

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_b
60V	11m Ω @10V	12A
	14m Ω @4.5V	

Feature

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- Suffix "-Q1" for AEC-Q101

Application

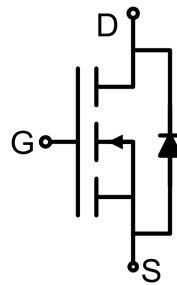
- DC-DC Converters
- Power management functions
- Industrial and Motor Drive application

Package

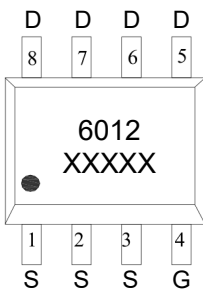


SOP-8

Circuit diagram



Marking



Absolute maximum ratings (Ta=25°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	12	A
Pulsed Drain Current	I_{DM}	48	A
Power Dissipation	P_D	3	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	42	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Electrical characteristics (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static 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}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.9		1.8	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 12A$			11	mΩ
		$V_{GS} = 4.5V, I_D = 6A$			14	
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$		4100		pF
Output Capacitance	C_{oss}			298		
Reverse Transfer Capacitance	C_{rss}			229		
Total Gate Charge	Q_g	$V_{DS} = 30V, V_{GS} = 10V, I_D = 12A$		93		nC
Gate-Source Charge	Q_{gs}			9.7		
Gate-Drain Charge	Q_{gd}			20		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, R_L = 1\Omega, R_{GEN} = 3\Omega$		8.5		nS
Turn-on rise time	t_r			7		
Turn-off delay time	$t_{d(off)}$			40		
Turn-off fall time	t_f			15		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I_S				12	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 12A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ C, I_F = 12A, di/dt = 100A/\mu s$ ¹⁾		32		nS
Reverse Recovery Charge	Q_{rr}			45		nC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

