

N+P-Channel Power MOSFET

描述 / Descriptions

SOP-8 塑封封装互补增强模式 MOS 场效应管。

Complementary Enhancement MOSFET in a SOP-8 Plastic Package.

特征 / Features

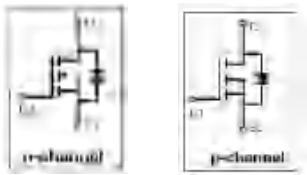
N-channel	P-channel
$V_{DS}(V)=20V$	$V_{DS}(V)=-20V$
$I_D=5.2A$	$I_D=-3A$
$R_{DS(ON)}<28m\Omega (V_{GS}=4.5V)$	$R_{DS(ON)}<110m\Omega (V_{GS}=-4.5V)$
$R_{DS(ON)}<37m\Omega (V_{GS}=2.5V)$	$R_{DS(ON)}<140m\Omega (V_{GS}=-2.5V)$

用途 / Applications

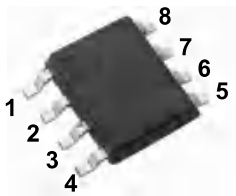
用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. This device is suitable for use as a load switch or in PWM applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : S2	PIN 2 : G2	PIN 3 : S1	PIN 4 : G1
PIN 5 : D1	PIN 6 : D1	PIN 7 : D2	PIN 8 : D2

N+P-Channel Power MOSFET

极限参数 / Absolute Maximum Ratings($T_A=25^\circ\text{C}$)

参数 Parameter	符号 Symbol	数值 Rating		单位 Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DSS}	± 20		V
Gate-Source Voltage	V_{GSS}	± 10		V
Continuous Drain Current ^A	$I_D (T_A=25^\circ\text{C})$	5.2	-3.0	A
	$I_D (T_A=70^\circ\text{C})$	4.0	-2.2	A
Pulsed Drain Current ^B	I_{DM}	± 16		A
Power Dissipation	$P_D (T_A=25^\circ\text{C})$	2		W
	$P_D (T_A=70^\circ\text{C})$	1.44		W
Maximum Junction-to-Ambient ^A	$R_{\theta JA}(t \leq 10\text{s})$	62.5		$^\circ\text{C}/\text{W}$
	$R_{\theta JA}$	110		$^\circ\text{C}/\text{W}$
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	60		$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150		$^\circ\text{C}$

Notes:

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

D: The static characteristics in Figures 1 to 6, 12, 14 are obtained using 80 μs pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The SOA curve provides a single pulse rating.

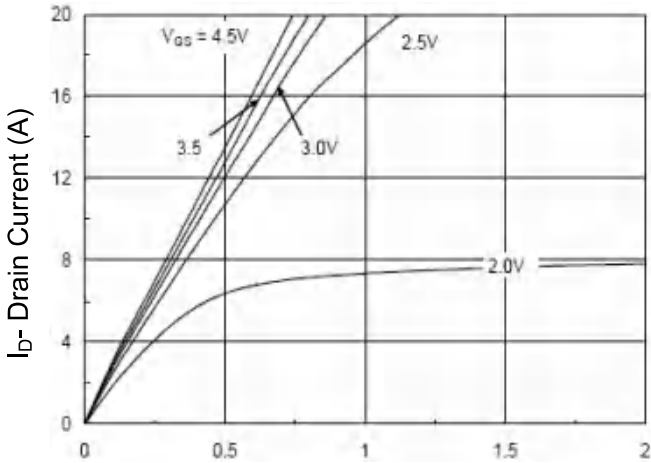
N+P-Channel Power MOSFET

N-沟道电性能参数/N-CHANNEL Electrical Characteristics(Ta=25°C)

