

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRF7854
▶ Overseas	Part Number	IRF7854
▶ Equivalent	Part Number	IRF7854

EV is the abbreviation of name EVVO

100V N-SGT Enhancement Mode MOSFET

General Description

IRF7854 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

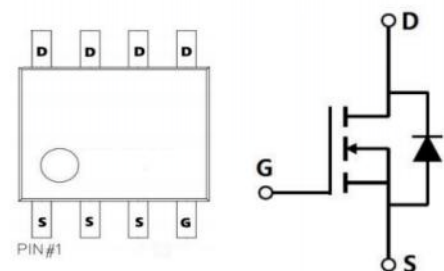
Applications

Consumer electronic power supply
Motor control
Synchronous-rectification
Isolated DC
Synchronous-rectification applications

Features

Low RDS(on) & FOM
Extremely low switching loss
Excellent stability and uniformity or Invertors

SOP-8L Pin Configuration



Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _A =25°C	Continuous Drain Current ¹	20	A
I _D @T _A =70°C	Continuous Drain Current ¹	42	A
I _{DM}	Pulsed Drain Current ²	20	A
EAS	Single Pulse Avalanche Energy ³	12	mJ
I _{AS}	Avalanche Current	9	A
P _D @T _A =25°C	Total Power Dissipation ⁴	3.1	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R _{θJA}	Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	40	°C/W
R _{θJA}	Thermal Resistance Junction-Ambient ¹	75	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	24	°C/W

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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=8A$	---	16	20	$m\Omega$
	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V, I_D=6A$	---	18	27	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=11.5A$	---	45	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=50V, V_{GS}=10V, I_D=11.5A$	---	35	---	nC
Q_g	Total Gate Charge (4.5V)		---	16	---	
Q_{gs}	Gate-Source Charge		---	8	---	
Q_{gd}	Gate-Drain Charge		---	4	---	
$T_d(on)$	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3\Omega, I_D=11.5A$	---	9	---	ns
T_r	Rise Time		---	4.5	---	
$T_d(off)$	Turn-Off Delay Time		---	35	---	
T_f	Fall Time		---	5.5	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	2550	---	pF
C_{oss}	Output Capacitance		---	305	---	
C_{rss}	Reverse Transfer Capacitance		---	12	---	
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	4	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=11.5A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	28	---	nS
Q_{rr}	Reverse Recovery Charge		---	120	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.3mH, I_{AS}=9A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