Typical Characteristics

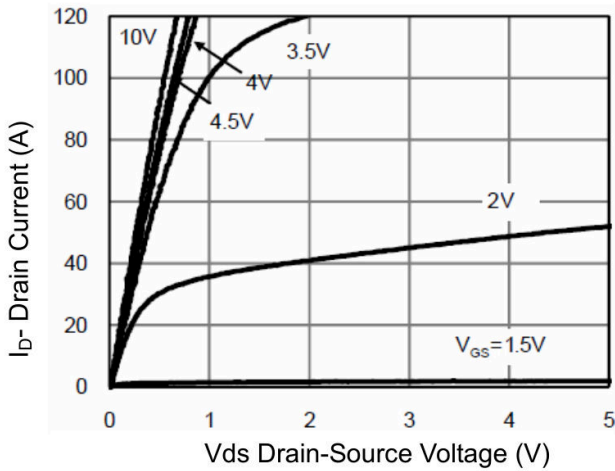


Figure 1 Output Characteristics

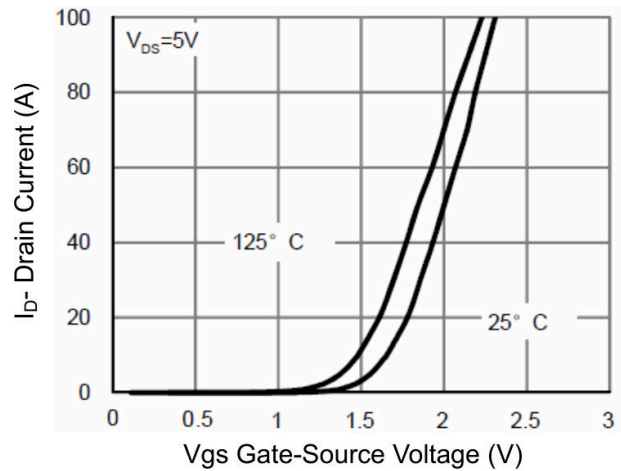


Figure 2 Transfer Characteristics

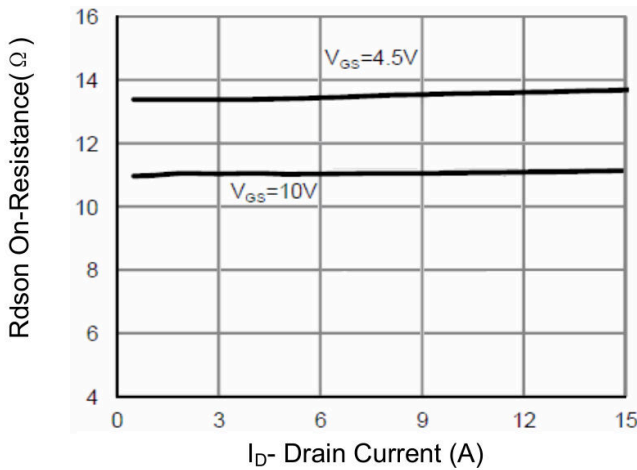


Figure 3 Rdson- Drain Current

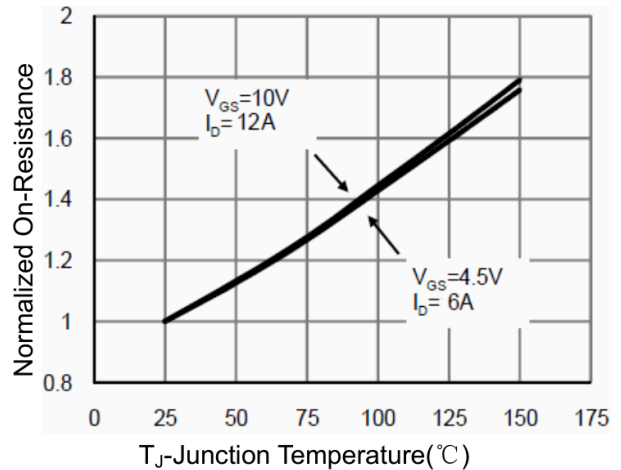


Figure 4 Rdson-Junction Temperature

