

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.

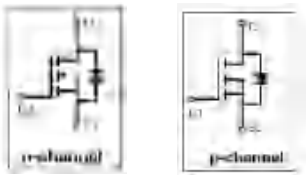
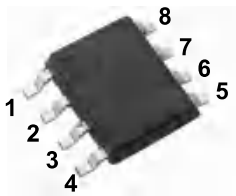
特征 / Features

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	$I_{\text{D}} (T_A=25^{\circ}\text{C})$	5.2	-3.0	A
	$I_{\text{D}} (T_A=70^{\circ}\text{C})$	4.0	-2.2	A
Pulsed Drain Current ^B	I_{DM}	± 16		A
Power Dissipation	$P_{\text{D}} (T_A=25^{\circ}\text{C})$	2		W
	$P_{\text{D}} (T_A=70^{\circ}\text{C})$	1.44		W
Maximum Junction-to-Ambient ^A	$R_{\theta\text{JA}} (t \leq 10\text{s})$	62.5		$^{\circ}\text{C/W}$
	$R_{\theta\text{JA}}$	110		$^{\circ}\text{C/W}$
Maximum Junction-to-Lead ^C	$R_{\theta\text{JL}}$	60		$^{\circ}\text{C/W}$
Junction and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	-55 to +150		$^{\circ}\text{C}$

Notes:

A: The value of $R_{\theta\text{JA}}$ 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 $R_{\theta\text{JA}}$ is the sum of the thermal impedance from junction to lead $R_{\theta\text{JL}}$ 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 =250μA	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} =±10V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6A	-	22	28	mΩ
		V _{GS} =2.5V, I _D =5A	-	27	37	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6A	20	-	-	S
Dynamic Characteristics (Note4)						
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 =6Ω	-	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

