



## PE2606

### DESCRIPTION

The PE2606 uses advanced trench technology MOSFET to provide excellent  $R_{DS(ON)}$  and low gate charge. The complementary MOSFET may be used in power inverters, and other applications.

### GENERAL FEATURES

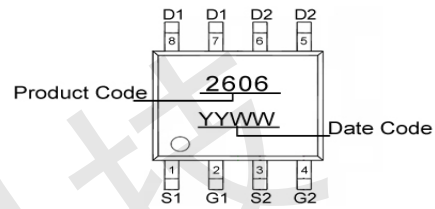
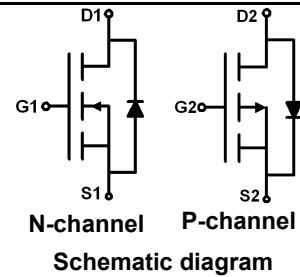
#### ● N-Channel

$V_{DS} = 20V, I_D = 6.8A$   
 $R_{DS(ON)} < 21m\Omega @ V_{GS}=4.5V$   
 $R_{DS(ON)} < 28m\Omega @ V_{GS}=2.5V$

#### ● P-Channel

$V_{DS} = -20V, I_D = -7A$   
 $R_{DS(ON)} < 35m\Omega @ V_{GS}=-4.5V$   
 $R_{DS(ON)} < 45m\Omega @ V_{GS}=-2.5V$

- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package



### ABSOLUTE MAXIMUM RATINGS( $T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		$V_{DS}$	20	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 12$	$\pm 12$	V
Continuous Drain Current	$T_A=25^\circ C$	$I_D$	6.8	-7	A
	$T_A=70^\circ C$		4.5	-4.8	
Pulsed Drain Current (Note 1)		$I_{DM}$	20	-22	A
Maximum Power Dissipation	$T_A=25^\circ C$	$P_D$	2.0	2.0	W
	$T_A=70^\circ C$		1.44	1.44	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 To 150	-55 To 150	$^\circ C$

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	$^\circ C/W$
		P-Ch	62.5	



**N-CHANNEL Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	20	22	-	V

Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.65	1.2	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.0A	-	17	21	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.0 A	-	21	28	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4A	-	10	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =8V, V <sub>GS</sub> =0V, F=1.0MHz	-	500	-	PF
Output Capacitance	C <sub>OSS</sub>		-	300	-	PF
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	140	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =1A V <sub>GS</sub> =4.5V, R <sub>GEN</sub> =6Ω	-	20	40	nS
Turn-on Rise Time	t <sub>r</sub>		-	18	40	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	60	108	nS
Turn-Off Fall Time	t <sub>f</sub>		-	28	56	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3A, V <sub>GS</sub> =4.5V	-	10	15	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.3	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	2.9	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A	-	-	1.2	V
Diode Forward Current (Note 2)	I <sub>S</sub>		-	-	4.5	A

**P-CHANNEL Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

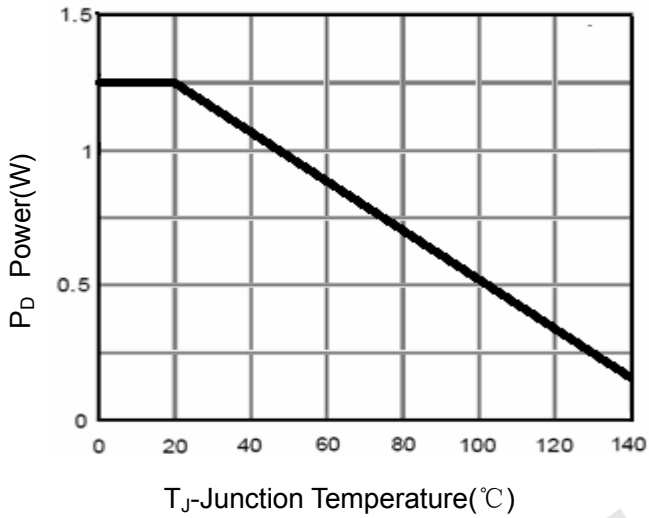
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-	-18	-	V