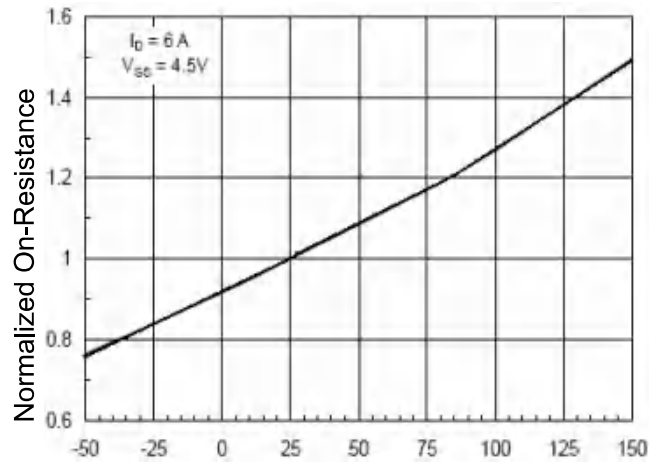
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	22	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=6A$	-	22	28	m Ω
		$V_{GS}=2.5V, I_D=5A$	-	27	37	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=6A$	20	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$	-	640	-	PF
Output Capacitance	C_{oss}		-	140	-	PF
Reverse Transfer Capacitance	C_{rss}		-	80	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A$ $V_{GEN}=4.5V, R_G=6\Omega$	-	8	-	nS
Turn-on Rise Time	t_r		-	9	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	nS
Turn-Off Fall Time	t_f		-	4	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=3A,$ $V_{GS}=4.5V$	-	10	-	nC
Gate-Source Charge	Q_{gs}		-	1.5	-	nC
Gate-Drain Charge	Q_{gd}		-	1.6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1.7A$	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	6	A

N+P-Channel Power MOSFET

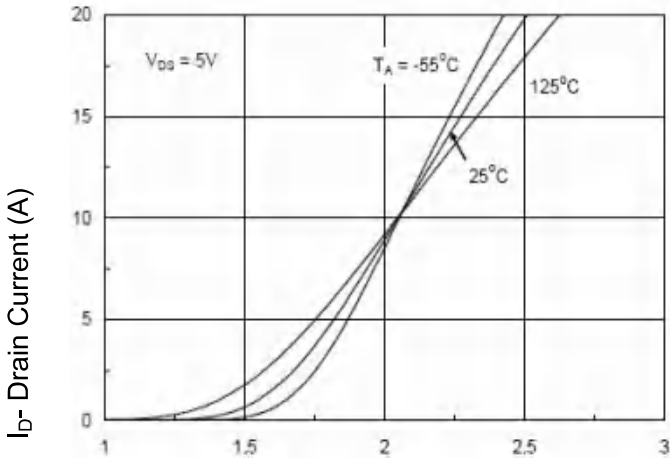
N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve



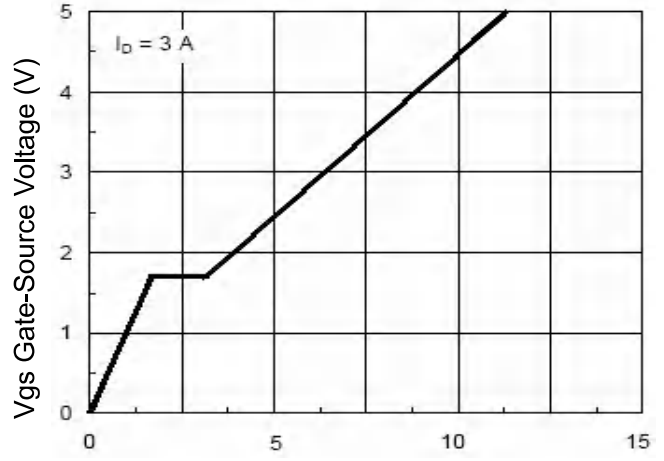
Vds Drain-Source Voltage (V)
Figure 1 Output Characteristics