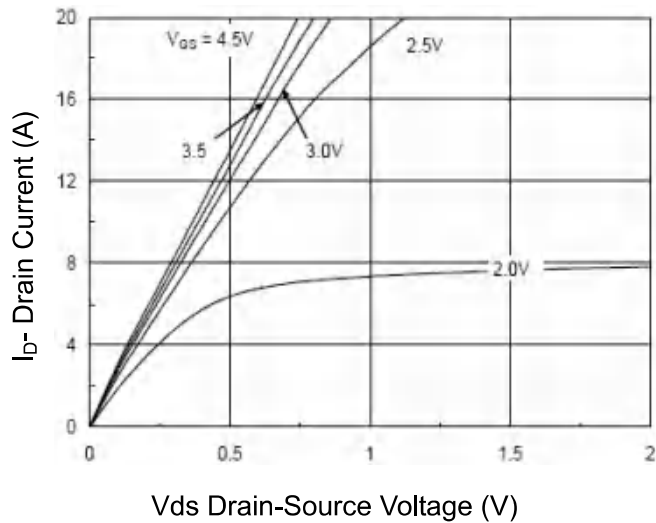


Figure 1 Output Characteristics

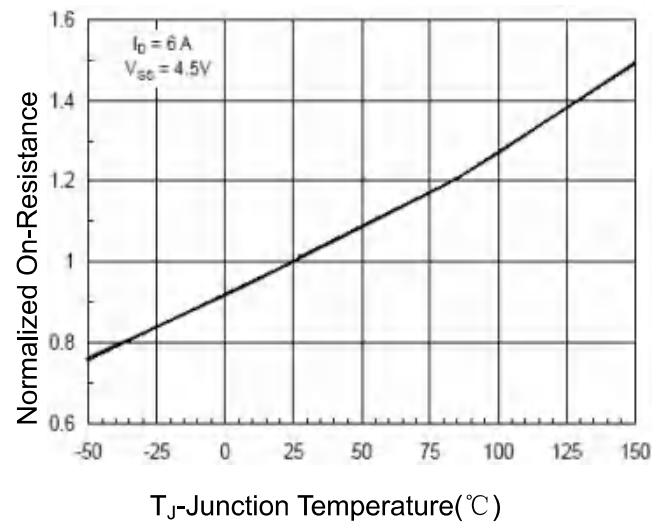


Figure 4 Rds(on)-Junction Temperature

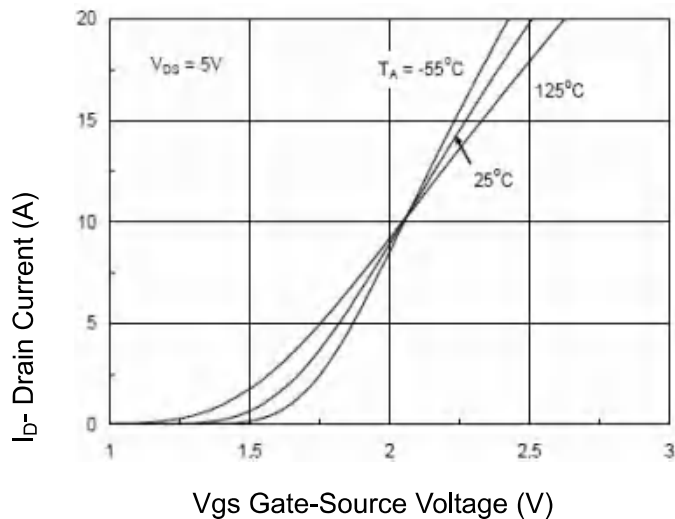


Figure 2 Transfer Characteristics

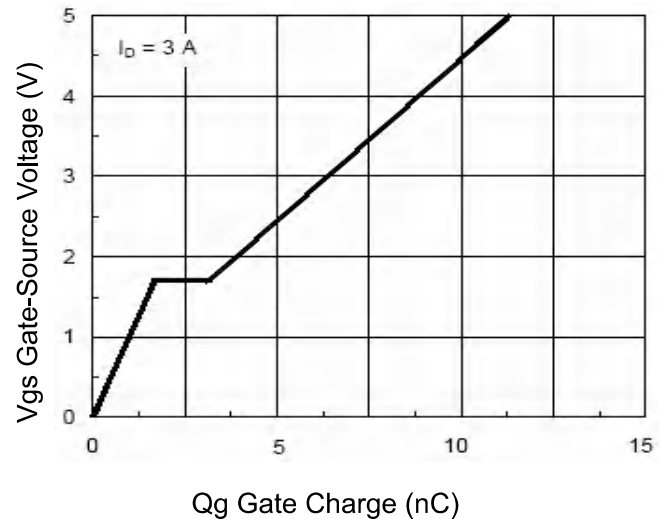


Figure 5 Gate Charge

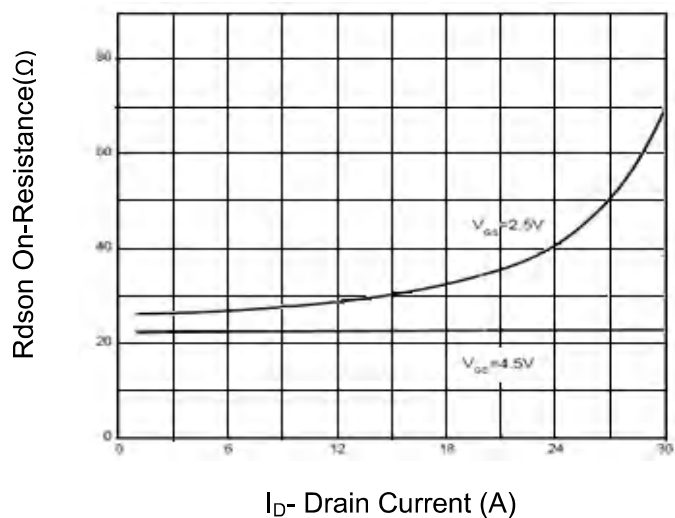