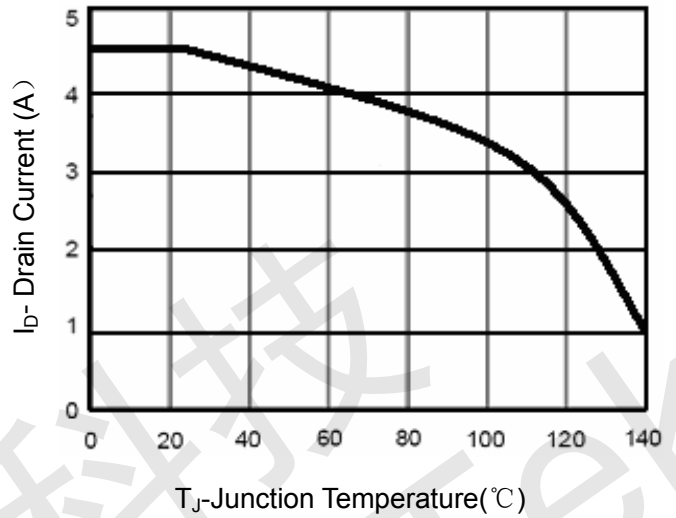
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.6	-0.8	-1.4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-6.5A$	-	25	35	m $\Omega$
		$V_{GS}=-2.5V, I_D=-5A$	-	35	45	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=3A$	-	10	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$	-	2100	-	PF
Output Capacitance	$C_{oss}$		-	450	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	300	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A,$ $V_{GS}=-4.5V, R_{GEN}=6\Omega$	-	25	-	nS
Turn-on Rise Time	$t_r$		-	30	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	$t_f$		-	50	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-10V, I_D=-6.5A, V_{GS}=-4.5V$	-	17	-	nC
Gate-Source Charge	$Q_{gs}$		-	4.1	-	nC
Gate-Drain Charge	$Q_{gd}$		-	4.3	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-7A$	-	-	-1.2	V



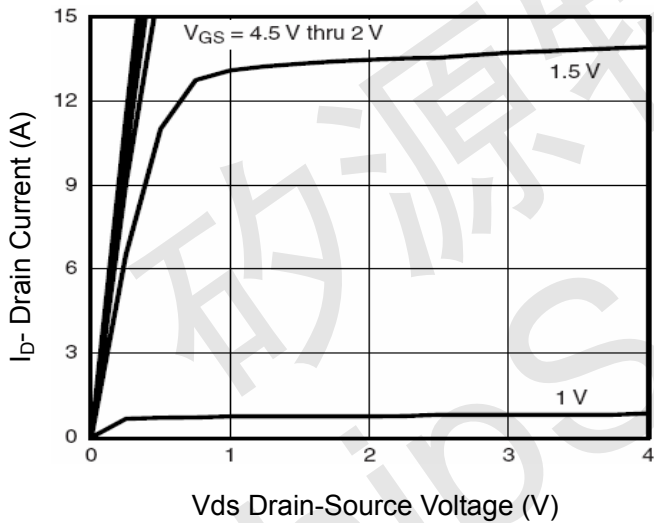
### N-CHANNEL Typical Electrical and Thermal Characteristics



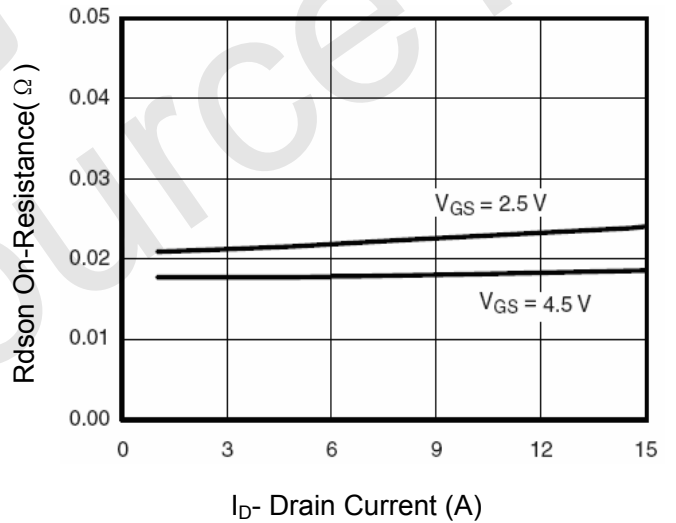
T<sub>J</sub>-Junction Temperature(°C)  
**Figure 1 Power Dissipation**



