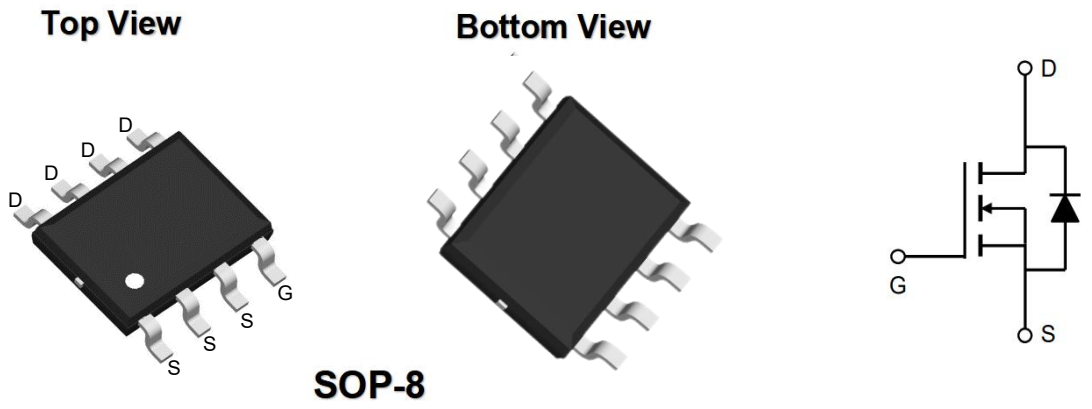
Features

The TW6009 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

Product Summary

V_{DS}	60V
I_D	9A
$R_{DS(ON)}$(at V_{GS} =10V)	<16mΩ
$R_{DS(ON)}$(at V_{GS} =4.5V)	< 18mΩ



Maximum Ratings(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	
Drain Current-Continuous	ID	9	A
Drain Current-Continuous(TC=100℃)	ID (100℃)	6.4	A
Pulsed Drain Current	IDM	36	A
Total Power Dissipation	PD@TA=25℃	2.6	W
Storage Temperature Range	TSTG	-55 to 150	℃
Operating Junction Temperature Range	TJ	-55 to 150	
Thermal Data			
Parameter	**Symbol**	**Max.**	**Unit**
Thermal Resistance Junction-ambient	RθJA	48	℃/W

Electrical Characteristics(TJ=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V, ID = 250μA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	VDS =VGS, ID = 250μA	1.2	1.8	2.2	V
Gate-Body leakage Current	I_{GSS}	VDS =0V, VGS = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 60V, VGS =0V			1	μA
Static Drain-Source On-Resistance	$R_{DS(on)}$	VGS = 10V, ID = 9A		13	16	mΩ
		VGS = 4.5V, ID = 9A		15	18	mΩ
Dynamic Parameters						
Input Capacitance	Ciss	VDS=30V,VGS=0V, F=1.0MHz		2750		pF
Output Capacitance	Coss			170		pF
Reverse Transfer Capacitance	Crss			152		pF
Total Gate Charge	Qg	VDS=30V,ID=8A, VGS=10V		60		nC
Gate Source Charge	Qgs			10		nC
Gate Drain Charge	Qgd			14		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VDD=30V, RL=1Ω VGS=10V,RGEN=3Ω		9		ns
Turn-On Rise Time	tr			7		ns
Turn-Off DelayTime	td(off)			32		ns
Turn-Off Fall Time	tf			6		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage (Note 3)	VSD	VGS=0V,IS=9A			1.2	A
Diode Forward Current (Note 2)	I_S				9	V
Reverse Recovery Time	trr	IF=9A di/dt = 100A/μs(Note3)		30		ns
Reverse Recovery Charge	Qrr			44		nC

Note :