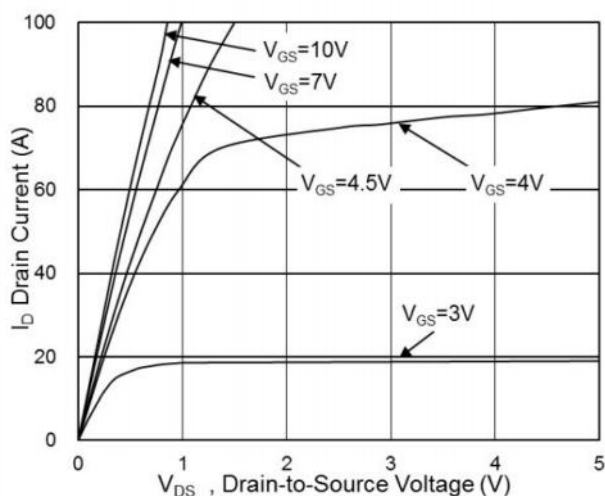


Fig.1 Typical Output Characteristics

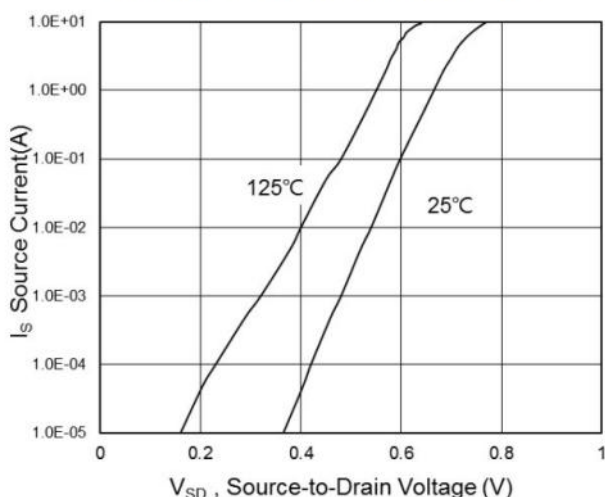


Fig.3 Source-Drain Forward Characteristics

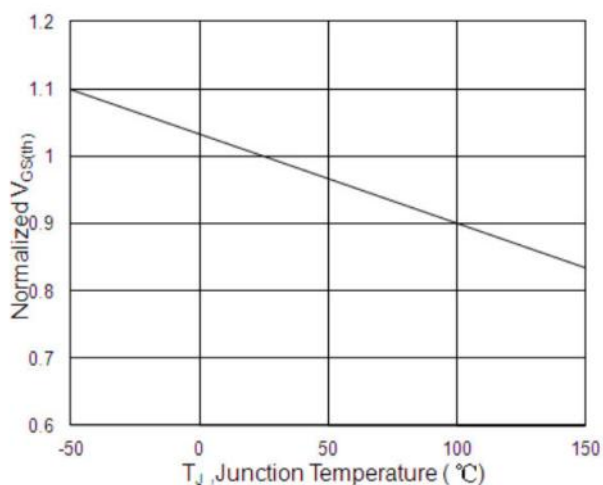


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

100V N-SGT Enhancement Mode MOSFET

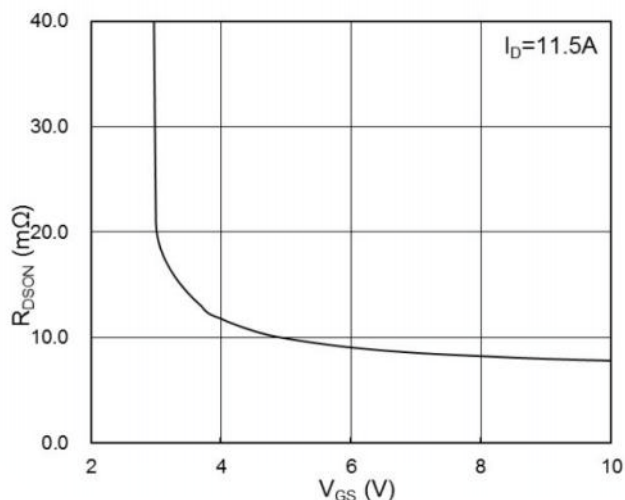


Fig.2 On-Resistance vs. G-S Voltage

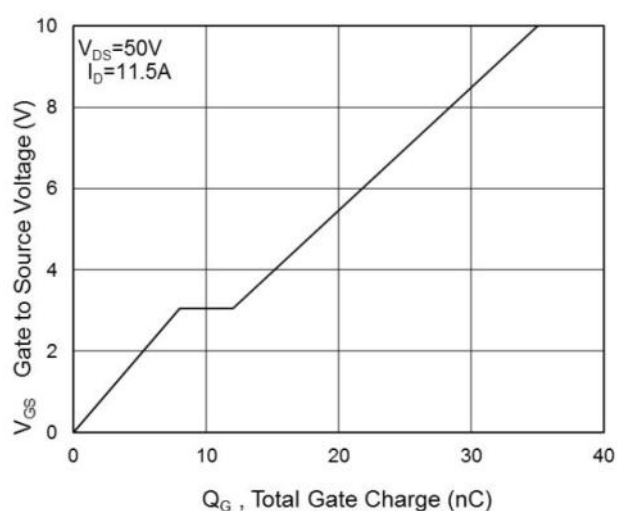


Fig.4 Gate-Charge Characteristics