T<sub>J</sub>-Junction Temperature(°C)  
**Figure 2 Drain Current**



V<sub>DS</sub> Drain-Source Voltage (V)  
**Figure 3 Output Characteristics**



I<sub>D</sub>- Drain Current (A)  
**Figure 4 Drain-Source On-Resistance**

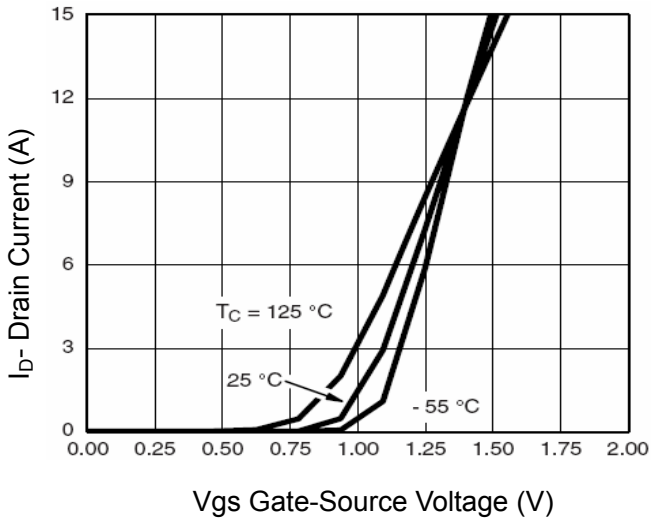


Figure 5 Transfer Characteristics

