## Silicon N-Channel Power MOSFET

Features：

- $R_{DS(ON)}$ <14mΩ @ V_{GS}=10V (Typ11mΩ)

- High density cell design for ultra low R_{dson}

- Fully characterized avalanche voltage and current

- Excellent package for good heat dissipation

V_{DSS}	-30	V
I_D	-12	A
P_D	3.0	W
$R_{DS(ON)type}$	11	mΩ

Applications：

- Power switching application

- Hard switched and high frequency circuits

- Uninterruptible power supply

SOP-8
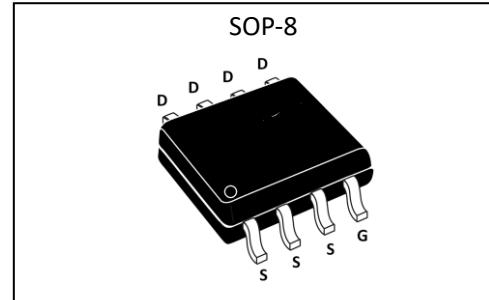
Inner Equivalent Principium Chart
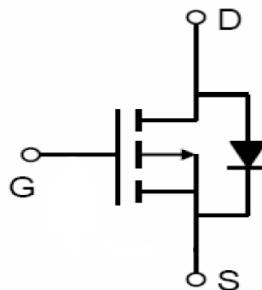
Absolute (Tc= 25℃ unless otherwise specified)：

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-30	V
I_D	Continuous Drain Current	-12	A
	Continuous Drain Current T_C = 70 °C	-10	A
I_{DM}[a1]	Pulsed Drain Current	-48	A
V_{GS}	Gate-to-Source Voltage	±20	V
Eas [a5]	L=0.5mH	140	mJ
dv/dt [a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	3.0	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Electrical Characteristics (Tc= 25℃ unless otherwise specified)：

OFF Characteristics

Symbol	Parameter	Test Conditions	Rating Min.	Rating Typ.	Rating Max.	Units
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	-30	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=-30V$, $V_{GS}=0V$, $T_a=25℃$	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-0.1	μA

ON Characteristics[a3]

Symbol	Parameter	Test Conditions	Rating Min.	Rating Typ.	Rating Max.	Units
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-10V$, $I_D=-10A$	--	11	14	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu A$	-1	--	-3.0	V

Pulse width $tp \le 380\mu s$, $\delta \le 2\%$

Dynamic Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating Min.	Rating Typ.	Rating Max.	Units
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-10A$	20	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V$, $V_{DS}=-15V$ f=1.0MHz	--	1800	--	pF
C_{oss}	Output Capacitance		--	220	--	pF
C_{rss}	Reverse Transfer Capacitance		--	180	--	pF

Resistive Switching Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating Min.	Rating Typ.	Rating Max.	Units
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-15V$, $I_D=-10A$ $V_{GS}=-10V$, $R_G=3\Omega$	--	10	--	ns
t_r	Rise Time		--	9	--	ns
$t_{d(OFF)}$	Turn-Off Delay Time		--	26	--	ns
t_f	Fall Time		--	11	--	ns
Q_g	Total Gate Charge	$V_{DD}=-15V$, $I_D=-10A$ $V_{GS}=-10V$	--	25	--	nC
Q_{gs}	Gate to Source Charge		--	4.0	--	nC
Q_{gd}	Gate to Drain（"Miller"）Charge		--	6	--	nC

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	-12	A
V_{SD}	Diode Forward Voltage[a3]	I_S=-12A,V_{GS}=0V	--	--	-1.5	V
t_{rr}	Reverse Recovery Time	I_S=-12A,T_j = 25°C	--	38	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us, V_{GS}=0V	--	30	--	nC

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	41.7	°C/W

[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.

[a2]: Surface Mounted on FR4 Board, t≤10sec.