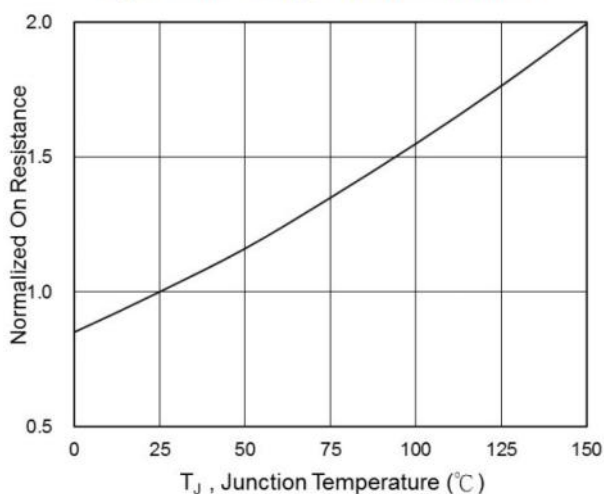


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

100V N-SGT Enhancement Mode MOSFET

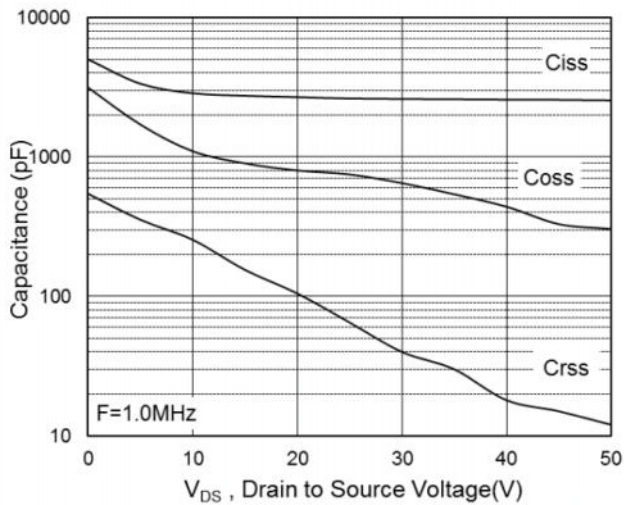


Fig.7 Capacitance

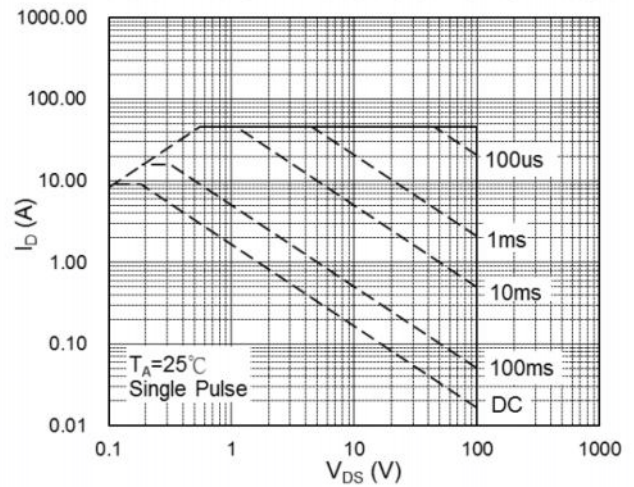


Fig.8 Safe Operating Area

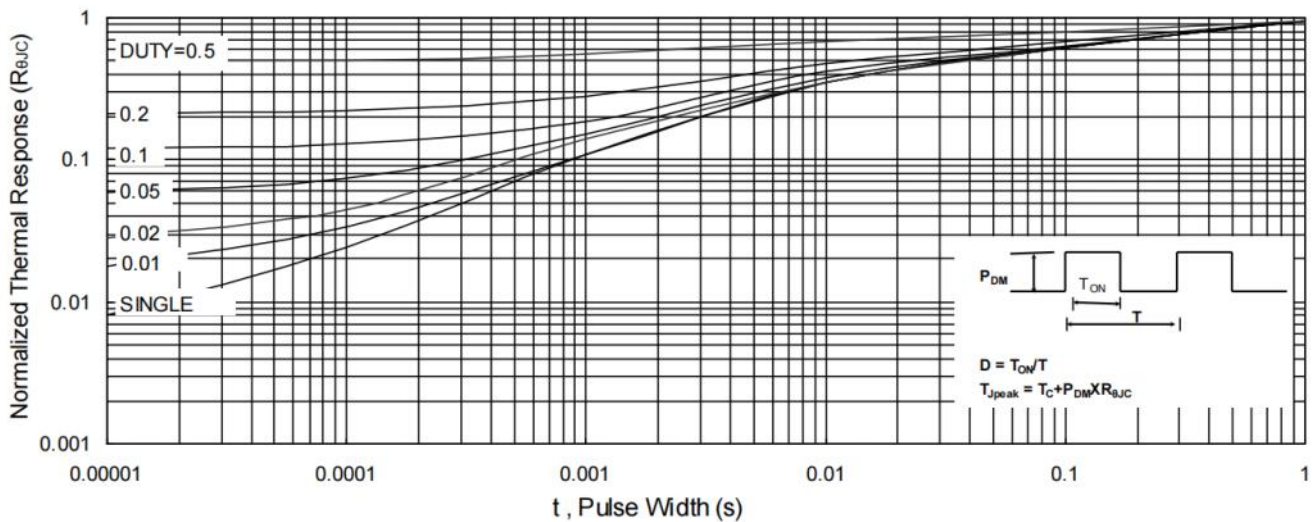


Fig.9 Normalized Maximum Transient Thermal Impedance

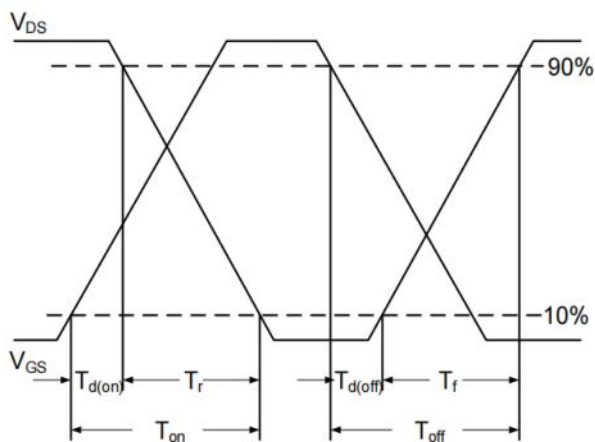


Fig.10 Switching Time Waveform

