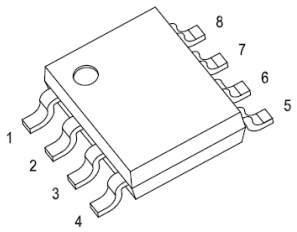
GP4606Q

30V N- and P-Channel MOSFET

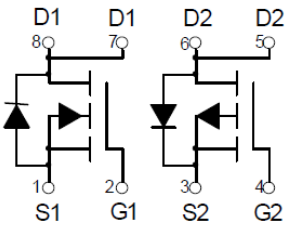
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	29mΩ@-10V	-7A
	41mΩ@-4.5V	
30V	23mΩ@10V	6.5A
	30mΩ@4.5V	

SOP8



Schematic diagram



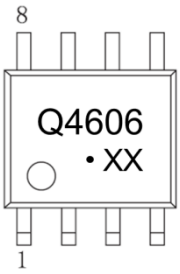
Feature

- Low drain-source on-resistance
- High forward transfer admittance
- Low leakage current

Application

- Low voltage applications

MARKING:



Q4606 = Device Code

XX = Date Code

Solid dot = Green Device

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
P-MOSFET			
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(1)	I_D	-7.0	A
Pulsed Drain Current	I_{DM}	-16	A
Power Dissipation	P_D	1.4	W
N-MOSFET			
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	6.5	A
Pulsed Drain Current(1)	I_{DM}	19	A
Power Dissipation	P_D	1.4	W
Temperature and Thermal Resistance			
Thermal Resistance from Junction to Ambient(2)	$R_{\theta JA}$	89	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

P-channel MOSFET ELECTRICAL CHARACTERISTICS(T_A=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-24V,V_{GS} = 0V			-1	μA
Gate-body Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.5	-2.5	V
Drain-source On-resistance(3)	$R_{DS(on)}$	V_{GS} =-10V, I_D =-6.0A		29	35	mΩ
		V_{GS} =-4.5V, I_D =-5.0A		41	58	
Forward Tranconductance	g_{FS}	V_{DS} =-5V, I_D =-6.0A	5	13		S
Dynamic Characteristics(4)						
Input Capacitance	C_{iss}	V_{DS}=-15V,V_GS=0V, F=1.0MHz		850		pF
Output Capacitance	C_{oss}			101		
Reverse Transfer Capacitance	C_{rss}			65		
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-4A,V_{GS}=-4.5V		9.5		nC
Gate-source Charge	Q_{gs}			2		
Gate-drain Charge	Q_{gd}			3		
Switching Characteristics(4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V,I_D=-4A V_{GS}=-10V,R_{GEN}=6Ω		7		ns
Turn-on rise Time	t_r			3		
Turn-off Delay Time	$t_{d(off)}$			20		
Turn-off Fall Time	t_f			12		
Source - Drain Diode Characteristics						
Diode Forward Voltage(3)	V_{SD}	I_S=-1.0A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-10A, di/dt=100A/us		35		ns

N-channel MOSFET ELECTRICAL CHARACTERISTICS(T_A=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =24V,V_{GS} =0V			1	μA
Gate-body Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.5	2.5	V
Drain-source On-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =6.9A		23	28	mΩ
		V_{GS} =4.5V, I_D =5.0A		30	42	
Forward Tranconductance	g_{FS}	V_{DS} =5V, I_D =6.9A	10	43		S
Dynamic Characteristics(4)						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz		633		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			55		
Total Gate Charge	Q_g	V_{DS}=15V,I_D=5.8A,V_{GS}=4.5V		9.5		nC
Gate-source Charge	Q_{gs}			1.5		
Gate-drain Charge	Q_{gd}			3		
Switching Characteristics(4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=2.7Ω V_{GS}=10V,R_{GEN}=3Ω		3.3		ns
Turn-on Rise Time	t_r			4.8		
Turn-off Delay Time	$t_{d(off)}$			26		
Turn-off Fall Time	t_f			4		
Source - Drain Diode Characteristics						
Diode Forward Voltage(3)	V_{SD}	I_S=1.0A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F=4A, di/dt=100A/us		17		ns

