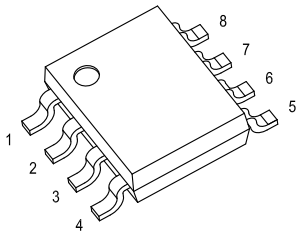
GP09N06Q

60V N-Channel MOSFET

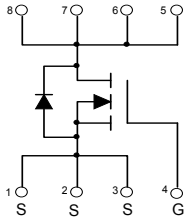
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	8.7mΩ@10V	9A
	11.5mΩ@4.5V	

SOP8



Schematic diagram



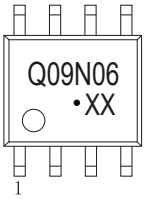
Feature

- High density cell design for ultra low $R_{DS(ON)}$
- Excellent package for good heat dissipation

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

MARKING:



Q09N06 = Device Code

YY = Date Code

Front side

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1,2]		I_D	9	A
Pulsed Drain Current		I_{DM}	36	A
Single Pulsed Avalanche Energy		E_{AS}*	16	mJ
Power Dissipation		P_D	3.1	W
Thermal Resistance from Junction to Ambient[1]	t ≤ 10sec.	$R_{\theta JA}$	40	℃/W
	Steady-State		65	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

*E_{AS} Test Condition V_{DD} = 15V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 18A

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

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	V
Drainsource onresistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 9A		8.7	16	mΩ
		V_{GS} = 4.5V, I_D = 9A		11.5	18	
Forward transconductance	g_{FS}	V_{DS} = 5V, I_D = 9A	10	20		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		2595		pF
Output Capacitance	C_{oss}			177		
Reverse Transfer Capacitance	C_{rss}			163		
Gate resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 30V, V_{GS} = 10V, I_D = 8A		62		nC
GateSource Charge	Q_{gs}			10		
GateDrain Charge	Q_{gd}			21		
Turnon delay time	$t_{d(on)}$	V_{DD} = 30V, R_G = 3Ω,V_{GS} = 10V, R_L = 3Ω		9.5		ns
Turnon rise time	t_r			7		
Turnoff delay time	$t_{d(off)}$			35		
Turnoff fall time	t_f			6		
Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = 9A			1.2	V

Notes :

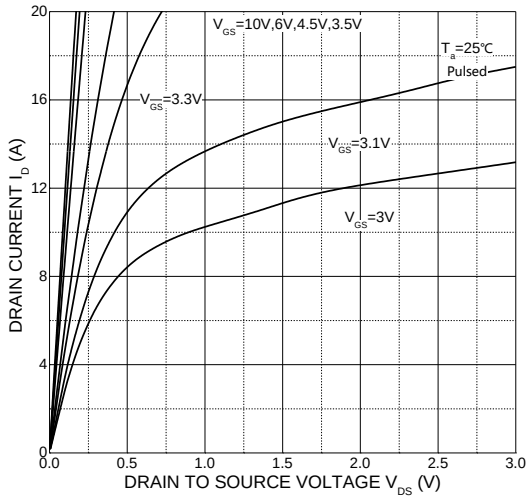
1.$R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR4 board with 1oz. single side copper, in a still air environment with T_A = 25°C.

2.$R_{\theta JA}$ is measured in the steady state

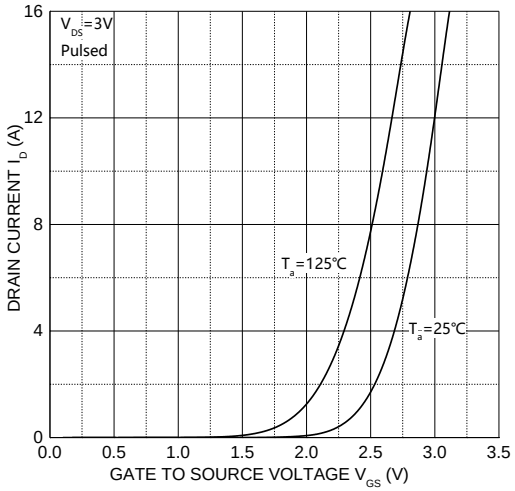
3.Pulse test : Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Characteristics

