1	--	V/°C
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 30, V _{GS} = 0V, T _a = 25°C	--	--	1	μA
		V _{DS} = 24V, V _{GS} = 0V, T _a = 125°C	--	--	250	
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} = +20V	--	--	1	μA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} = -20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =10V, I _D =3.0A	--	50	65	mΩ
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =4.5V, I _D =3.0A	--	65	75	mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.5	2.0	V
Pulse width tp ≤ 380μs, δ ≤ 2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D = 3.0A	--	18	--	S
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz	--	240	--	pF
C _{oss}	Output Capacitance		--	35	--	
C _{rss}	Reverse Transfer Capacitance		--	18	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D = 1.0A V _{DD} = 15V V _{GS} = 10V R _G = 6.0Ω	--	3.5	--	ns
t _r	Rise Time		--	1.5	--	
t _{d(OFF)}	Turn-Off Delay Time		--	18	--	
t _f	Fall Time		--	2.5	--	
Q _g	Total Gate Charge	I _D = 3.0A V _{DD} = 15V V _{GS} = 10V	--	10	--	nC
Q _{gs}	Gate to Source Charge		--	1.0	--	
Q _{gd}	Gate to Drain ("Miller") Charge		--	1.6	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	3.0	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	20	A
V_{SD}	Diode Forward Voltage	$I_S=3.0A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=3.0A, T_j = 25^\circ C$ $di_F/dt=100A/us, V_{GS}=0V$	--	40	--	ns
Q_{rr}	Reverse Recovery Charge		--	100	--	nC
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	138	$^\circ C/W$

^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a3}: $I_{SD} = 3.0A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, Start T_j = 25^\circ C$

