

SOP8 Plastic-Encapsulate MOSFETS

P-Channel Power MOSFET

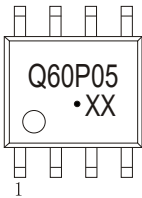
Description

The EPQ60P05 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Feature

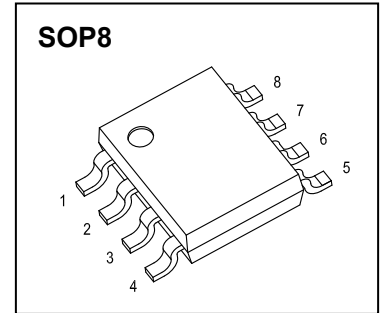
- $V_{DS} = -60V, I_D = -5A$
 $R_{DS(ON)} < 80m\Omega @ V_{GS} = -10V$
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

MARKING



Q60P05 = Device code .
Solid dot = Green molding compound device, if none, the normal device.
XX = Code.

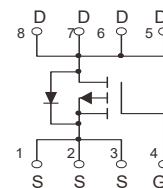
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-60V	61m Ω @-10V	-5A



Application

- Power switching application
- Hard switched and high frequency circuits
- DC-DC Converter
- AEC-Q101 qualified (Automotive grade with suffix "Q".)

Equivalent Circuit



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D ^①	-5	A
Pulsed Drain Current	I_{DM} ^②	-25	A
Maximum Power Dissipation	P_D ^⑤	2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ^⑤	62.5	$^\circ C/W$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$