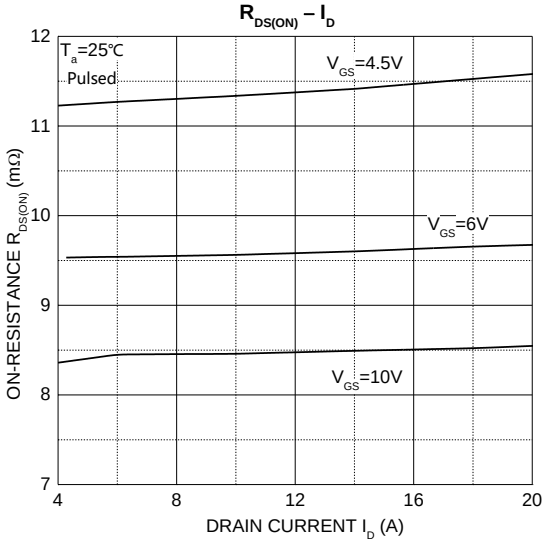
Output Characteristics



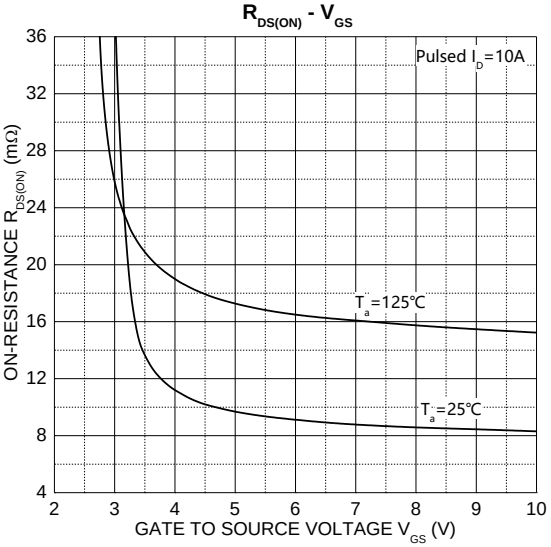
Transfer Characteristics



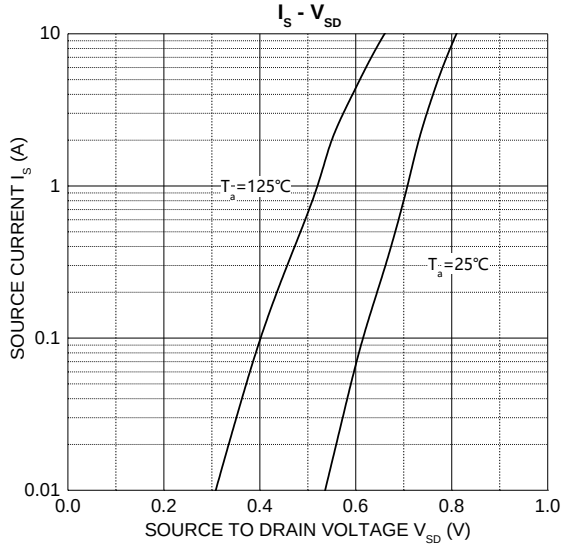
$R_{DS(ON)}$ – I_D



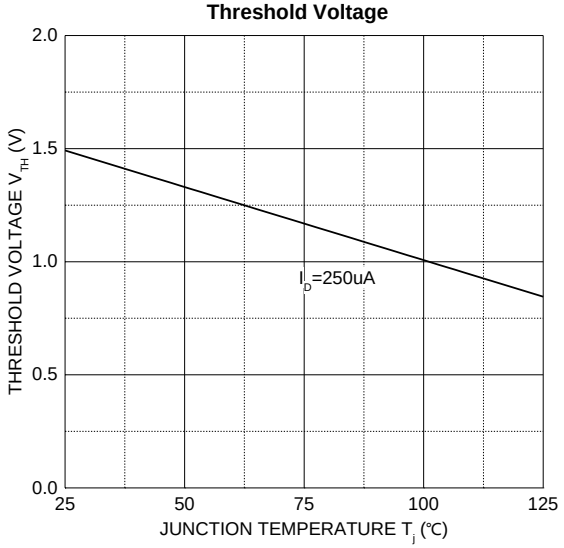
$R_{DS(ON)}$ - V_{GS}



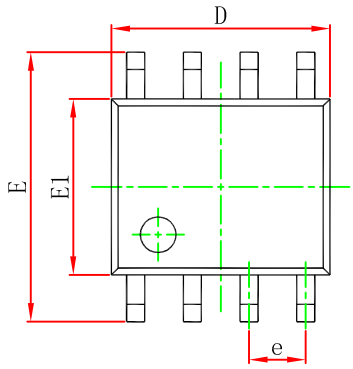
I_S - V_{SD}

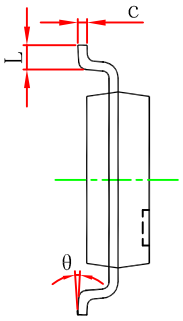


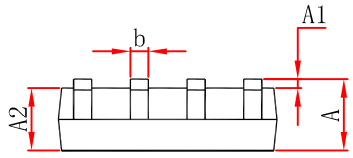
Threshold Voltage



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	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°