Typical Electrical and Thermal Characteristics

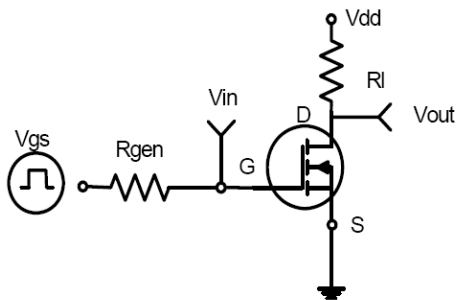


Figure 1: Switching Test Circuit

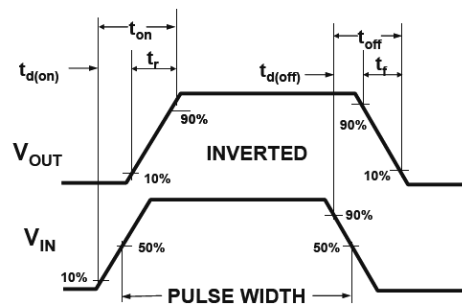


Figure 2: Switching Waveforms

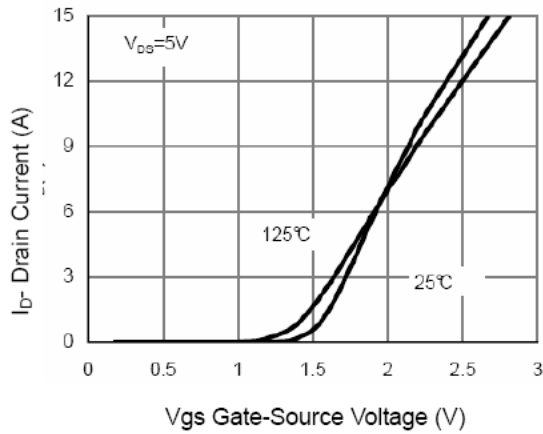


Figure 7 Transfer Characteristics

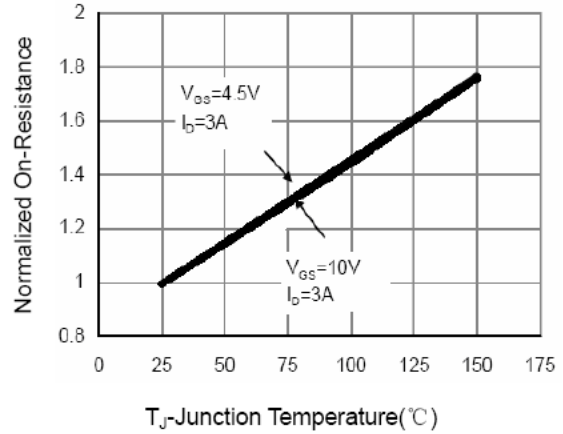


Figure 8 Drain-Source On-Resistance

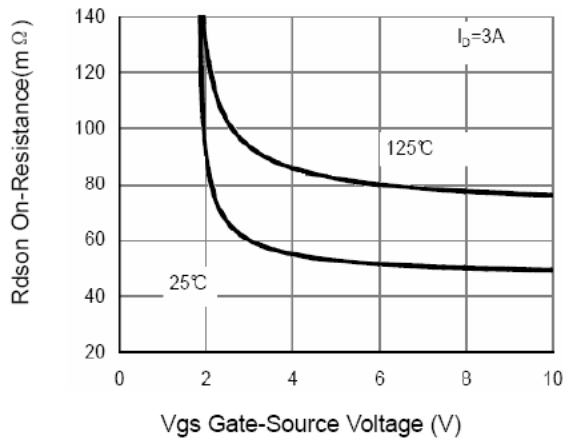


Figure 9 Rdson vs Vgs

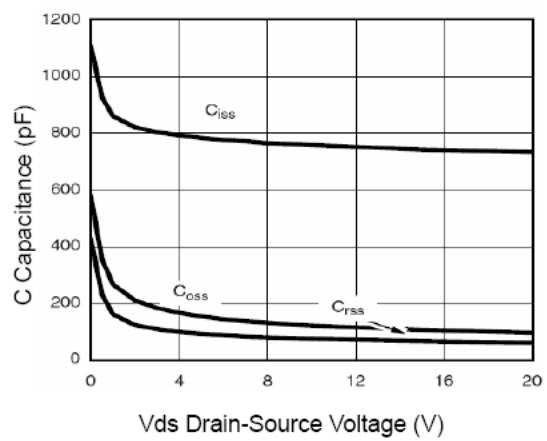


Figure 10 Capacitance vs Vds

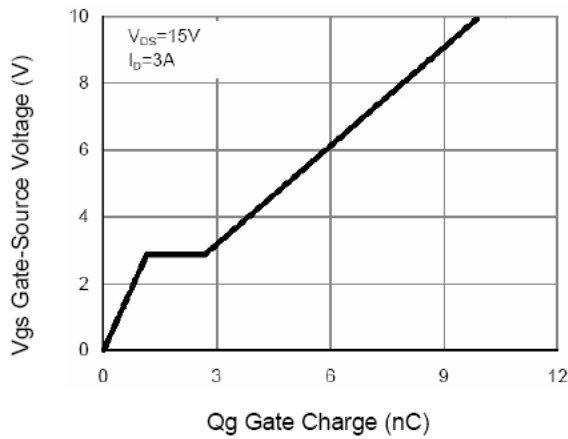


Figure 11 Gate Charge

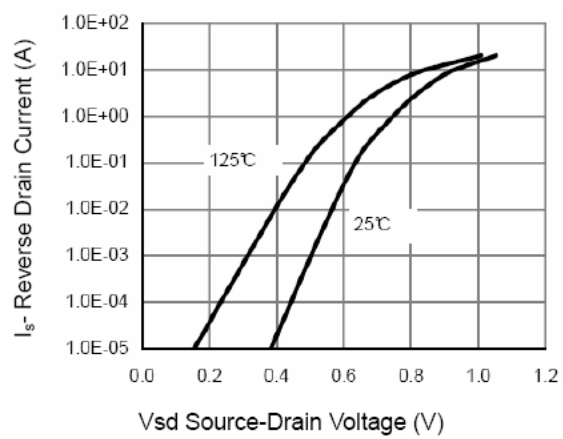


Figure 12 Source- Drain Diode Forward

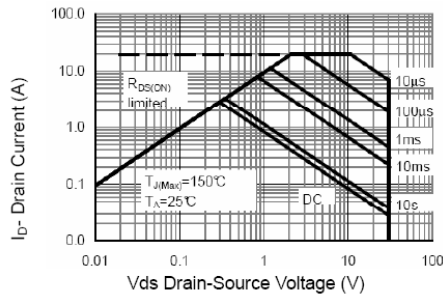


Figure 13 Safe Operation Area

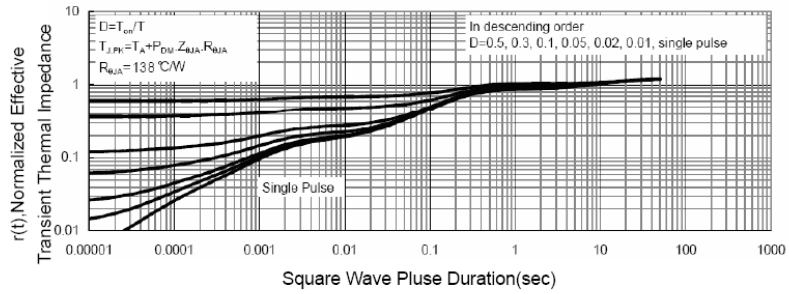


Figure 14 Normalized Maximum Transient Thermal Impedance