Figure 3 Rds(on)- Drain Current

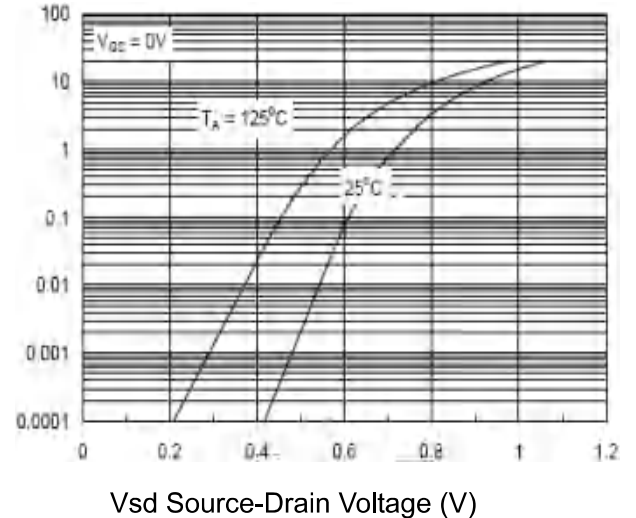
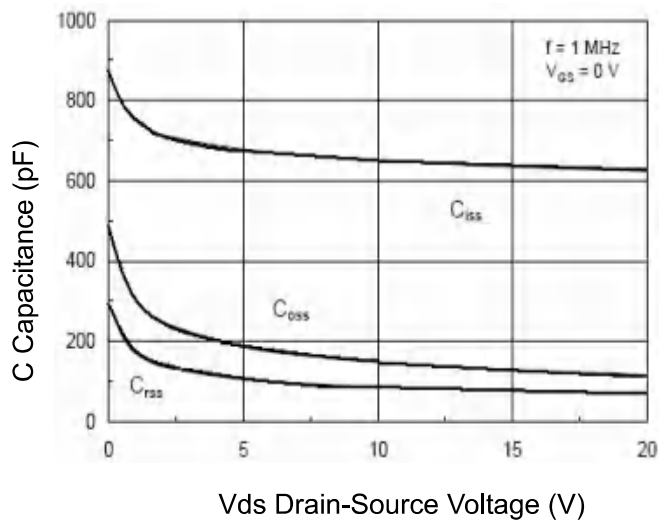
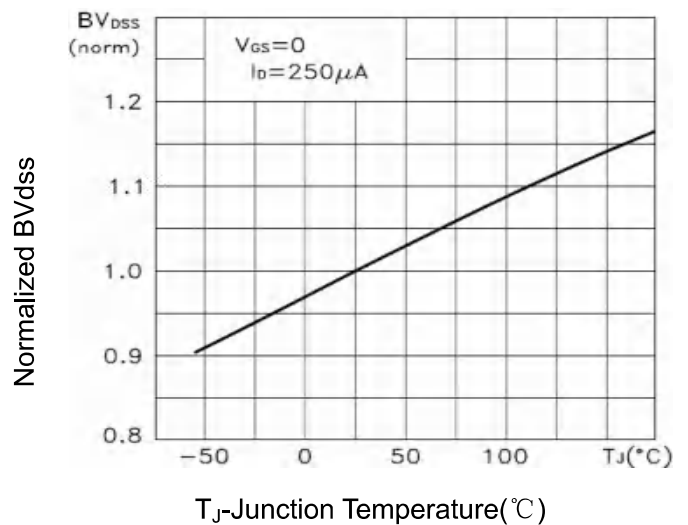


Figure 6 Source- Drain Diode Forward

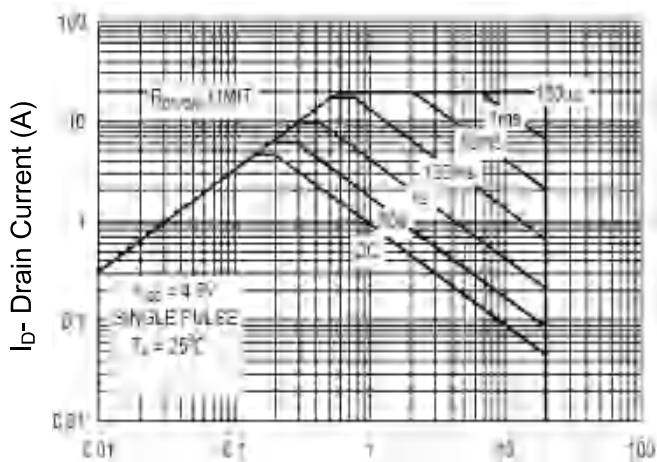
N+P-Channel Power MOSFET



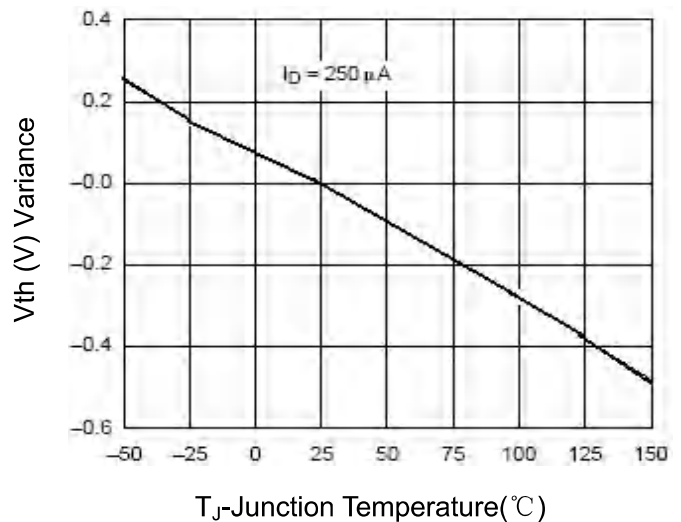
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