[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

[a4]: Guaranteed by design, not subject to production

[a5]: T_J=25℃, V_{DD}=15V, V_G=10V,L=0.5Mh

Typical Electrical and Thermal Characteristics
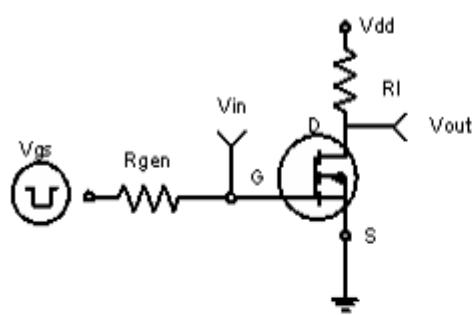
Figure 1:Switching Test Circuit
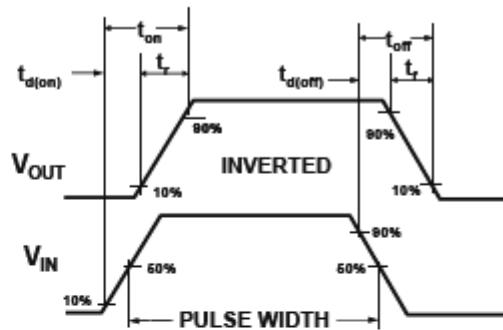
Figure 2:Switching Waveforms
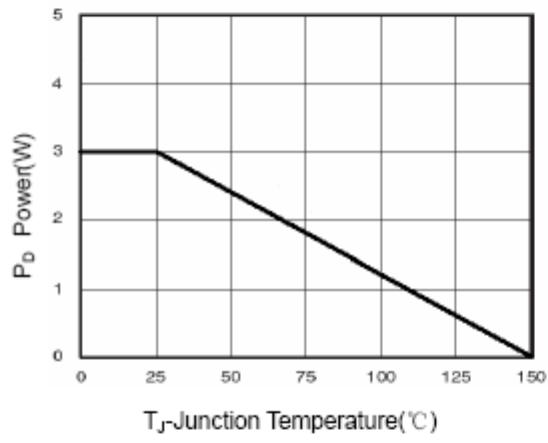
Figure 3 Power Dissipation
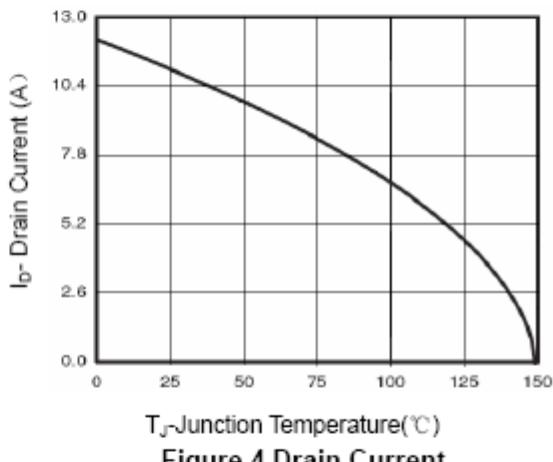
Figure 4 Drain Current
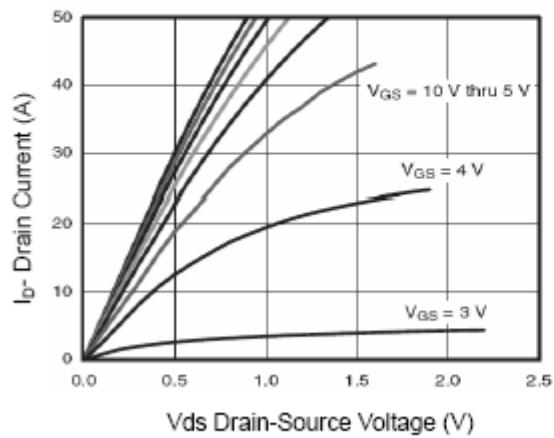
**Figure 5 Output Characteristics**
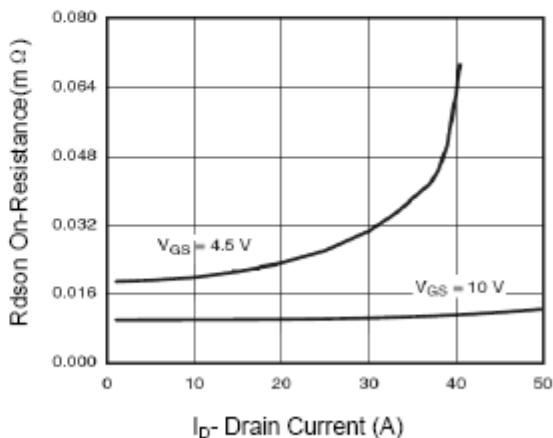

Figure 6 Drain-Source On-Resistance
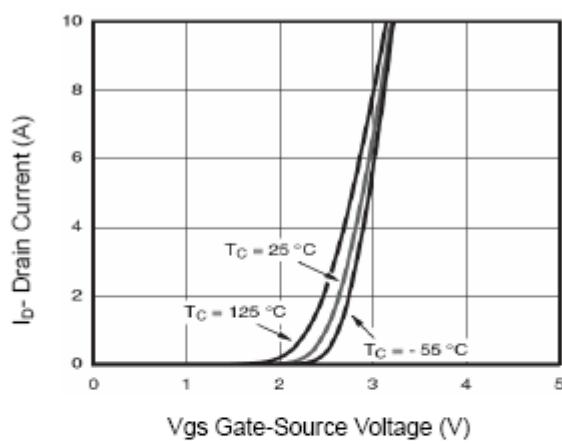
Figure 7 Transfer Characteristics