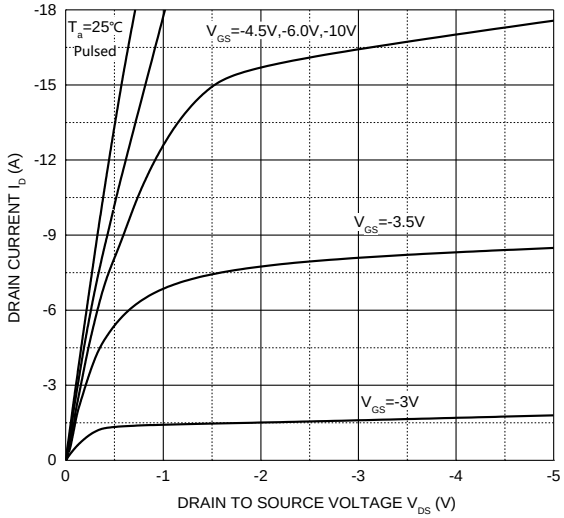
Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

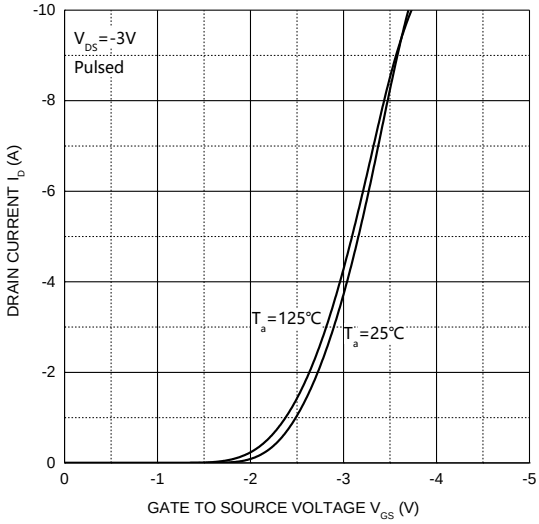
Typical Electrical and Thermal Characteristics