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

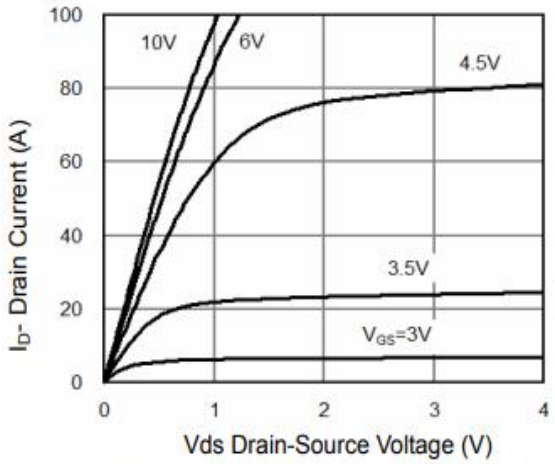


Figure 1 Output Characteristics

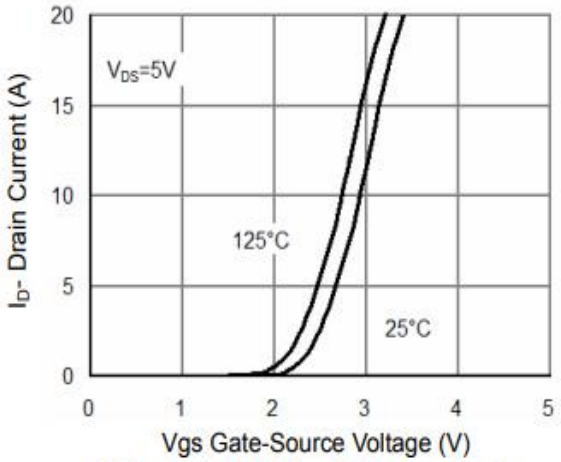


Figure 2 Transfer Characteristics

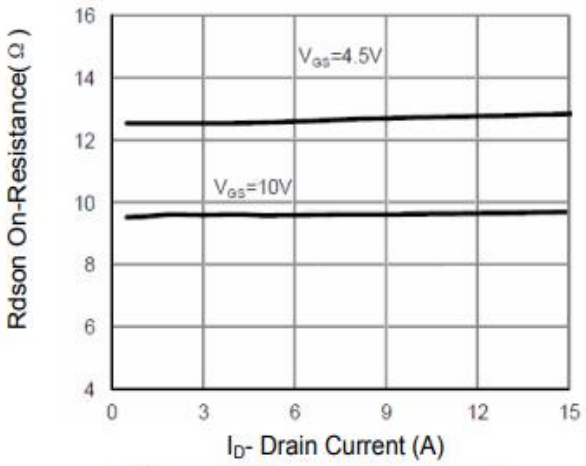


Figure 3 Rdson- Drain Current

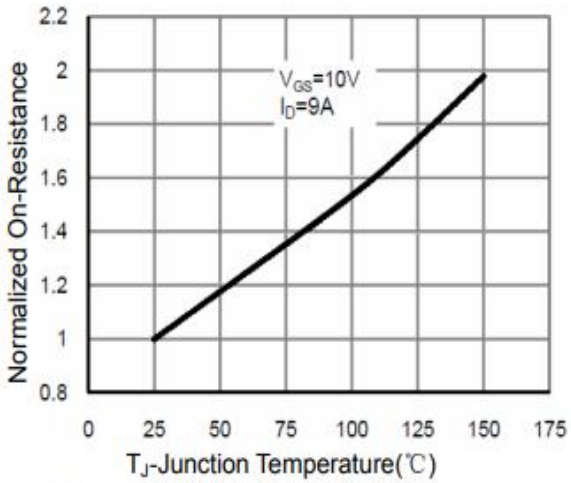


Figure 4 Rdson-JunctionTemperature