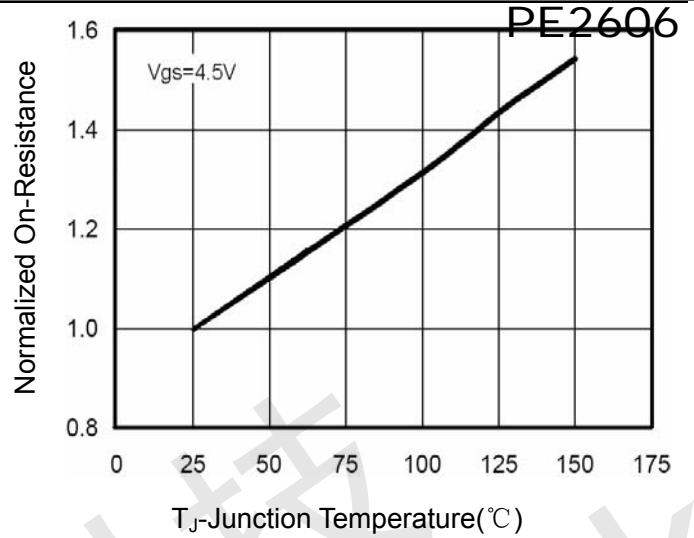


Figure 6 Drain-Source On-Resistance

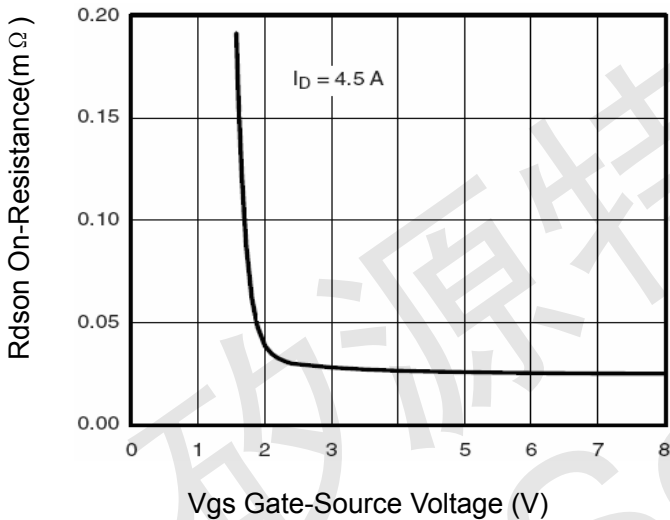


Figure 7  $R_{dson}$  vs.  $V_{gs}$

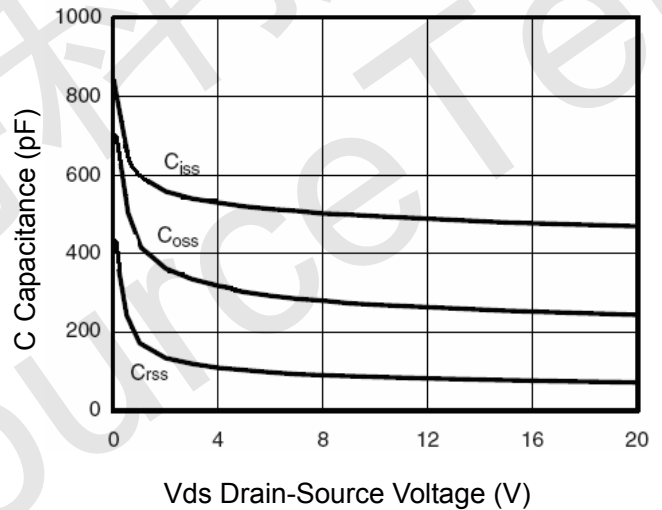


Figure 8 Capacitance vs  $V_{ds}$

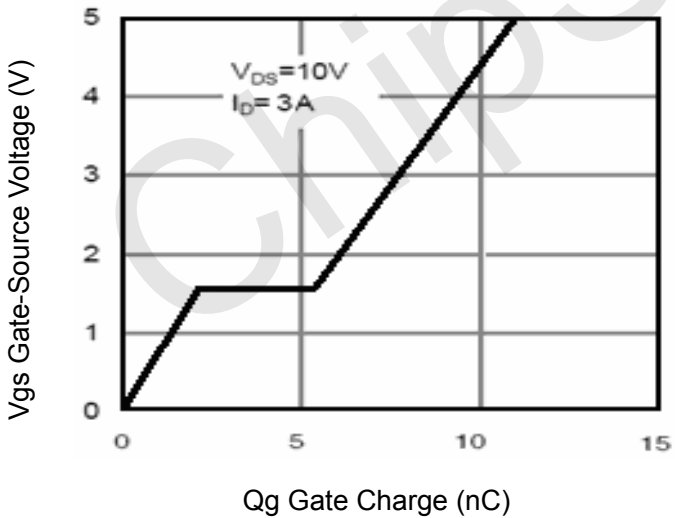


Figure 9 Gate Charge

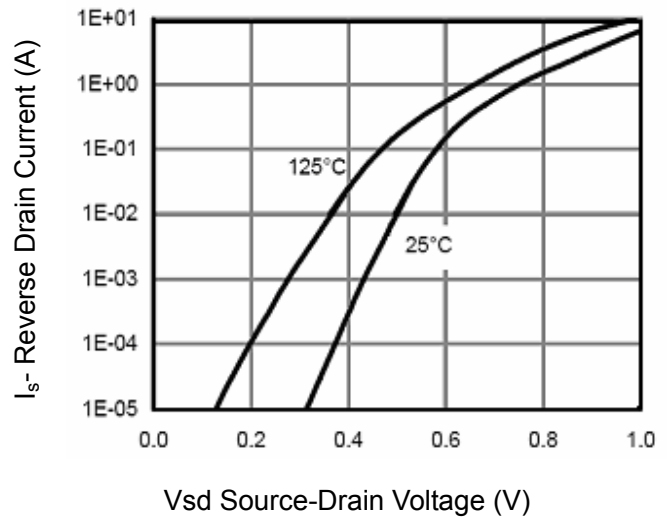