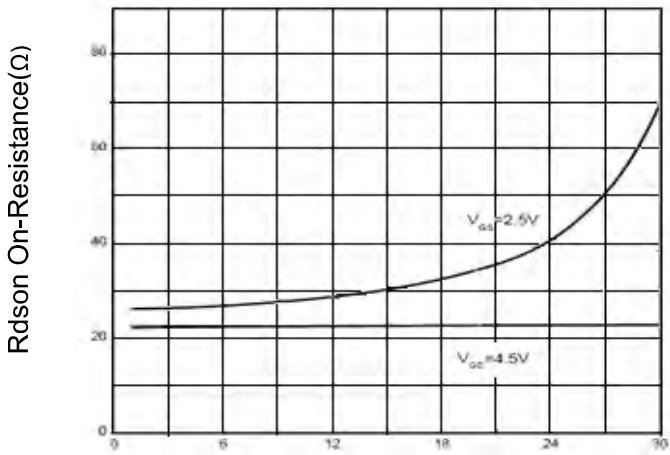
T_J -Junction Temperature(°C)
Figure 4 Rdson-Junction Temperature



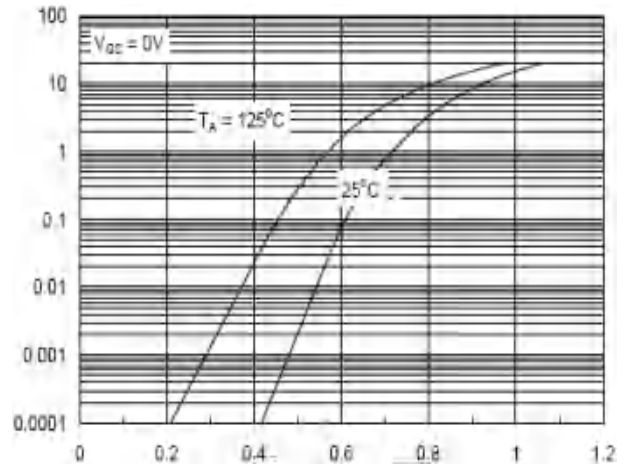
Vgs Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