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

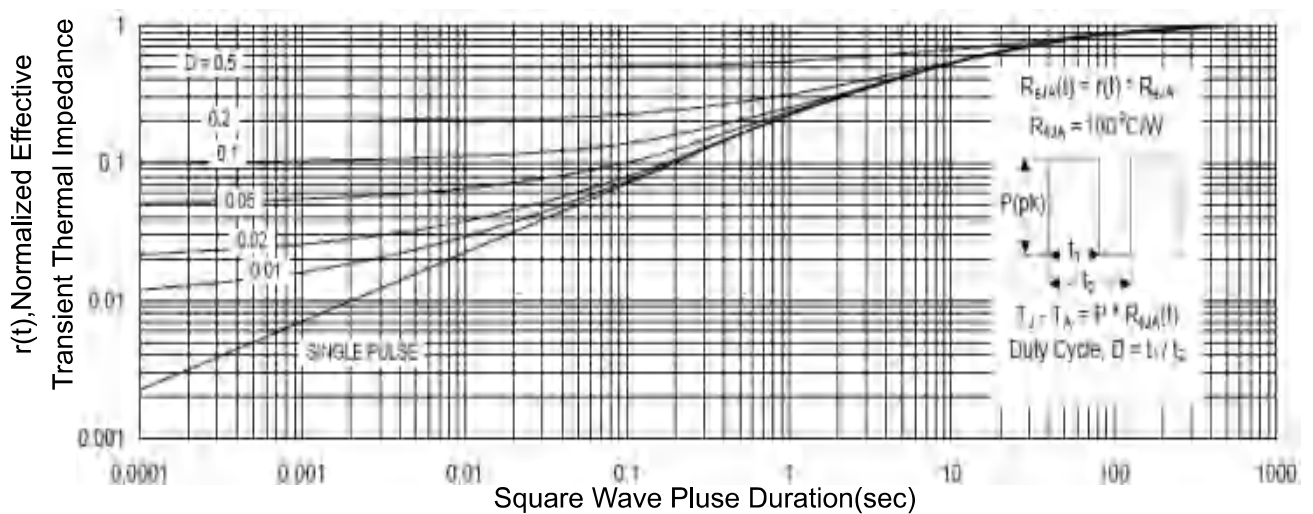


Figure 11 Normalized Maximum Transient Thermal Impedance

N+P-Channel Power MOSFET**P-沟道电性能参数/P-CHANNEL Electrical Characteristics(Ta=25℃)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-0.4	-0.7	-1	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-3A	-	66	110	mΩ
		V _{GS} =-2.5V, I _D =-2A	-	95	140	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V,I _D =-2A	5	-	-	S
Dynamic Characteristics (Note4)						
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} =10Ω	-	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