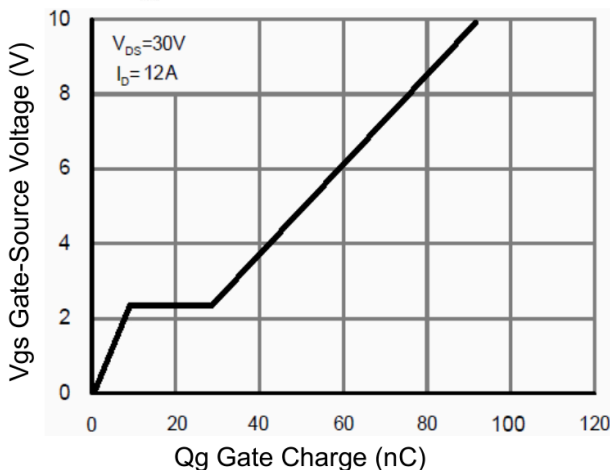


Figure 5 Gate Charge

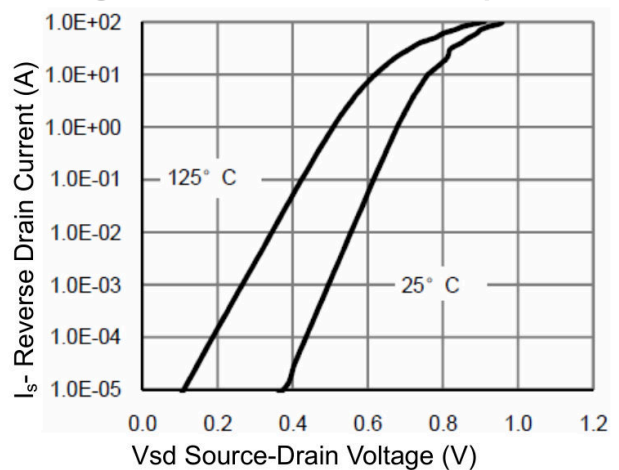


Figure 6 Source- Drain Diode Forward

Typical Characteristics

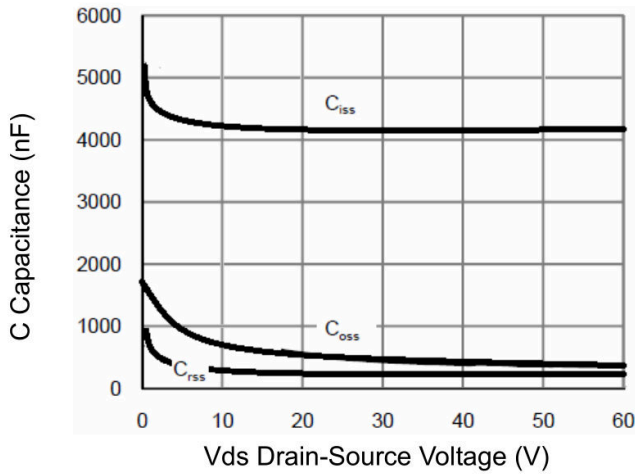


Figure 7 Capacitance vs Vds

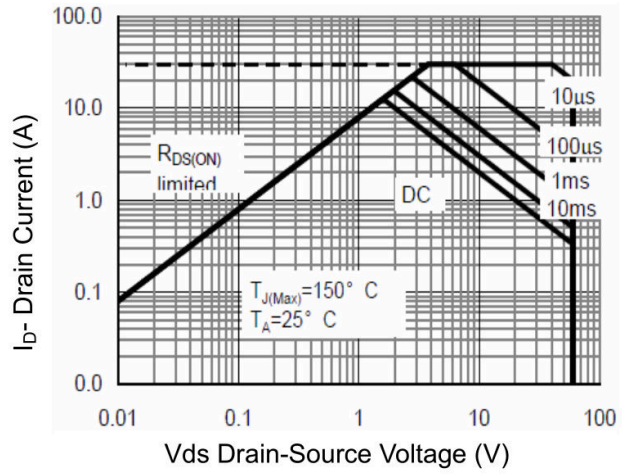


Figure 8 Safe Operation Area

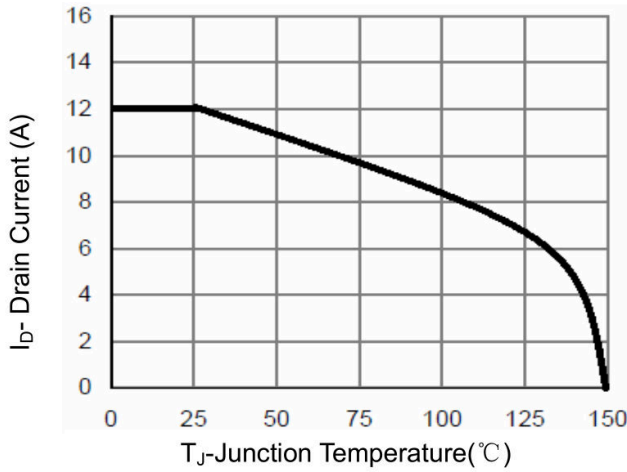