Qg Gate Charge (nC)
Figure 5 Gate Charge

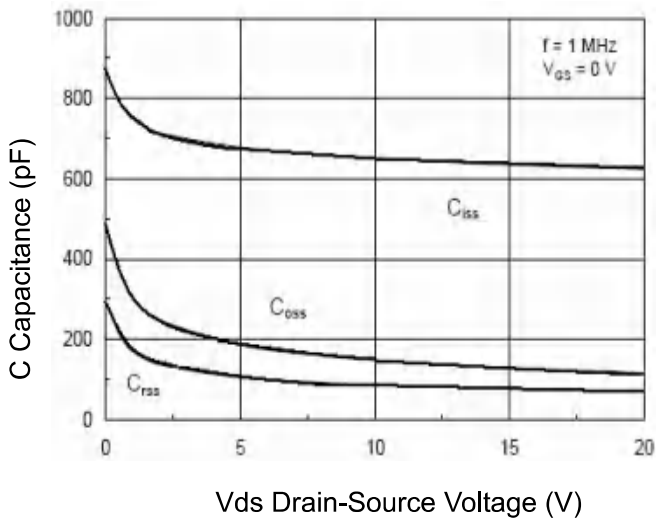


I_D - Drain Current (A)
Figure 3 Rdson- Drain Current

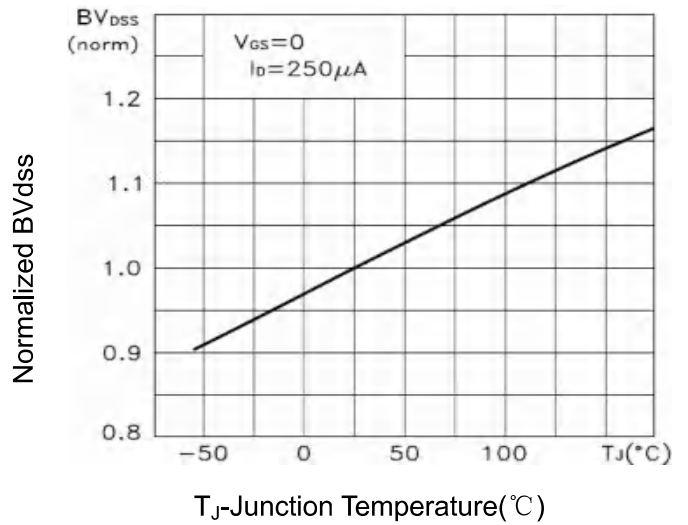


Vsd Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward

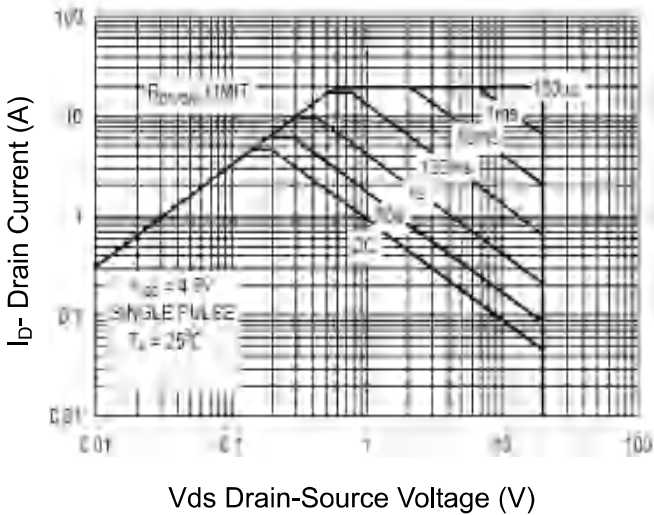
N+P-Channel Power MOSFET



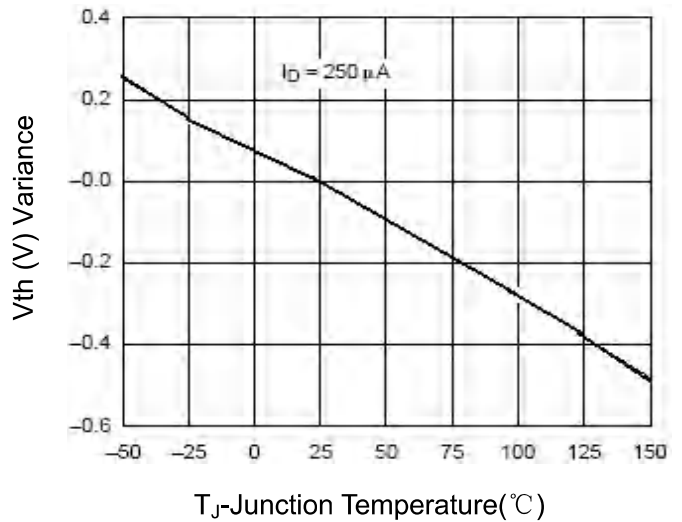
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