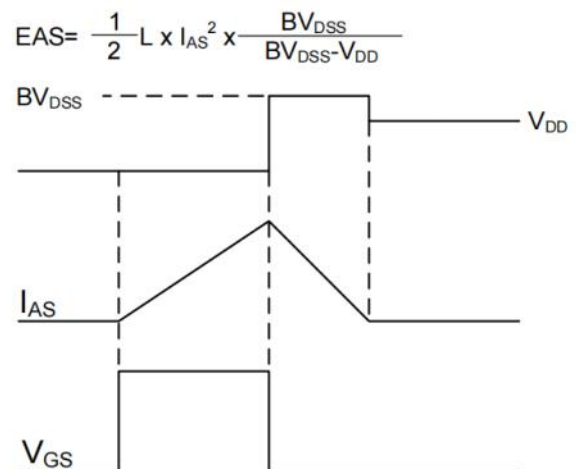
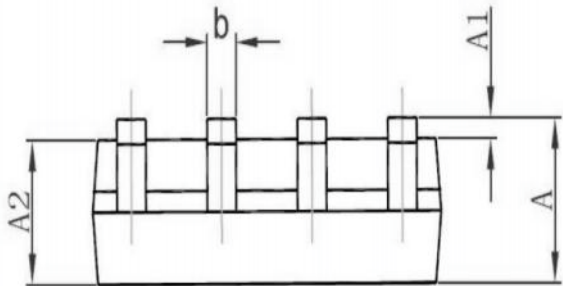
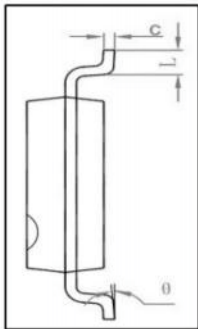
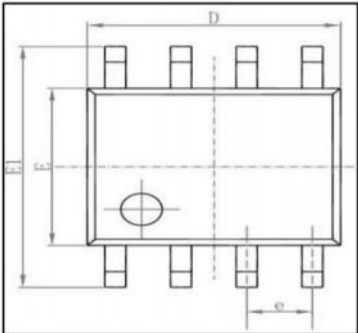


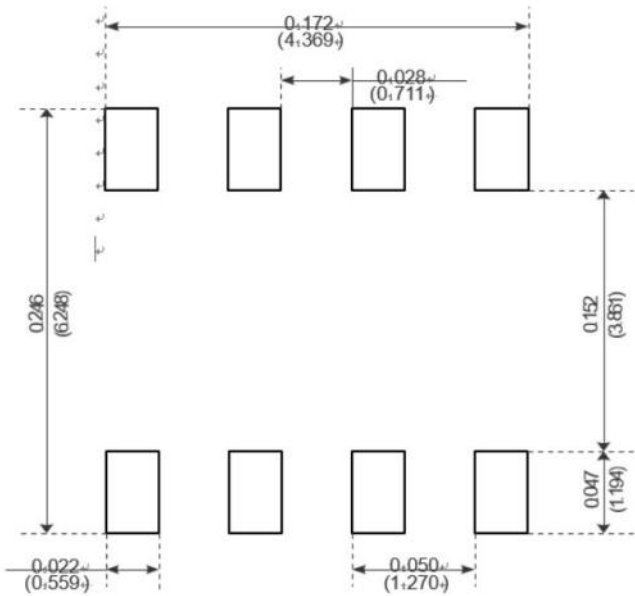
Fig.11 Unclamped Inductive Switching Waveform

100V N-SGT Enhancement Mode MOSFET

Package Mechanical Data-SOP-8



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°



Recommended Minimum Pads

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