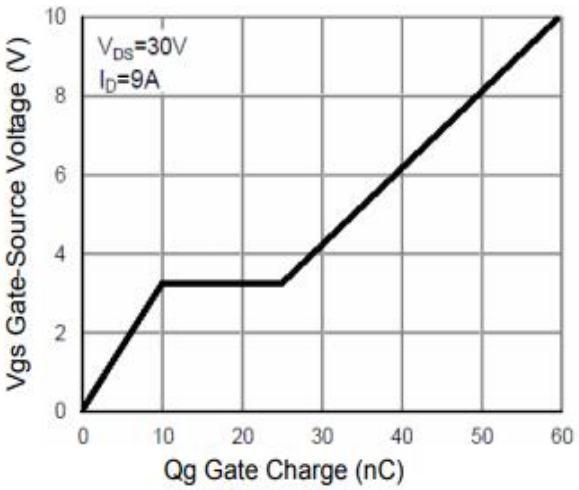


Figure 5 Gate Charge

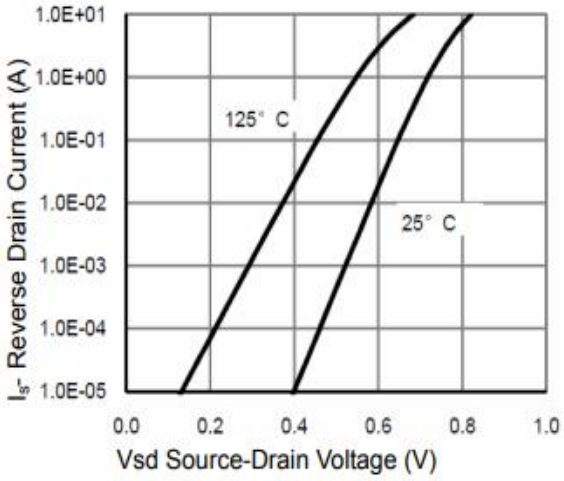


Figure 6 Source- Drain Diode Forward

Typical Electrical and Thermal Characteristics

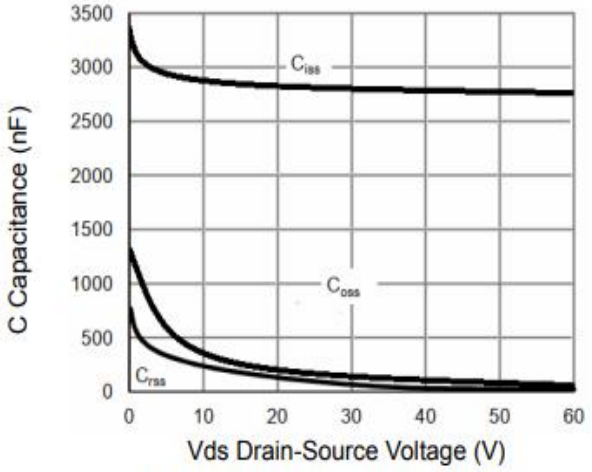


Figure 7 Capacitance vs Vds

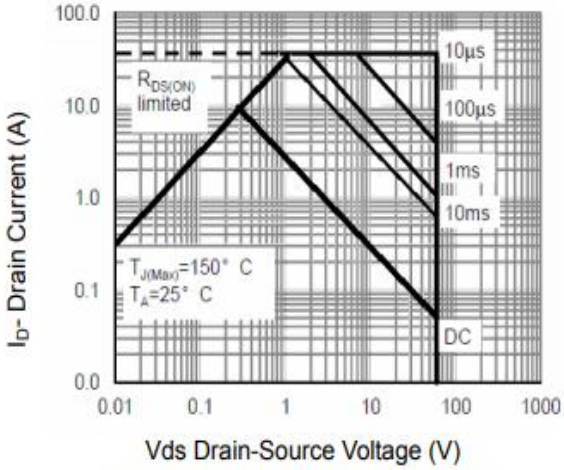


Figure 8 Safe Operation Area