T_J-Junction Temperature(°C)
Figure 9 BV_{DSS} vs Junction Temperature



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature

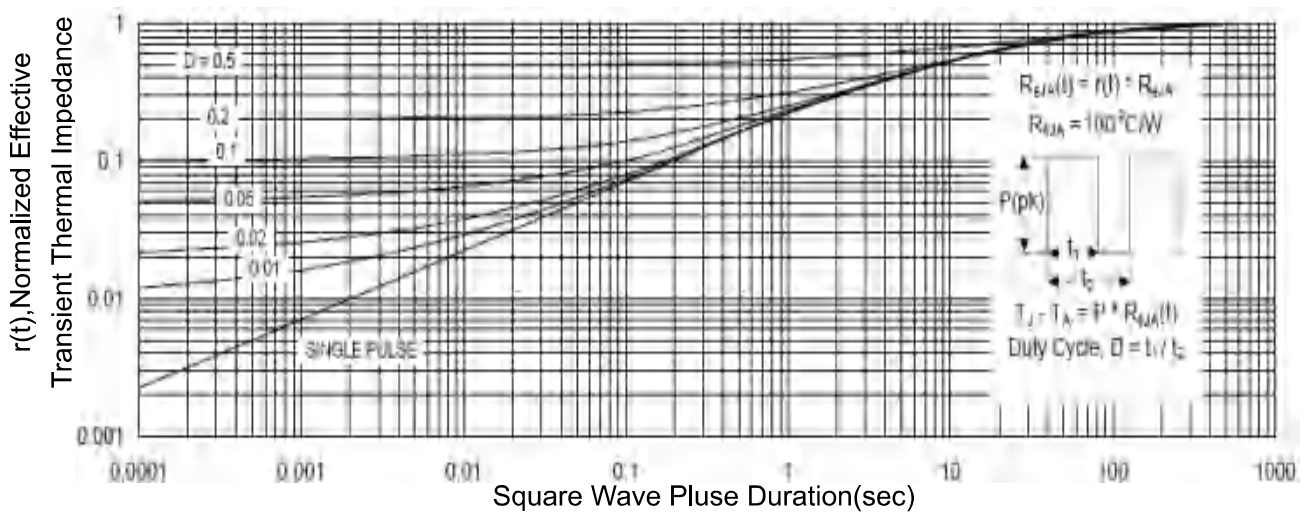


Figure 11 Normalized Maximum Transient Thermal Impedance

N+P-Channel Power MOSFET

P-沟道电性能参数/P-CHANNEL Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3A$	-	66	110	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	-	95	140	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-2A$	5	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{ISS}	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$	-	405	-	PF
Output Capacitance	C_{OSS}		-	75	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	55	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A$ $V_{GS}=-4.5V, R_{GEN}=10\Omega$	-	11	-	nS
Turn-on Rise Time	t_r		-	35	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-3A,$ $V_{GS}=-2.5V$	-	3.3	12	nC
Gate-Source Charge	Q_{GS}		-	0.7	-	nC
Gate-Drain Charge	Q_{gd}		-	1.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1.3A$	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-3	A

