P-Channel MOSFET

DESCRIPTION

The SL4459 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.
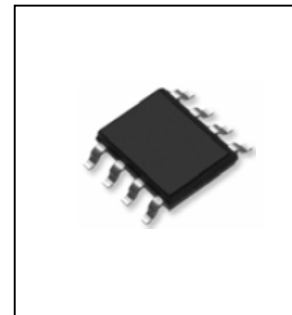
GENERAL FEATURES

- V_{DS} = -30V, I_D = -6.5A

  $R_{DS(ON)}$ < 46mΩ @ V_{GS}=-10V
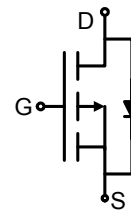
  $R_{DS(ON)}$ < 72mΩ @ V_{GS}=-4.5V

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

SOP-8 top view

pin Assignment   **Schematic diagram**

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-6.5	A
Drain Current-Pulsed (Note 1)	I_{DM}	-22	A
Maximum Power Dissipation	P_D	2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	50	℃/W

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30	-33		V

Parameter	Symbol	Condition	Min	Typ	Max	Unit
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
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250µA	-1		-2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6A			46	mΩ
		V_{GS}=-6V, I_D=-5A			58	mΩ
		V_{GS}=-4.5V, I_D=-5A			72	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-15V,I_D=-6.5A	4	7		S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz		1040		PF
Output Capacitance	C_{oss}			420		PF
Reverse Transfer Capacitance	C_{rss}			150		PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, ID=-1A, V_{GS}=-10V,R_{GEN}=6Ω		15		nS
Turn-on Rise Time	t_r			13		nS
Turn-Off Delay Time	$t_{d(off)}$			58		nS
Turn-Off Fall Time	t_f			21		nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-6.5A,V_{GS}=-10V		12		nC
Gate-Source Charge	Q_{gs}			2.2		nC
Gate-Drain Charge	Q_{gd}			3		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1.7A			-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

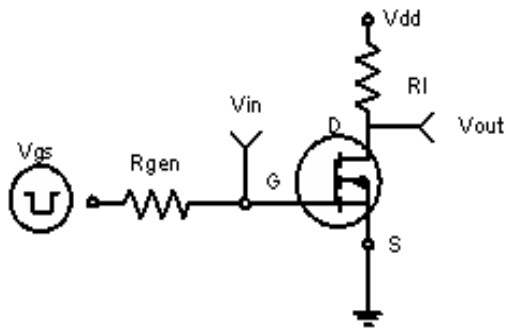## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
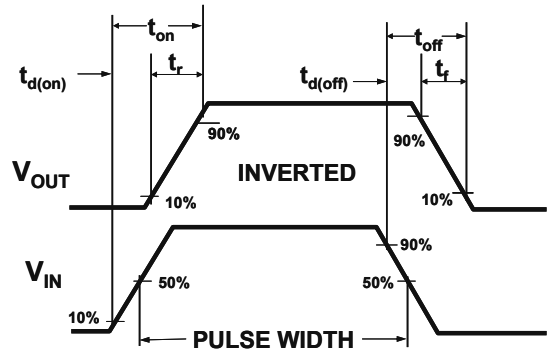