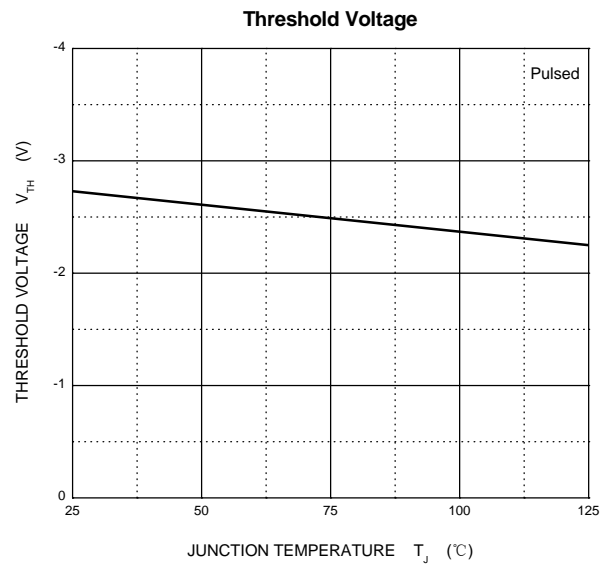
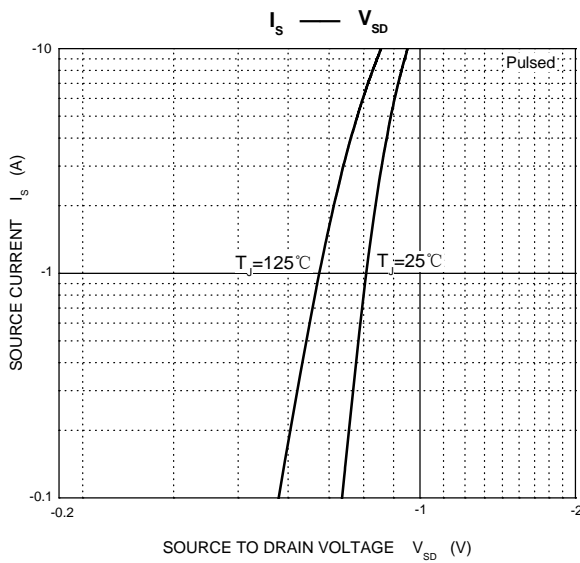
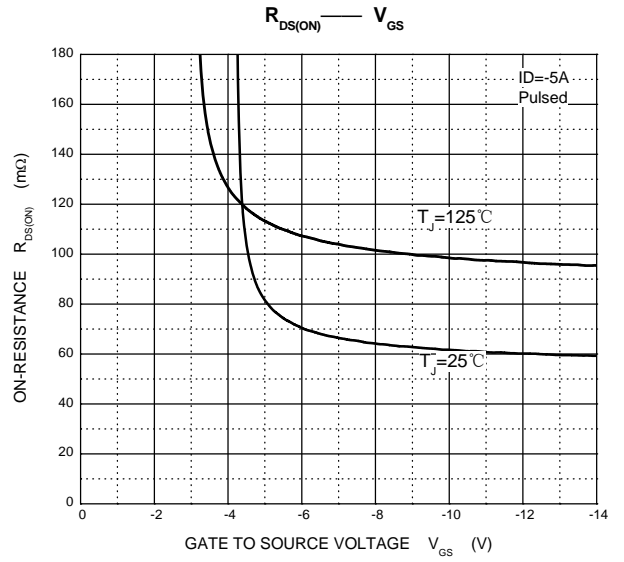
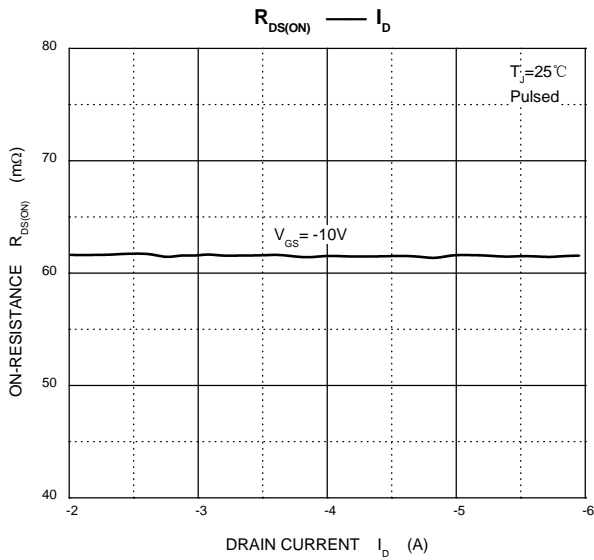
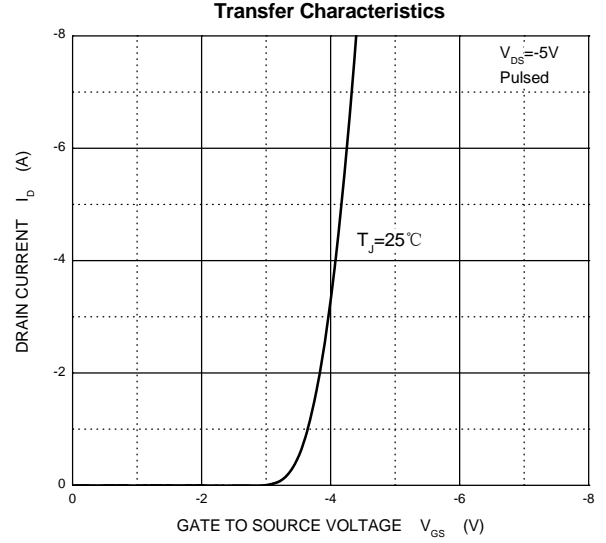
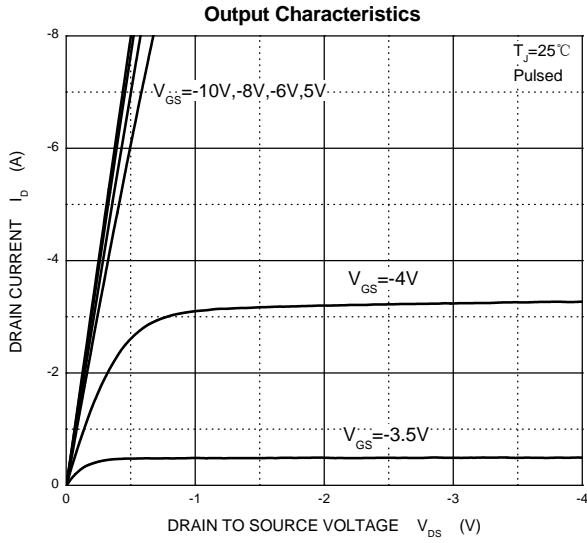
MOSFET ELECTRICAL CHARACTERISTICS $T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -48V, V_{GS} = 0V$	$T_J = 25\text{ }^\circ\text{C}$		-1.0	μA
			$T_J = 125\text{ }^\circ\text{C}$		-100	
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics ^③						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.5	-2.0	-3.5	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5A$		61	80	m Ω
Forward transconductance	g_{FS}	$V_{DS} = -15V, I_D = -5A$	5			S
Dynamic characteristics ^{③④}						
Input capacitance	C_{iss}	$V_{DS} = -30V, V_{GS} = 0V, f = 1MHz$		2563		pF
Output capacitance	C_{oss}			124		
Reverse transfer capacitance	C_{rss}			117		
Gate resistance	R_g	$f = 1MHz$		13		Ω
Switching characteristics ^{③④}						
Total gate charge	Q_g	$V_{DS} = -30V, V_{GS} = -10V, I_D = -5A$		26	52	nC
Gate-source charge	Q_{gs}			4.5	9	
Gate-drain charge	Q_{gd}			7	14	
Turn-on delay time	$t_{d(on)}$	$V_{DS} = -30V, V_{GS} = -10V, R_L = 30\Omega, R_G = 6\Omega$		8		ns
Turn-on rise time	t_r			9		
Turn-off delay time	$t_{d(off)}$			65		
Turn-off fall time	t_f			30		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ^③	$V_{GS} = 0V, I_S = -3A$			-1.2	V
Continuous drain-source diode forward current	I_S ^①				-5	A
Pulsed drain-source diode forward current	I_{SM} ^②				-25	A