N+P-Channel Power MOSFET

P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve

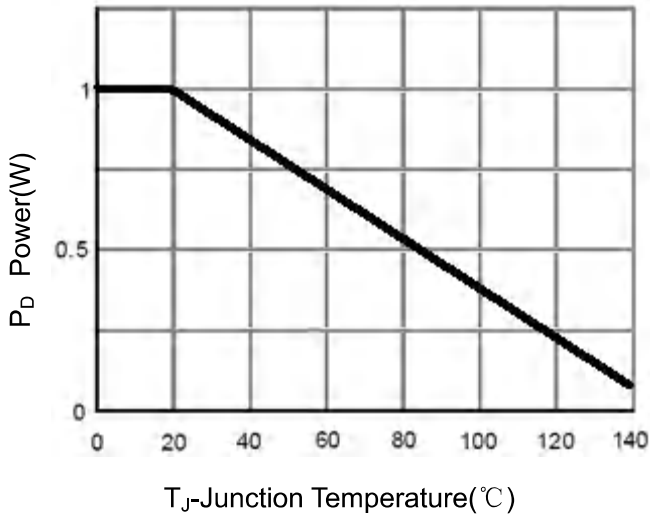


Figure 1 Power Dissipation

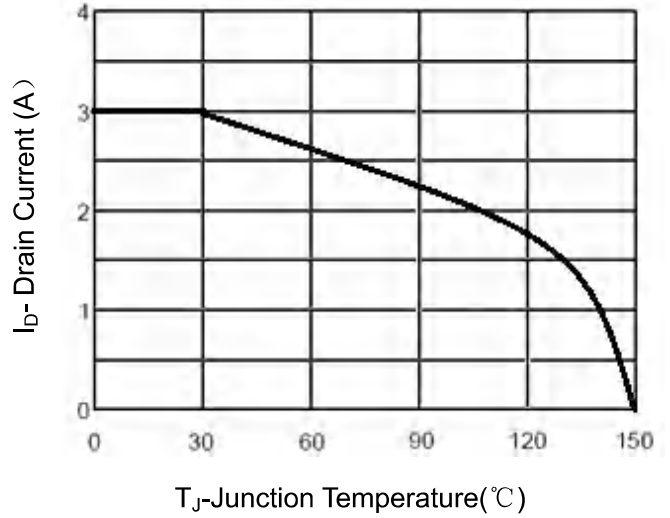


Figure 2 Drain Current

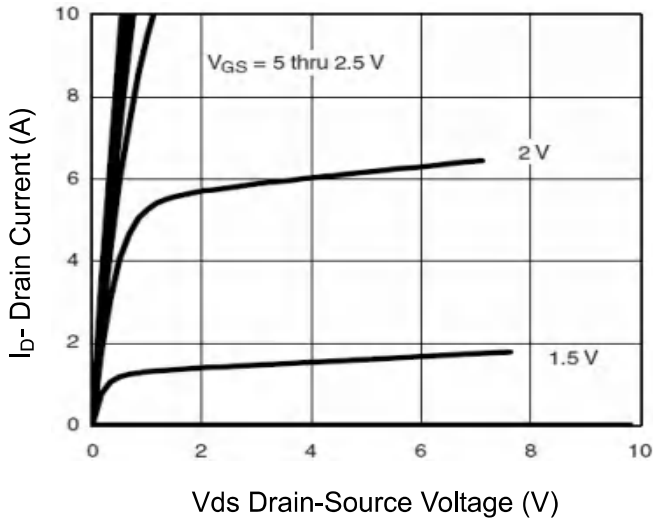


Figure 3 Output Characteristics