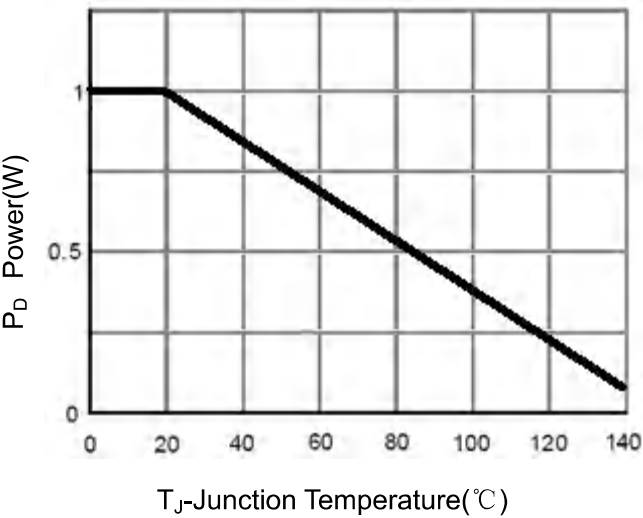


Figure 1 Power Dissipation

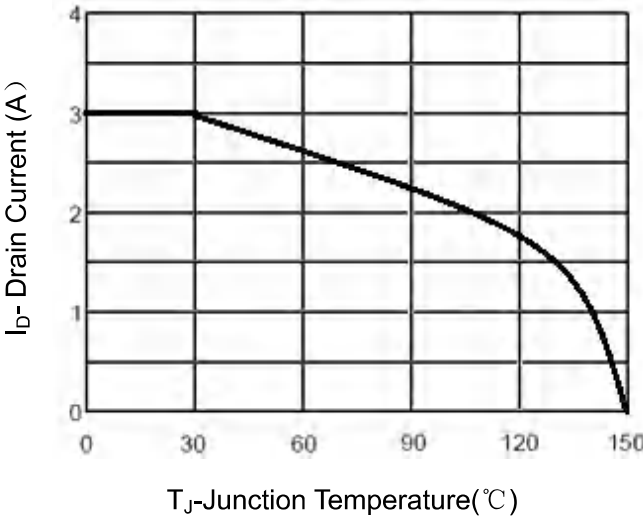


Figure 2 Drain Current

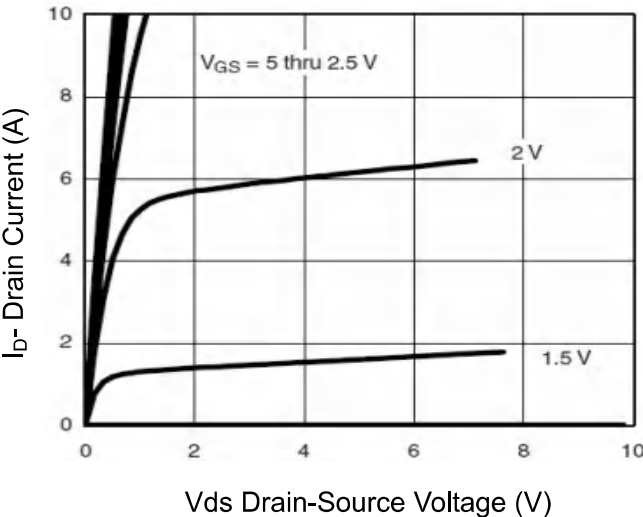


Figure 3 Output Characteristics

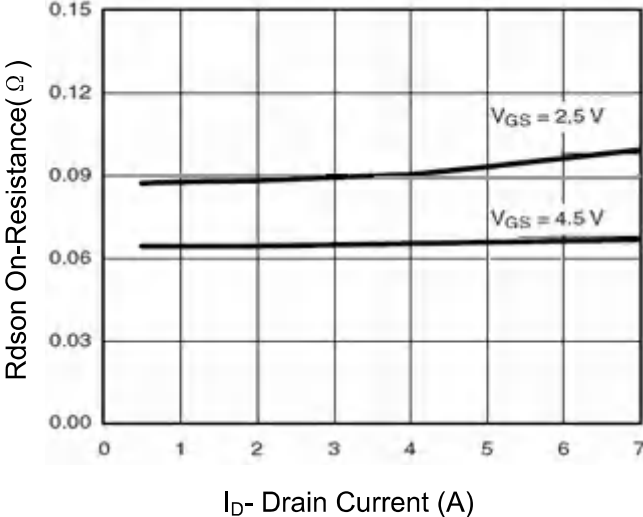


Figure 4 Drain-Source On-Resistance

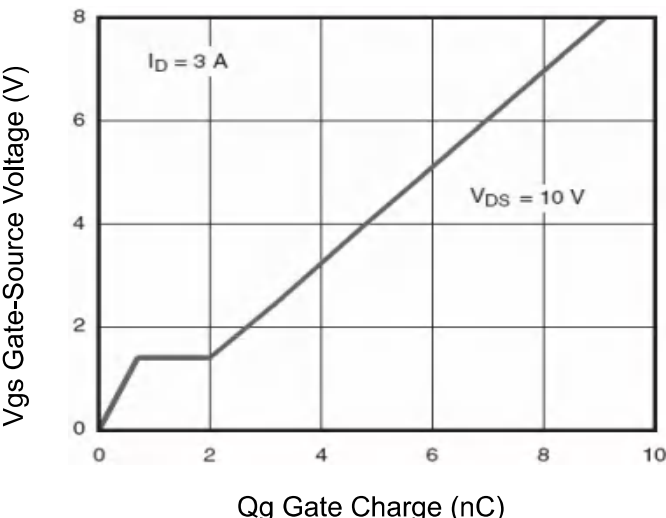