P-Channel MOS

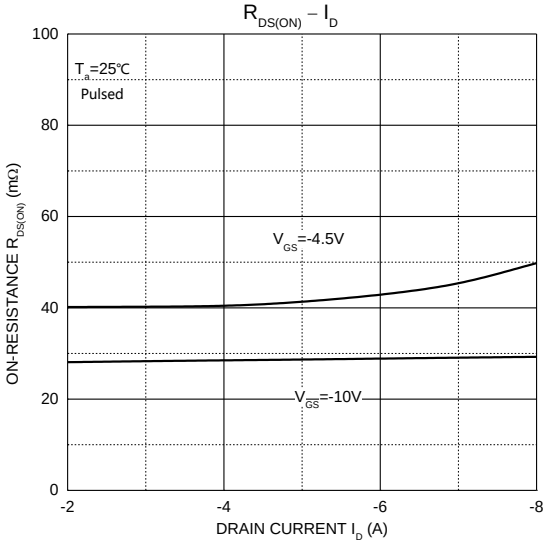
Output Characteristics



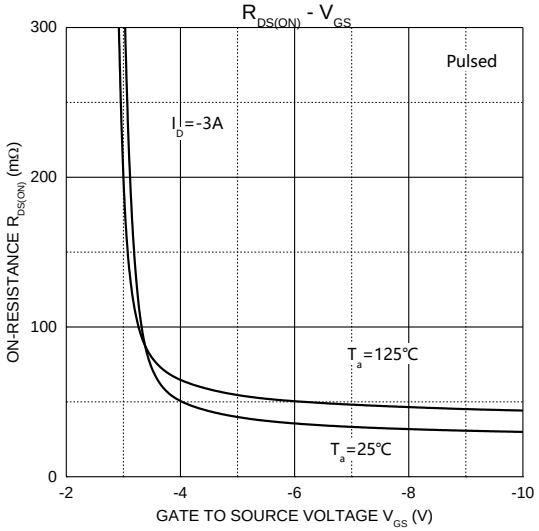
Transfer Characteristics



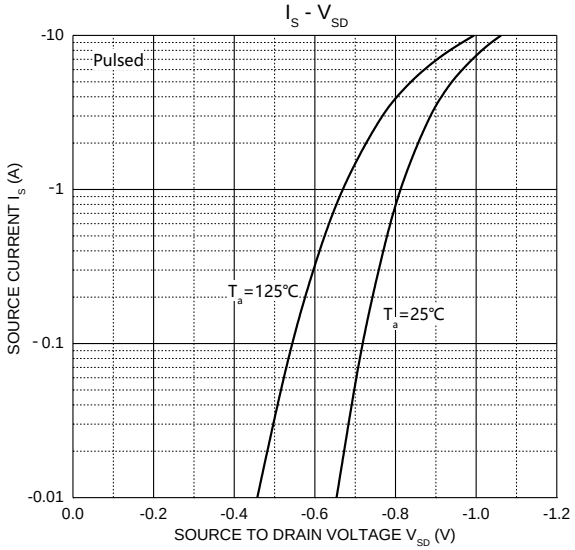
$R_{DS(ON)}$ – I_D



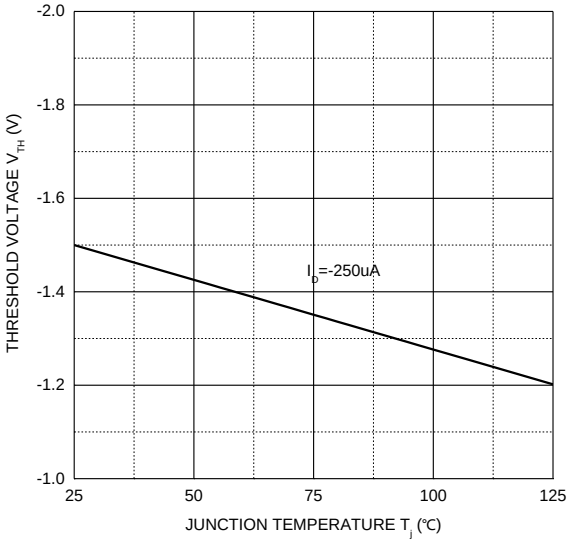
$R_{DS(ON)}$ - V_{GS}

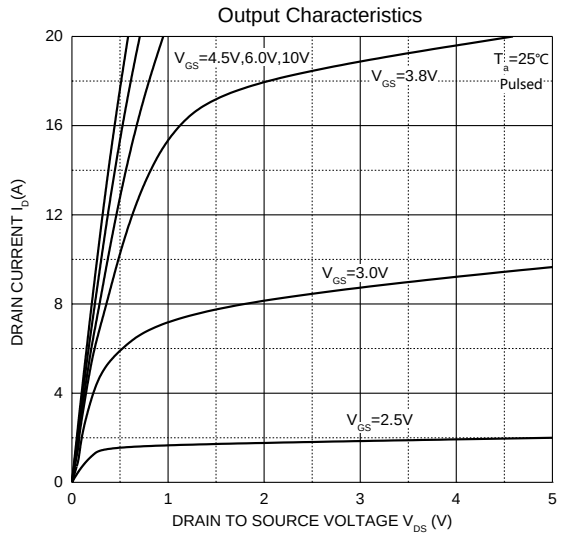


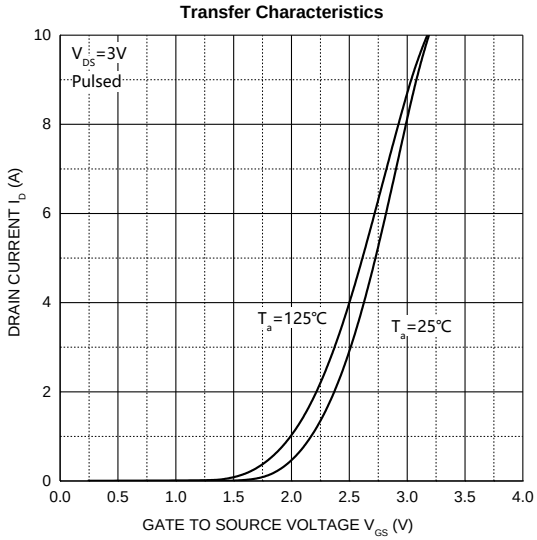