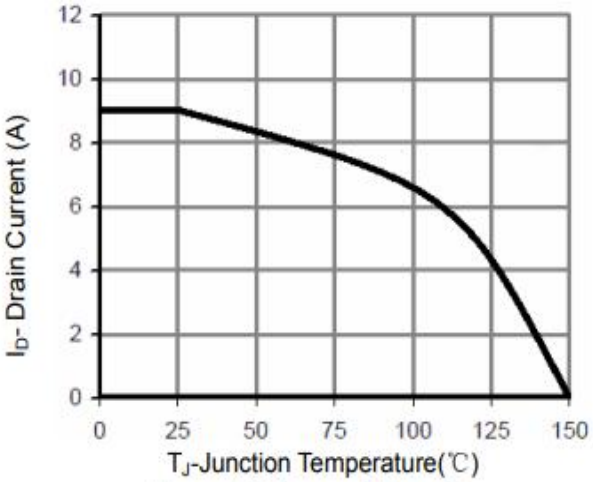


Figure 9 Current De-rating

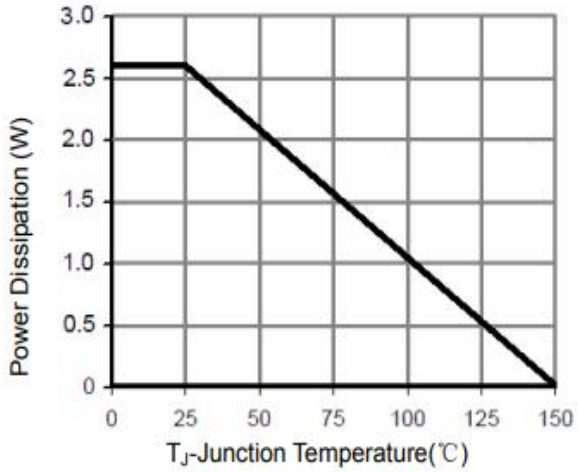


Figure 10 Power De-rating

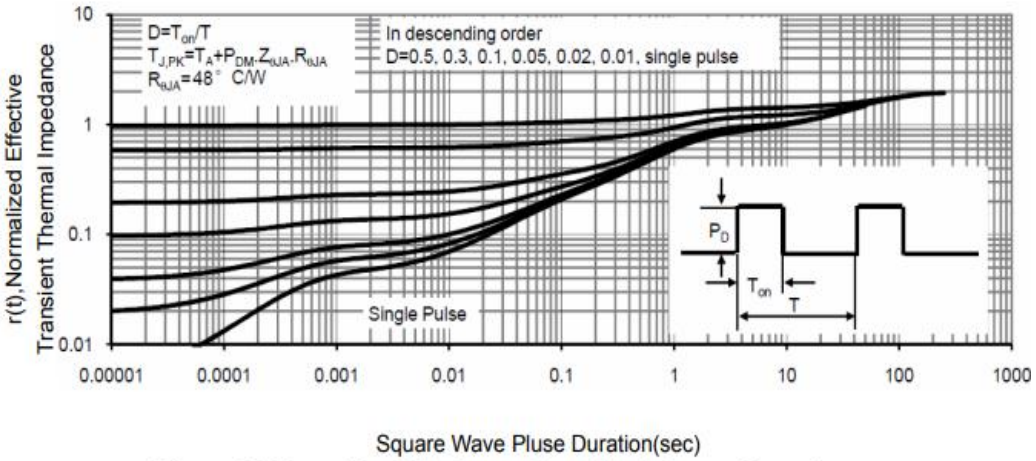
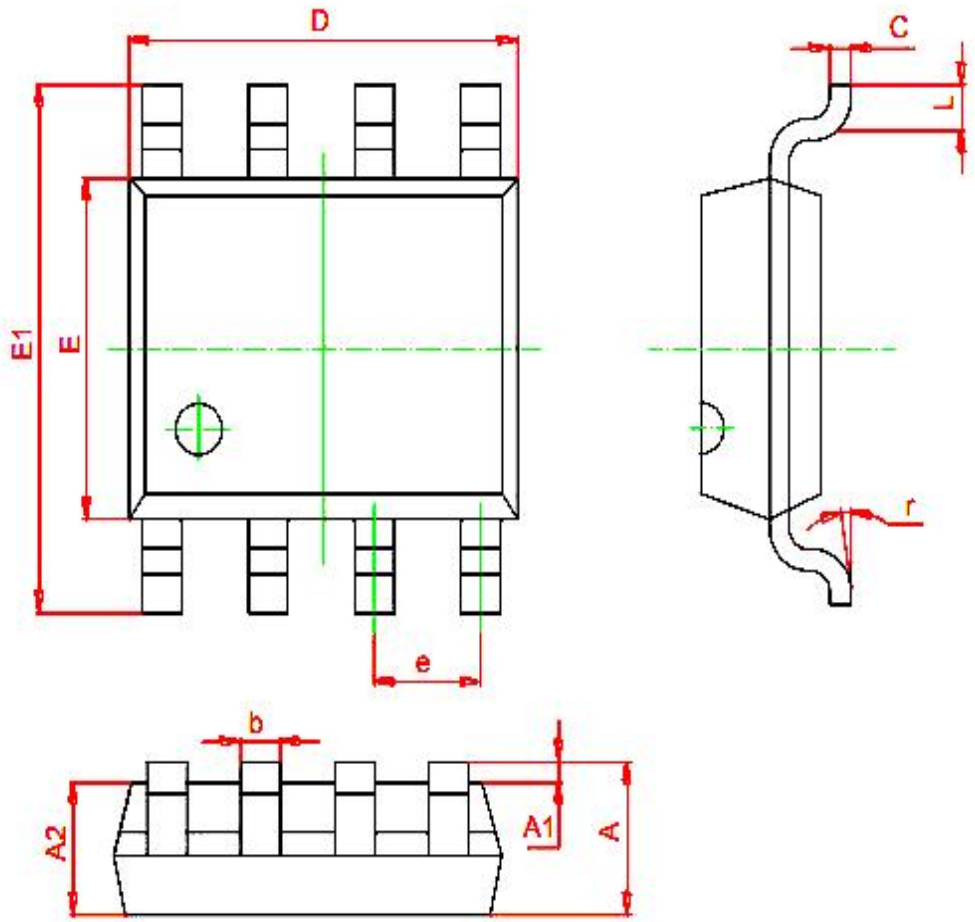


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 Package Outline Dimesions



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°