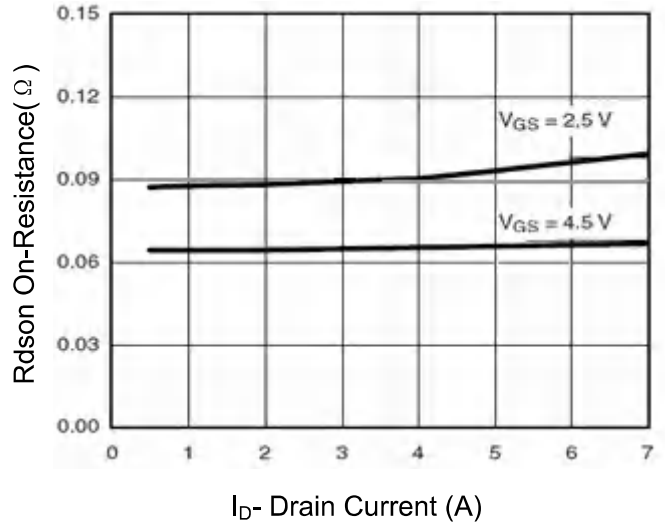


Figure 4 Drain-Source On-Resistance

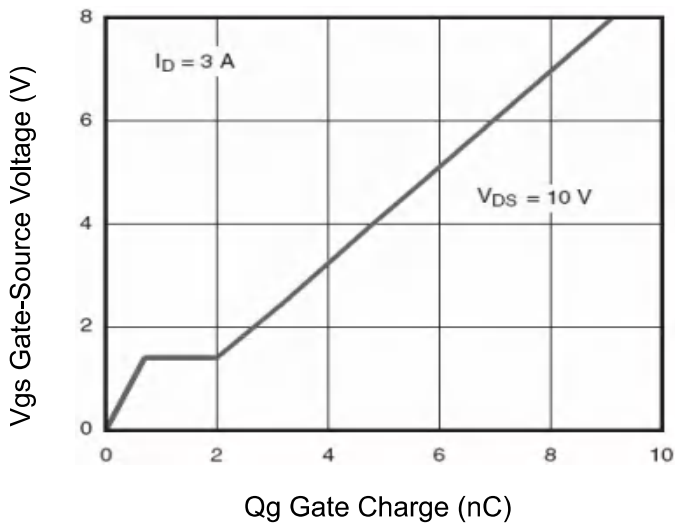


Figure 5 Gate Charge

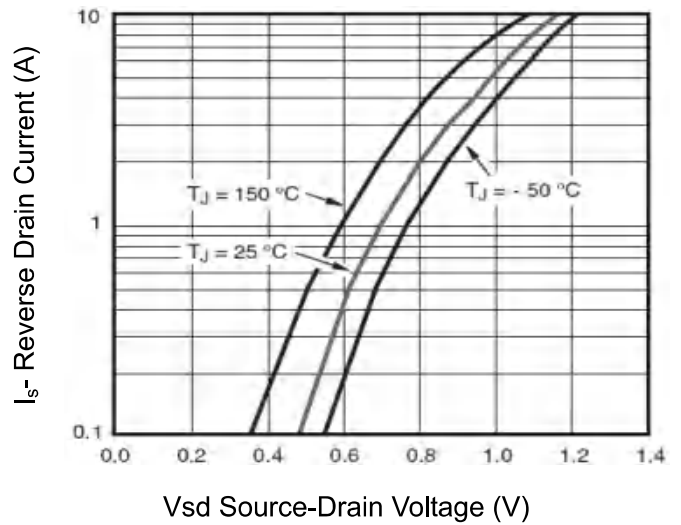
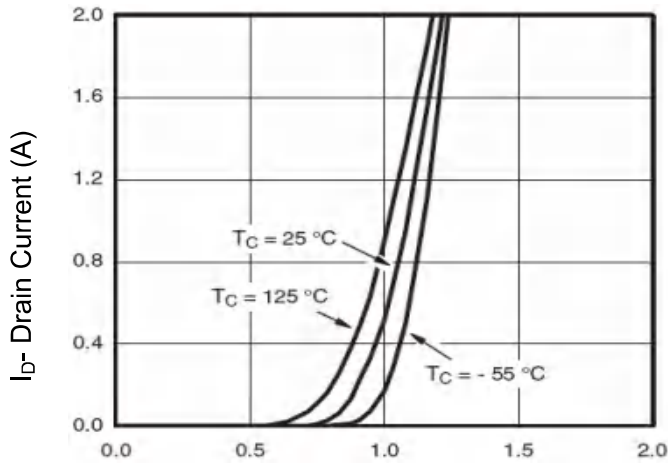
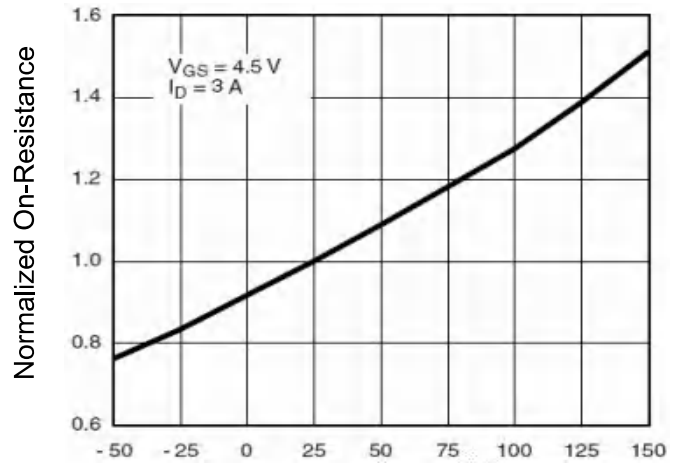