I_S - V_{SD}

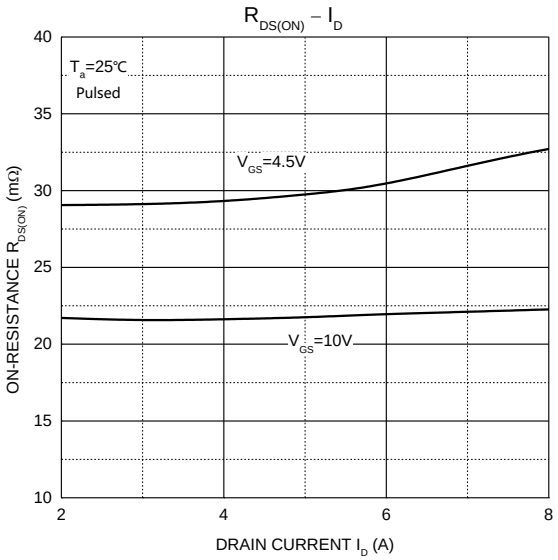


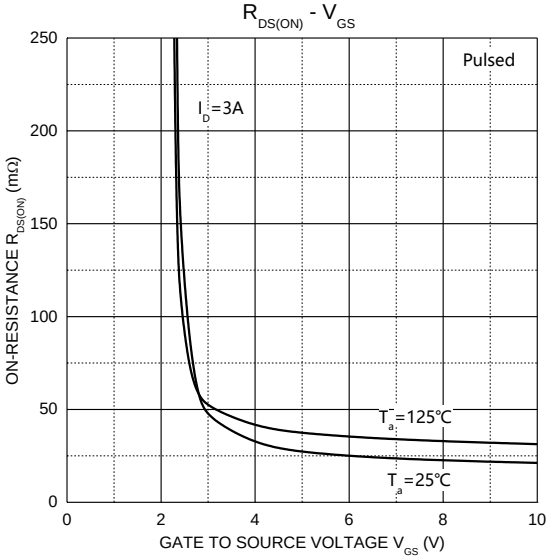
Threshold Voltage

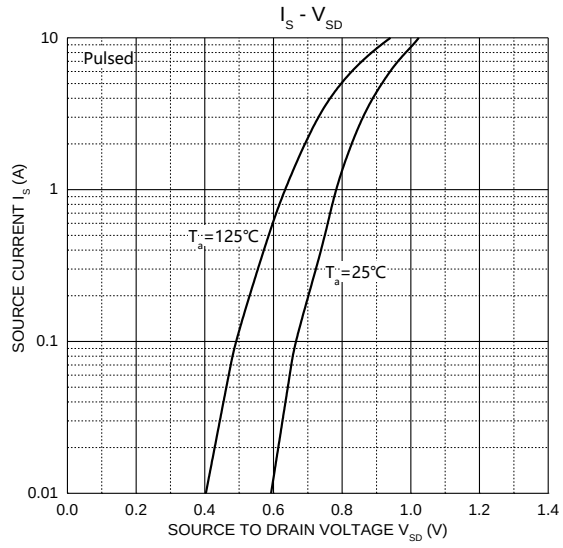


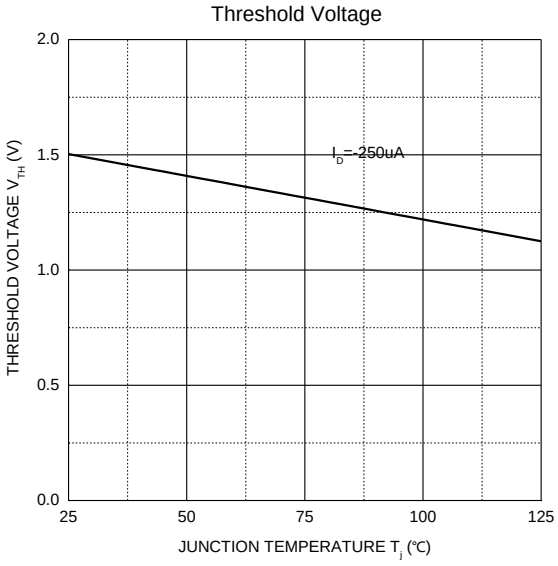

Output Characteristics
V_{GS}=4.5V,6.0V,10V
V_{GS}=3.8V
T_a=25℃
Pulsed
V_{GS}=3.0V
V_{GS}=2.5V
DRAIN CURRENT I_D(A)
DRAIN TO SOURCE VOLTAGE V_{DS} (V)