Figure 8 Drain-Source On-Resistance

Figure 9 Rdson vs Vgs
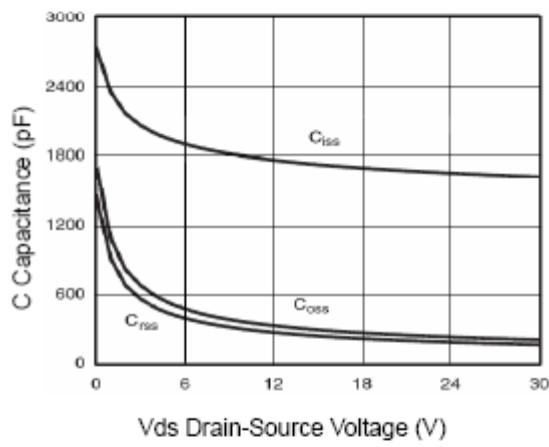
Figure 10 Capacitance vs Vds

Figure 11 Gate Charge
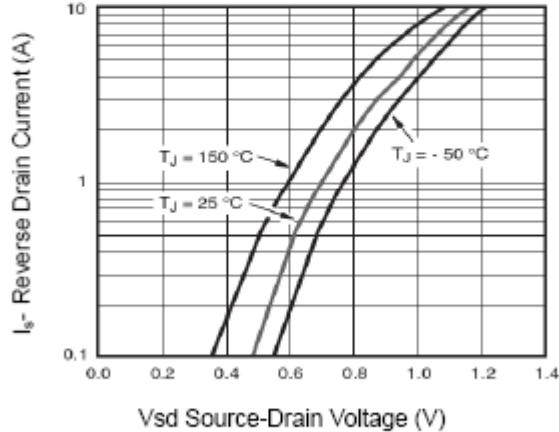
Figure 12 Source- Drain Diode Forward
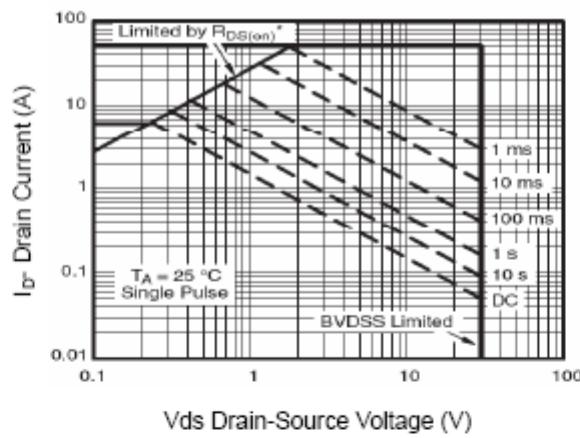
Figure 13 Safe Operation Area
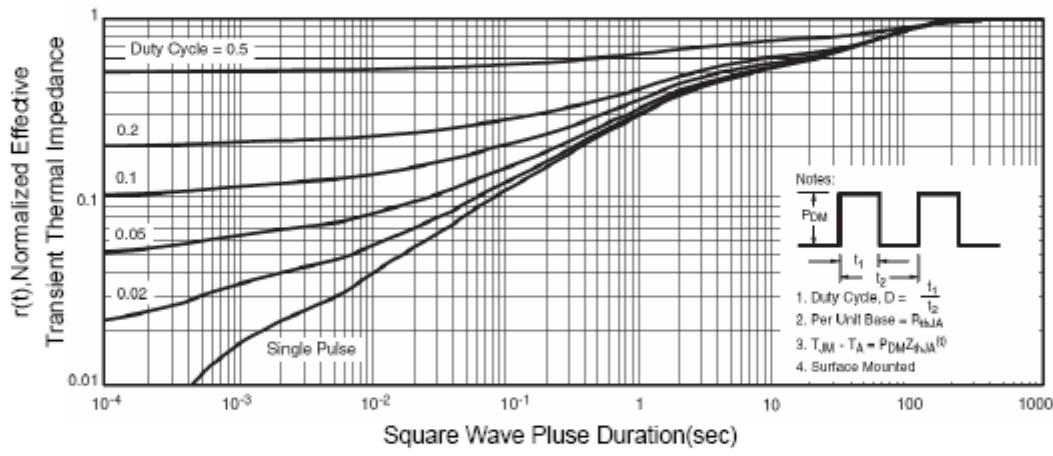
Figure 14 Normalized Maximum Transient Thermal Impedance