Figure 6 Source- Drain Diode Forward

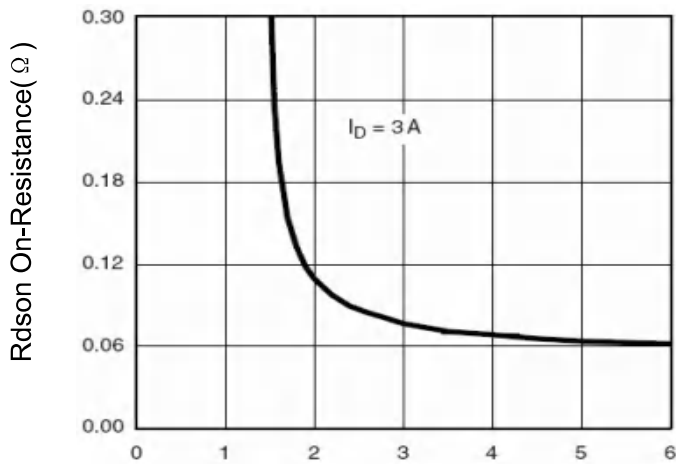
N+P-Channel Power MOSFET



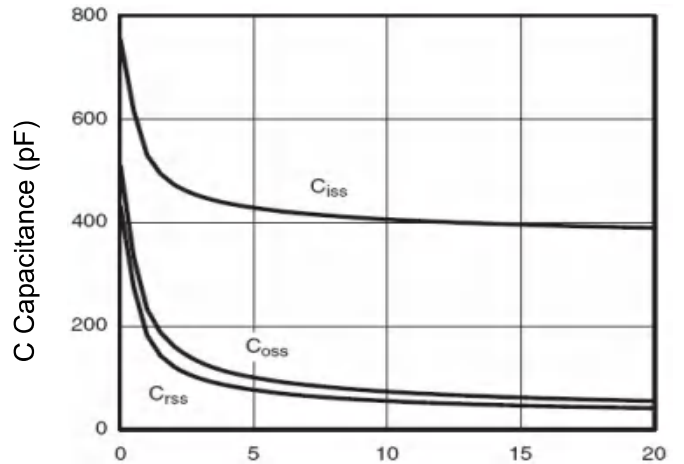
Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



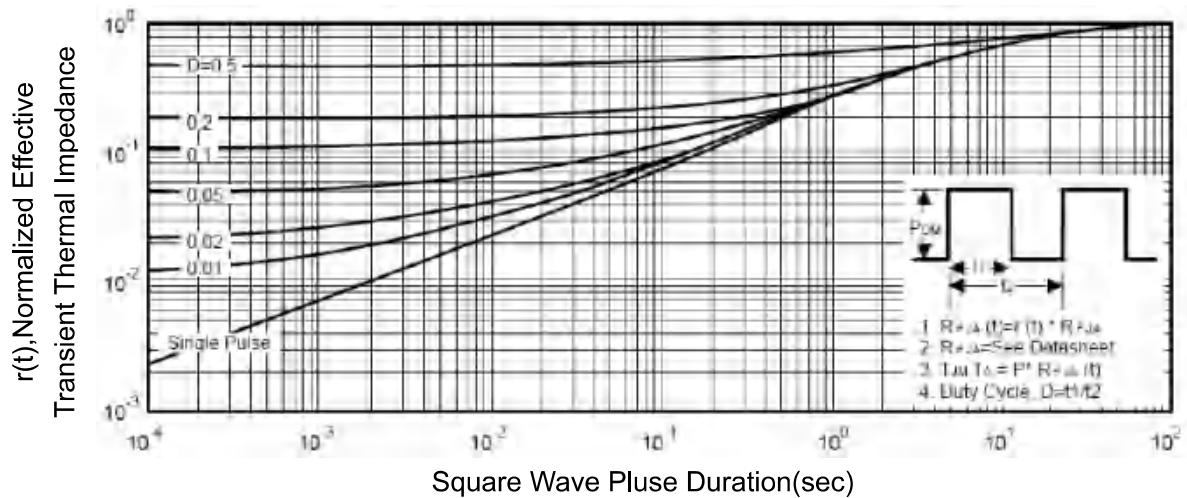
T_J -Junction Temperature($^\circ\text{C}$)
Figure 8 Drain-Source On-Resistance



Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds



Square Wave Pluse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance

N+P-Channel Power MOSFET

外形尺寸图 / Package Dimensions

SOP-8

Unit:mm