Figure 10 Source- Drain Diode Forward



P-CHANNEL Typical Electrical and Thermal Characteristics

PE2606

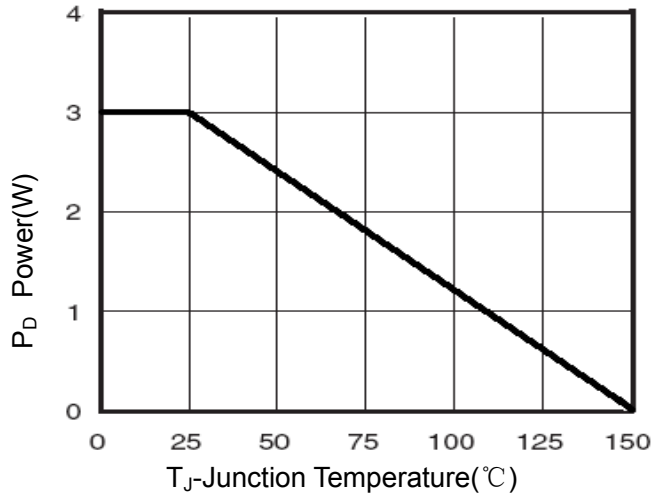


Figure 1 Power Dissipation

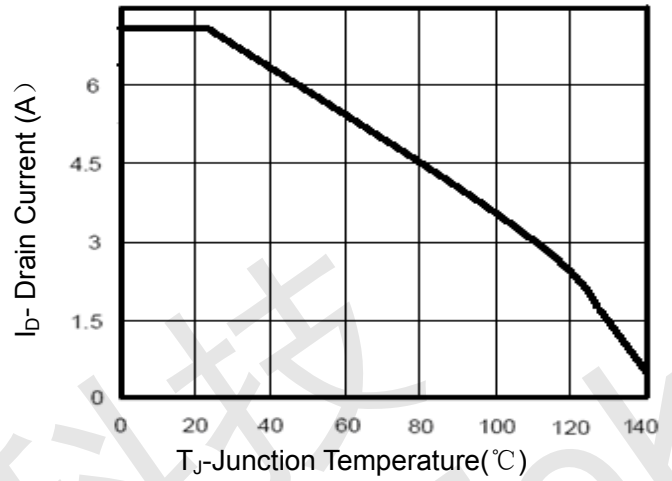


Figure 2 Drain Current

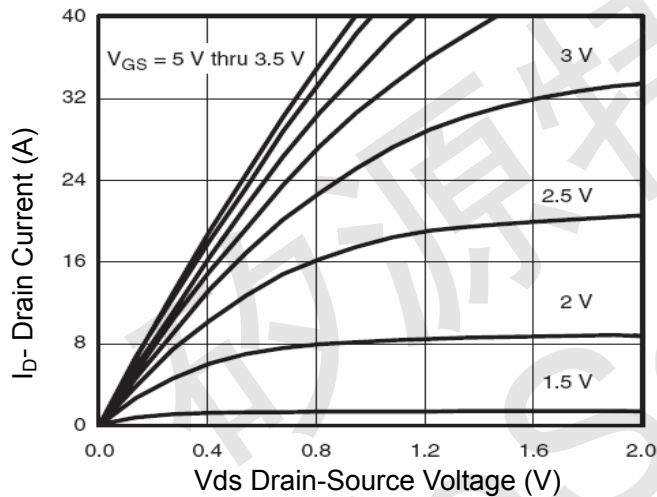


Figure 3 Output Characteristics