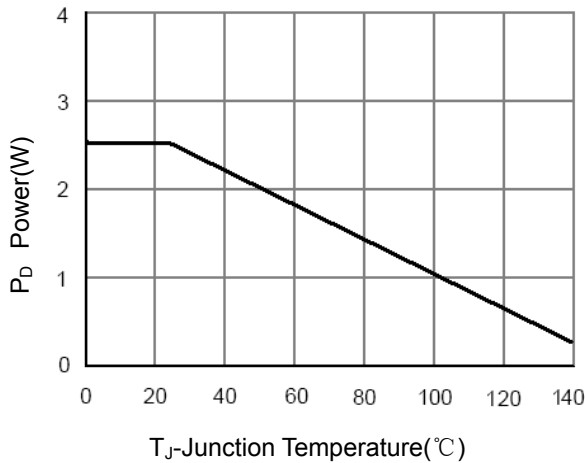**Figure 1:Switching Test Circuit**

Figure 2:Switching Waveforms
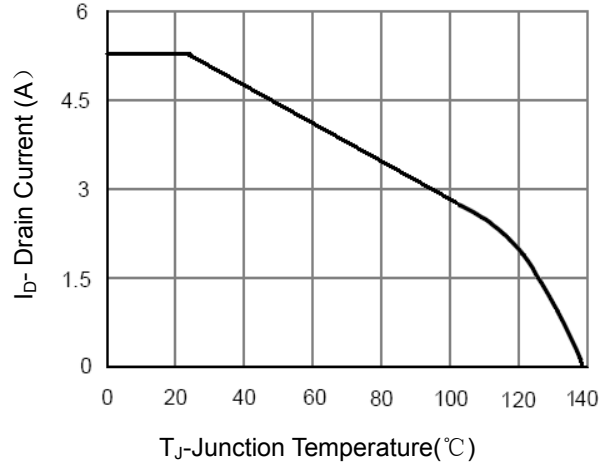

Figure 3 Power Dissipation
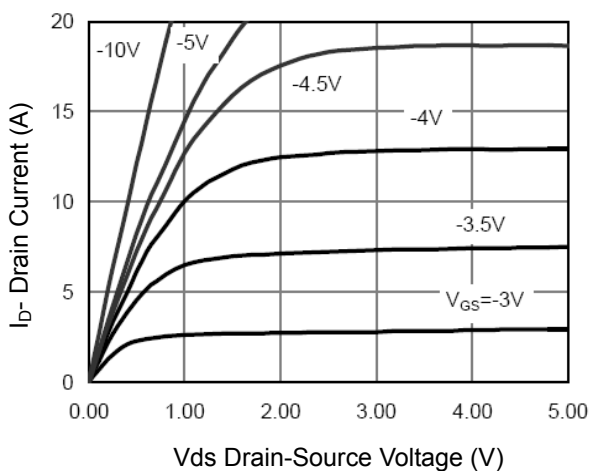

Figure 4 Drain Current
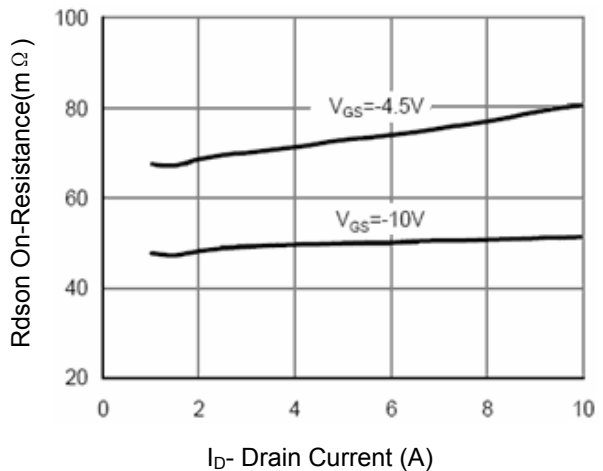

Figure 5 Output CHARACTERISTICS

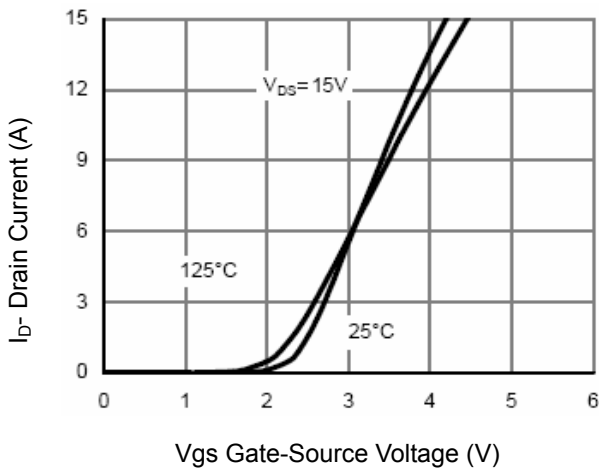**Figure 6 Drain-Source On-Resistance**

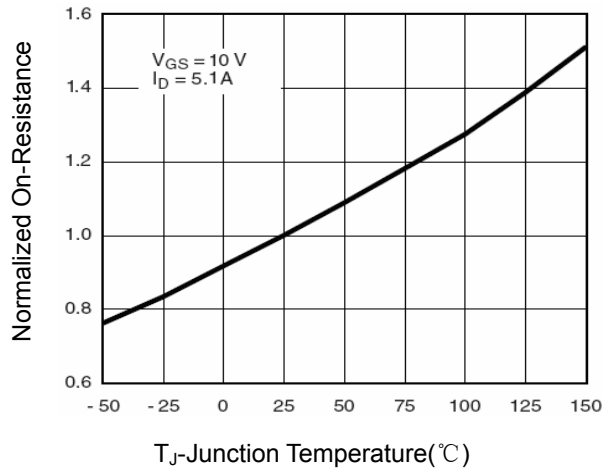**Figure 7 Transfer Characteristics**
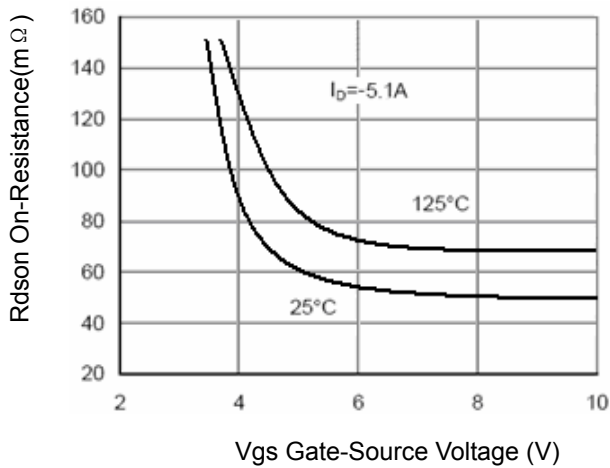