Figure 5 Gate Charge

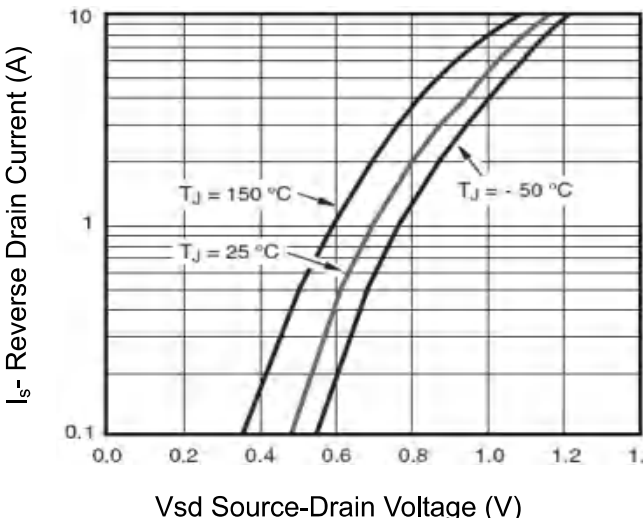


Figure 6 Source- Drain Diode Forward

N+P-Channel Power MOSFET

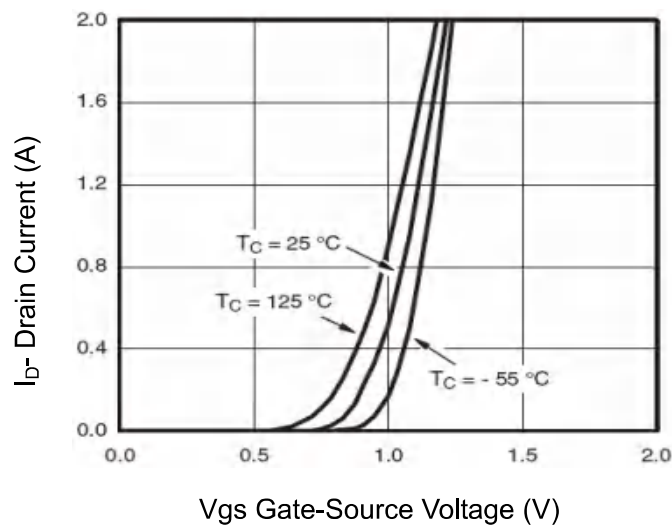


Figure 7 Transfer Characteristics

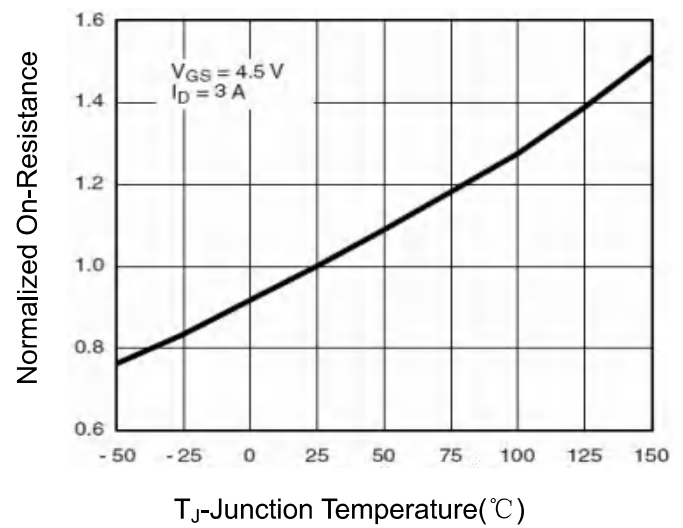


Figure 8 Drain-Source On-Resistance

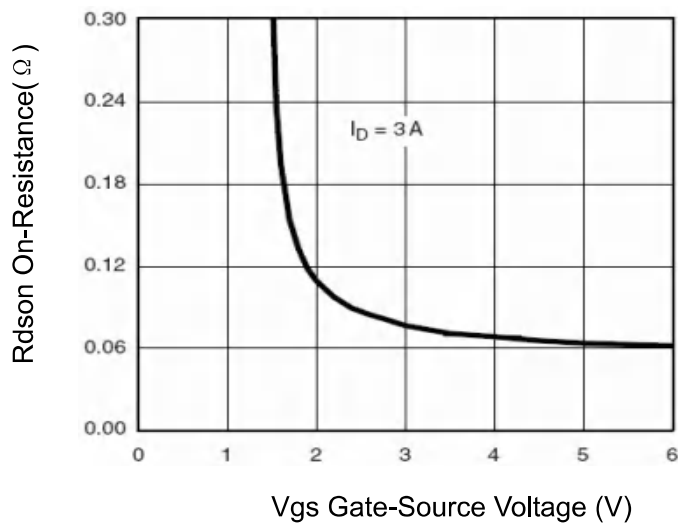