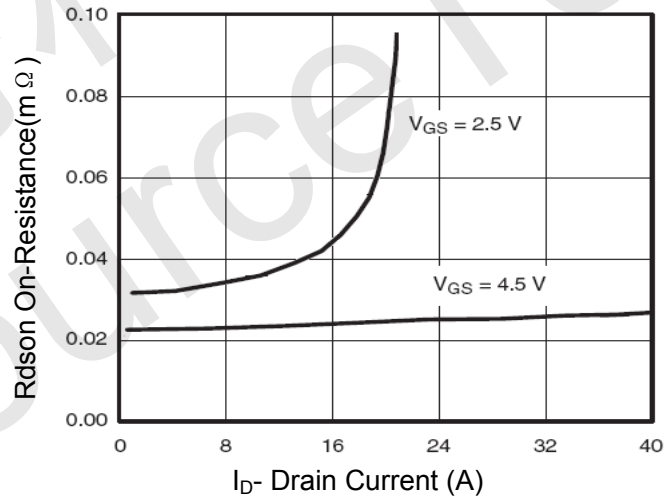


Figure 4 Drain-Source On-Resistance

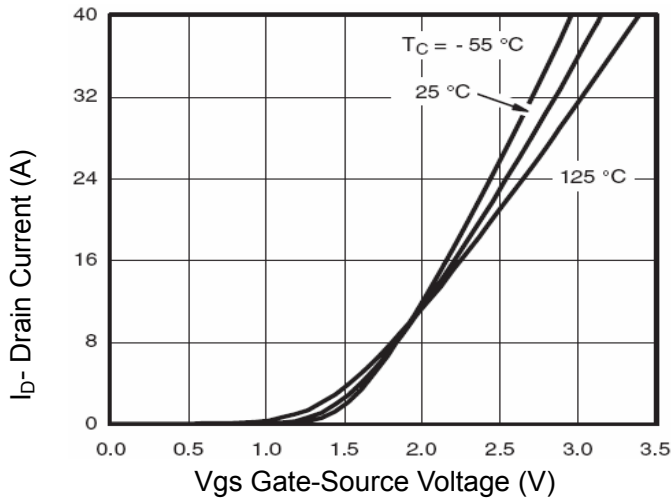


Figure 5 Transfer Characteristics

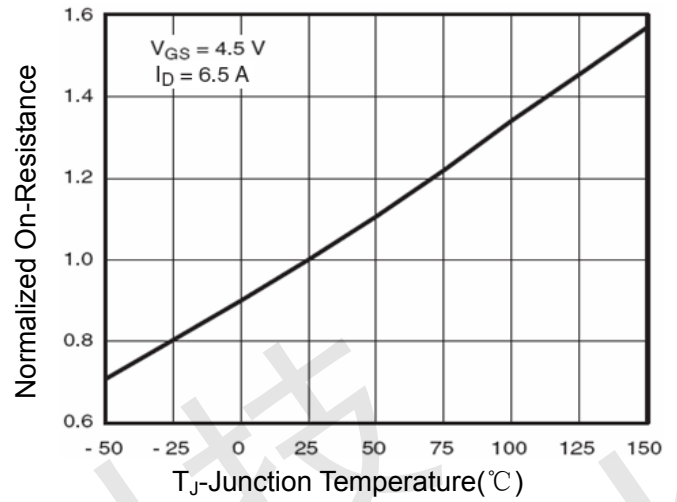


Figure 6 Drain-Source On-Resistance

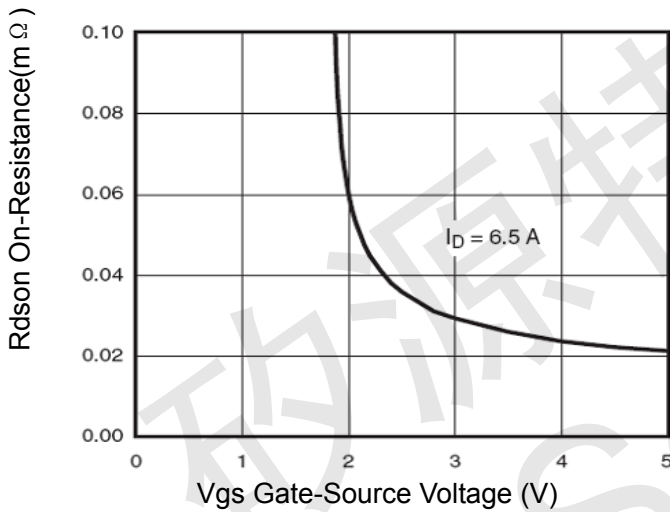


Figure 7  $R_{DS(on)}$  vs  $V_{GS}$