Figure 8 Drain-Source On-Resistance
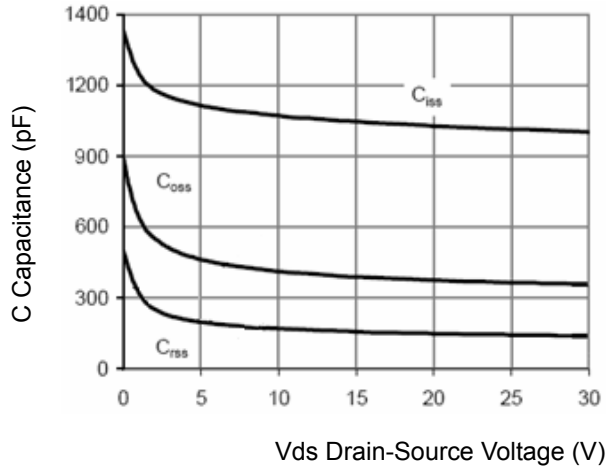

Figure 9 Rdson vs Vgs
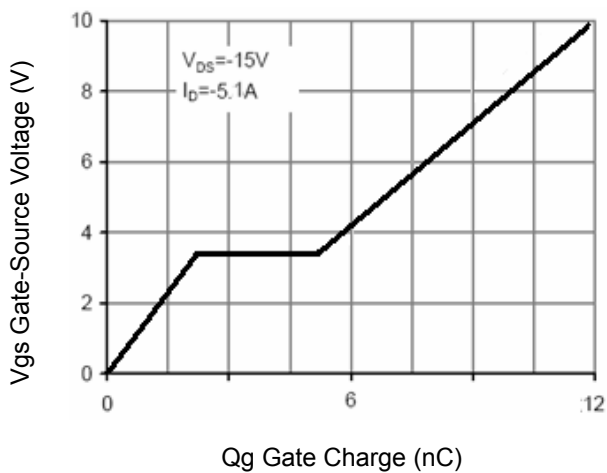

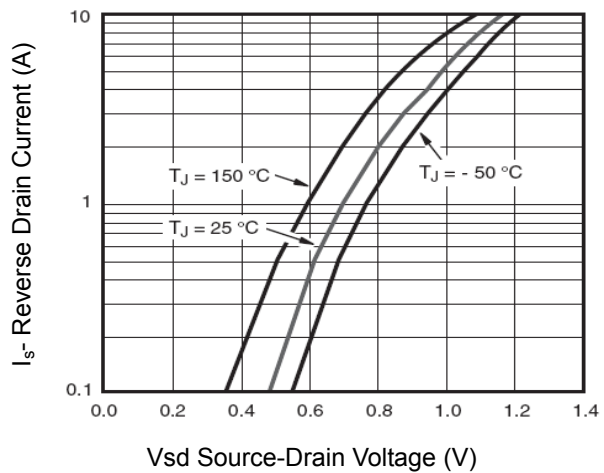**Figure 10 Capacitance vs Vds**
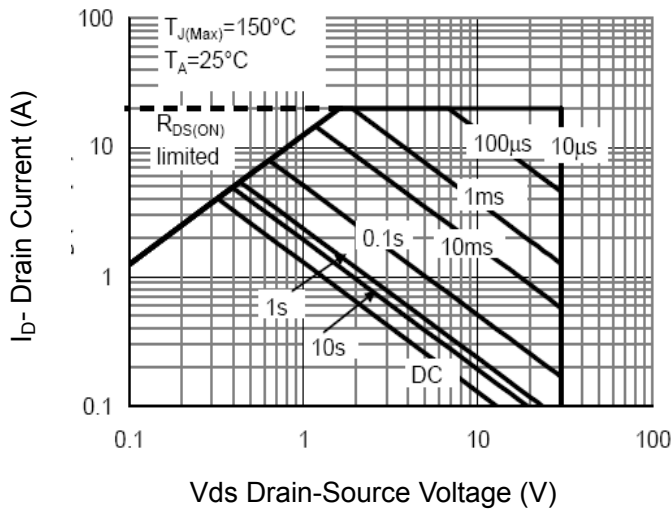

Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

Figure 13   Safe Operation Area