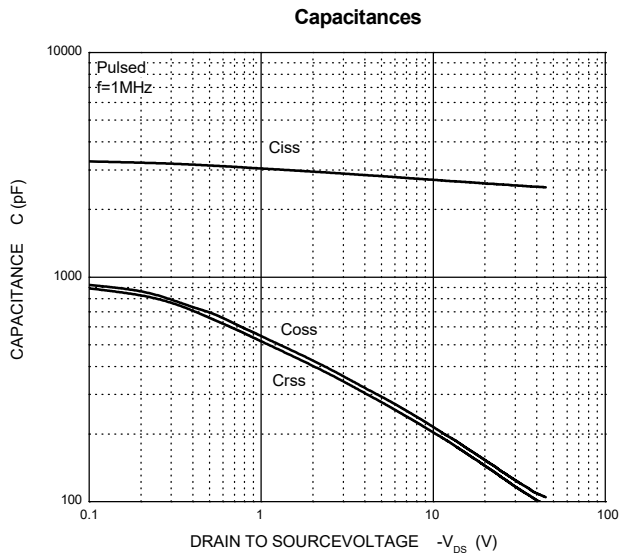
Notes:

- $T_C = 25\text{ }^\circ\text{C}$ Limited only by maximum temperature allowed.
- $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
- Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25\text{ }^\circ\text{C}, t \leq 10\text{sec}$.

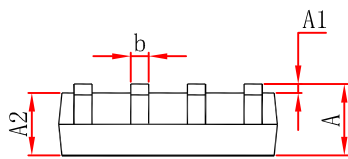
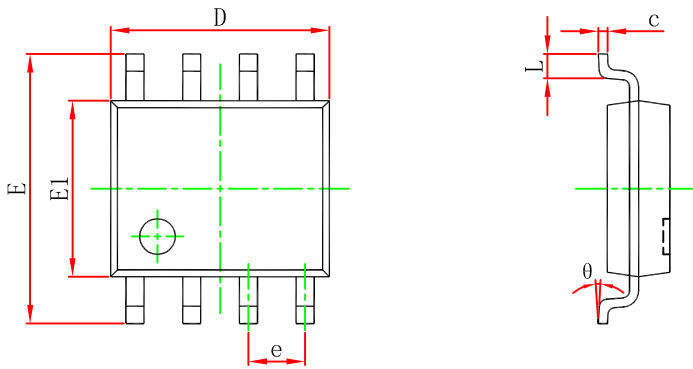
Typical Characteristics



Typical Characteristics

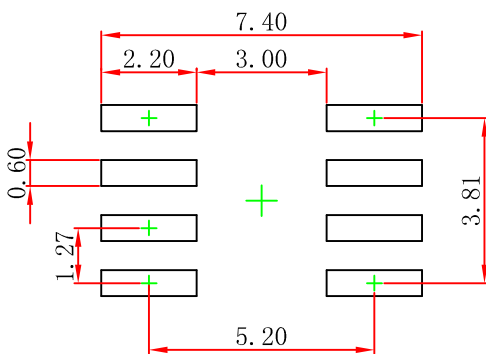


SOP8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	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	4.700	5.100	0.185	0.201
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°

SOP8 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.