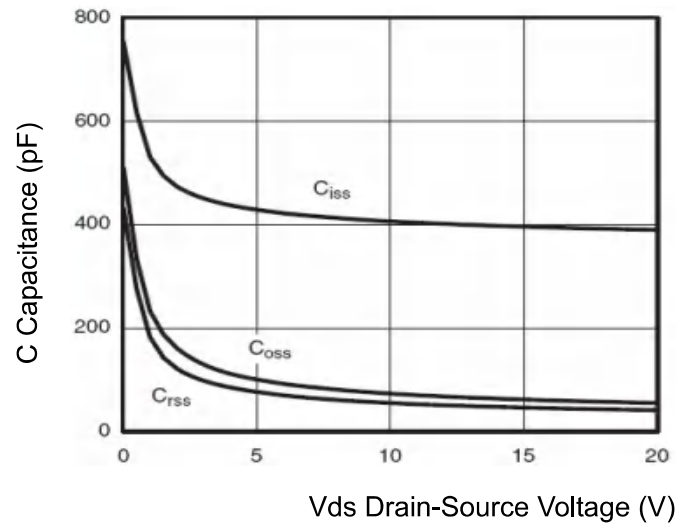
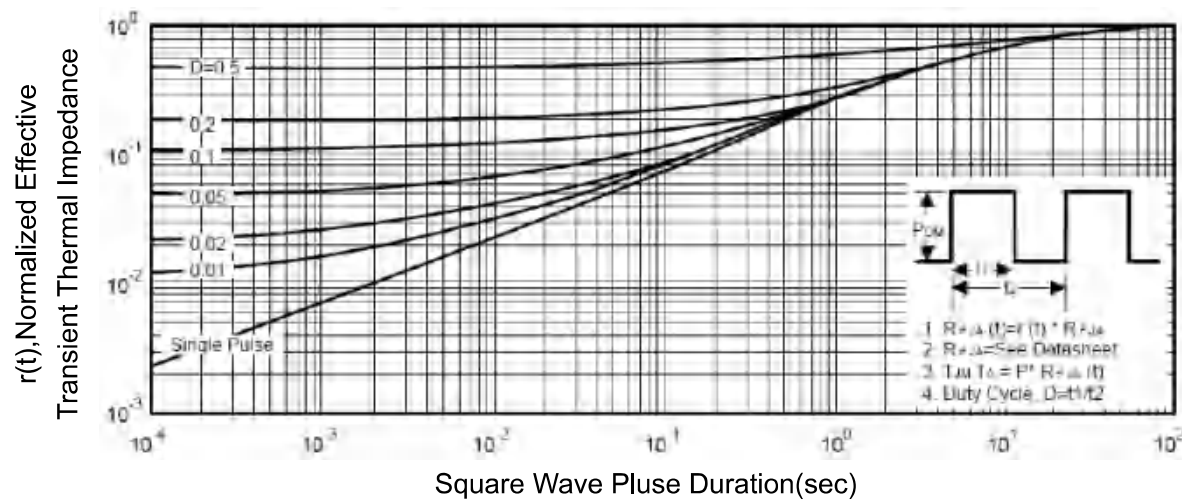
Figure 9 $R_{DS(on)}$ vs V_{GS} Figure 10 Capacitance vs V_{DS} 

Figure 11 Normalized Maximum Transient Thermal Impedance

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外形尺寸图 / Package Dimensions

SOP-8

Unit:mm