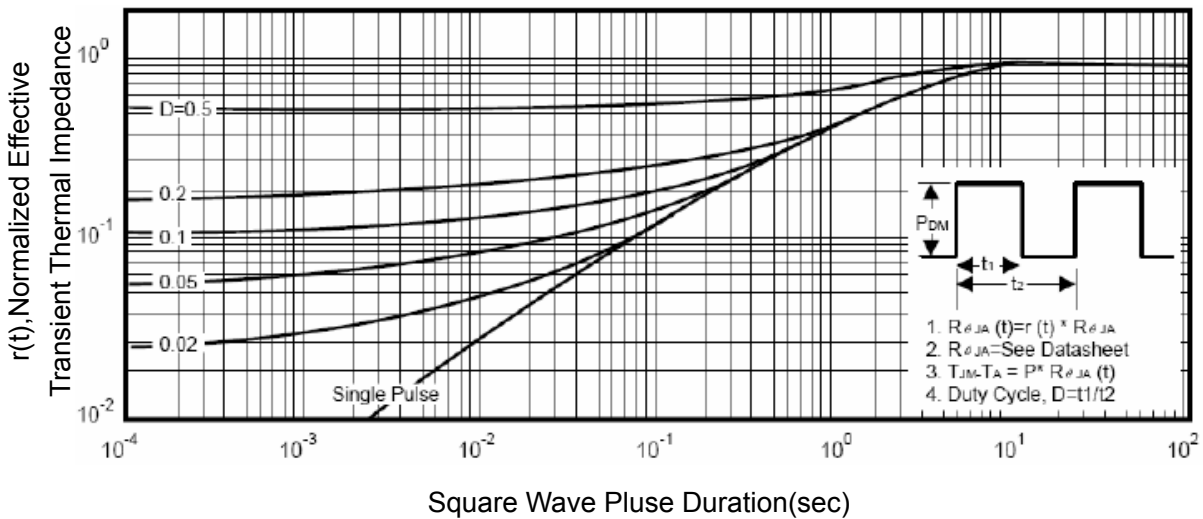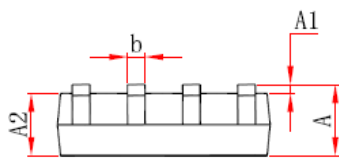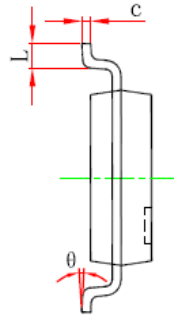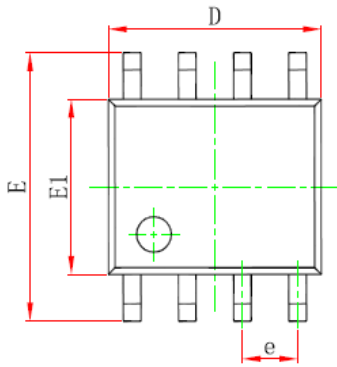

Square Wave Pluse Duration(sec)

Figure 14 Normalized Maximum Transient Thermal Impedance

SOP-8 Package information

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
θ	0°	8°	0°	8°

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