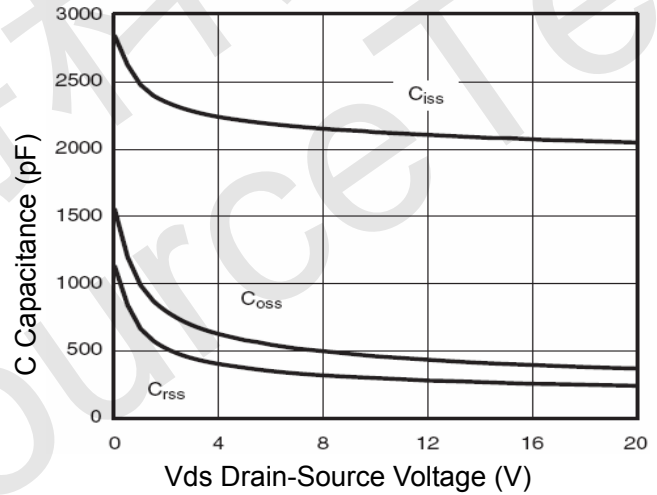


Figure 8 Capacitance vs  $V_{DS}$

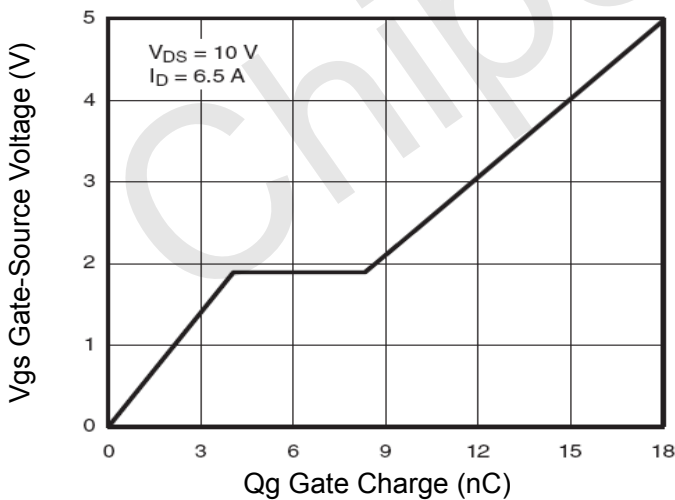


Figure 9 Gate Charge

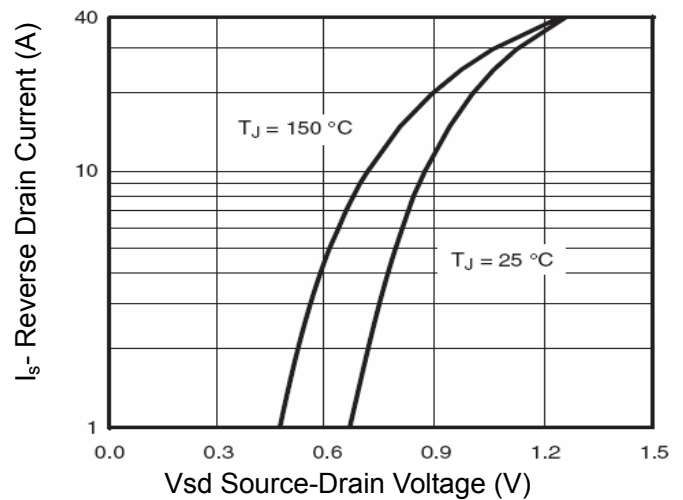
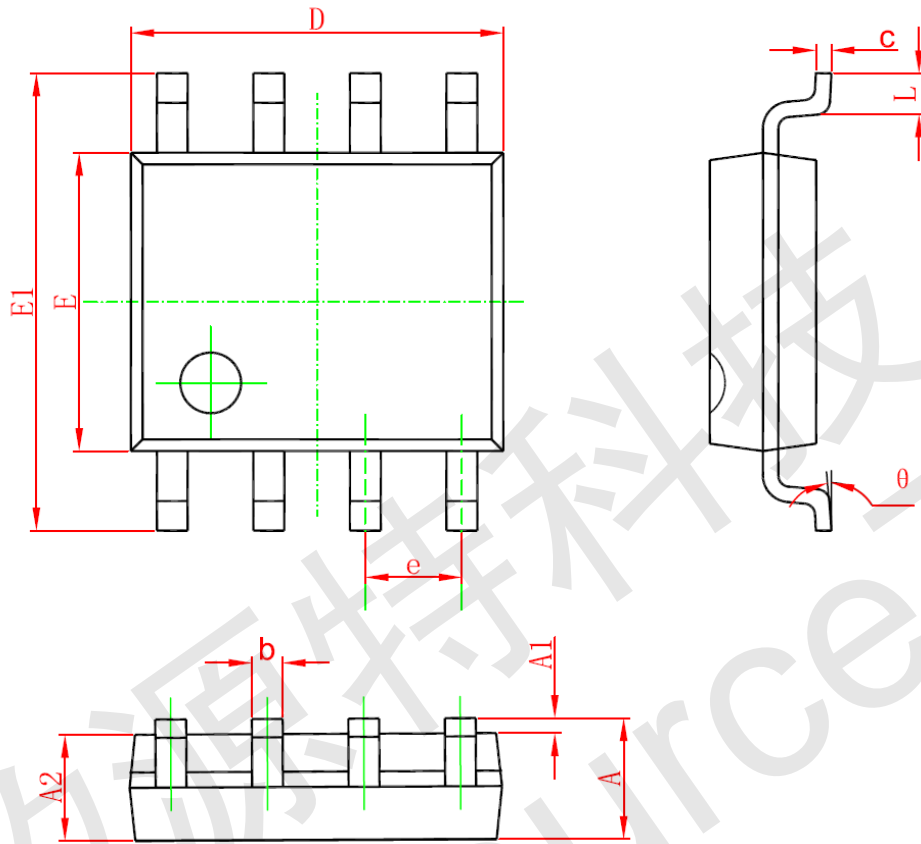


Figure 10 Source-Drain Diode Forward



## SOP-8 PACKAGE IN FORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°