Figure 9 Current De-rating

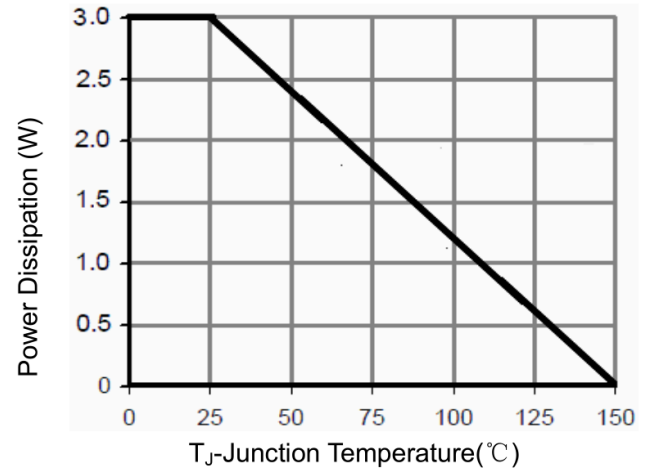


Figure 10 Power De-rating

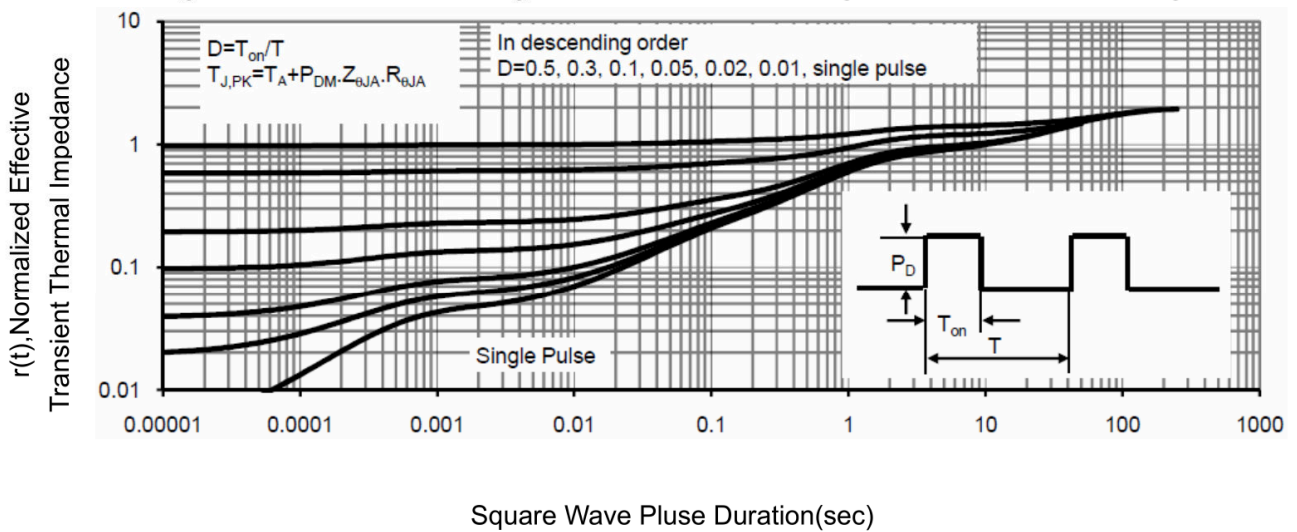
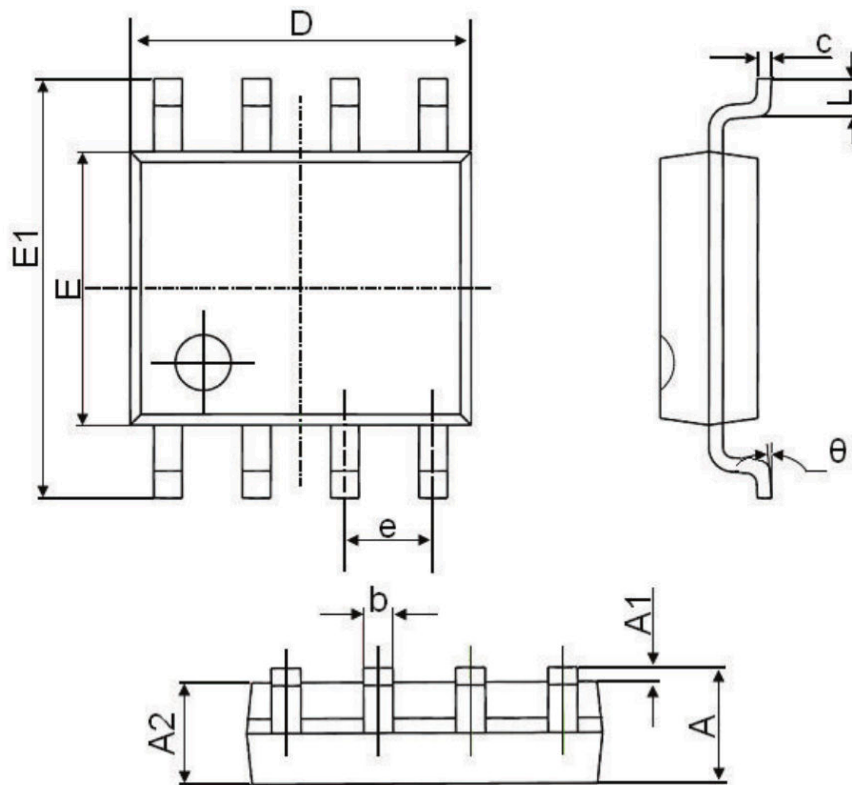


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 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	0.006	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
theta	0°	8°	0°	8°