Transfer Characteristics
V_{DS}=3V
Pulsed
T_a=125℃
T_a=25℃
DRAIN CURRENT I_D (A)
GATE TO SOURCE VOLTAGE V_{GS} (V)

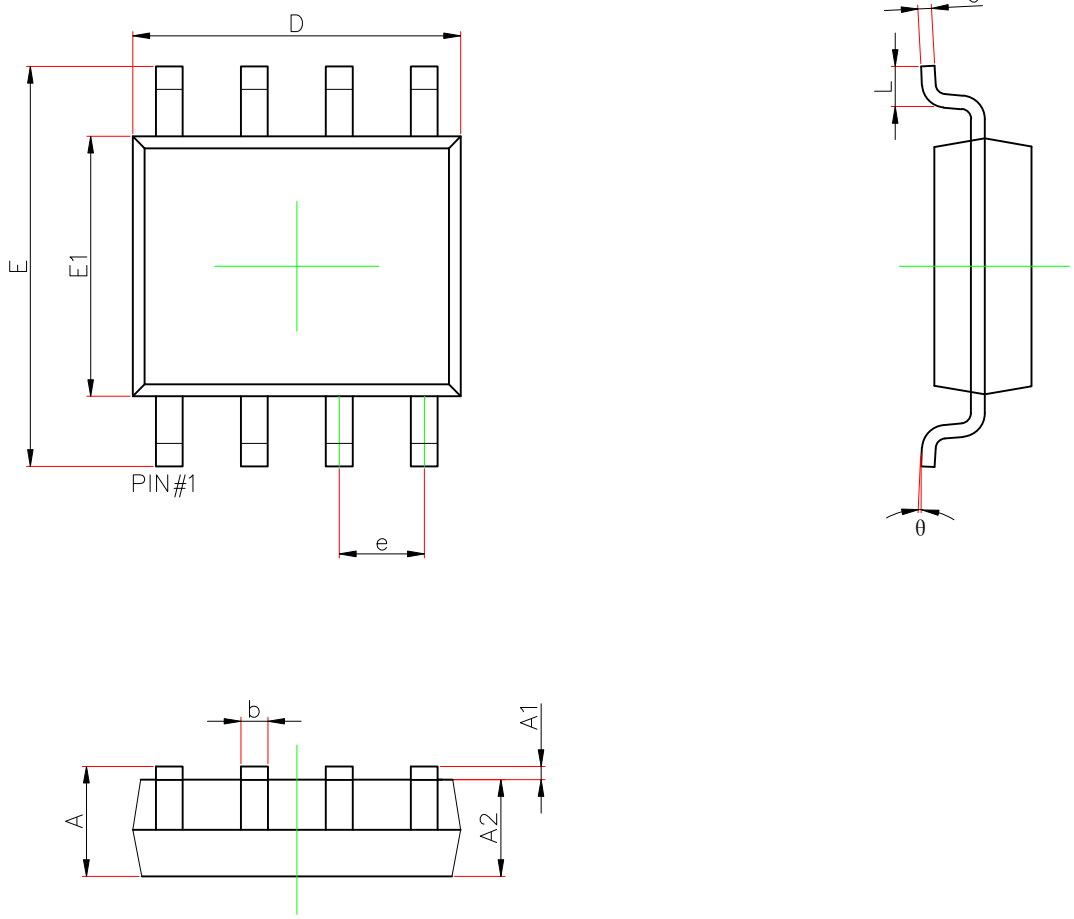

$R_{DS(ON)}$ – I_D
T_a=25℃
Pulsed
V_{GS}=4.5V
V_{GS}=10V
ON-RESISTANCE $R_{DS(ON)}$ (mΩ)
DRAIN CURRENT I_D (A)


$R_{DS(ON)}$ - V_{GS}
Pulsed
I_D=3A
T_a=125℃
T_a=25℃
ON-RESISTANCE $R_{DS(ON)}$ (mΩ)
GATE TO SOURCE VOLTAGE V_{GS} (V)


I_S - V_{SD}
Pulsed
T_a=125℃
T_a=25℃
SOURCE CURRENT I_S (A)
SOURCE TO DRAIN VOLTAGE V_{SD} (V)


Threshold Voltage
I_D=-250uA
THRESHOLD VOLTAGE V_{TH} (V)
JUNCTION TEMPERATURE T_j (℃)

SOP8 Package Information



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	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°