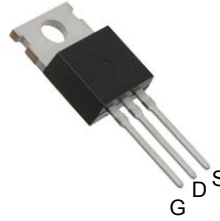
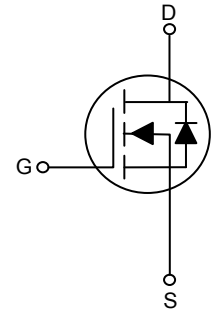


Main Product Characteristics

V_{DSS}	40V
$R_{DS(ON)}$	2.5mΩ
I_D	160A



TO-220



Schematic Diagram

Description

The SSFT4902 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous ($T_C=25^{\circ}C$)	I_D	160	A
Drain Current – Continuous ($T_C=100^{\circ}C$)		100	A
Drain Current – Pulsed ¹	I_{DM}	640	A
Single Pulse Avalanche Energy ²	E_{AS}	360	mJ
Single Pulse Avalanche Current ²	I_{AS}	85	A
Power Dissipation ($T_C=25^{\circ}C$)	P_D	184	W
Power Dissipation – Derate above 25°C		1.47	W/°C
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.68	°C/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static State Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=32V, V_{GS}=0V, T_J=85^{\circ}\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	---	2.1	2.5	m Ω
	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	---	2.6	3.5	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.6	2.5	V
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=15A$	---	45	---	S
Dynamic Characteristics						
Total Gate Charge ^{3, 4}	Q_g	$V_{DS}=20V, V_{GS}=4.5V, I_D=10A$	---	70	140	nC
Gate-Source Charge ^{3, 4}	Q_{gs}		---	15	32	
Gate-Drain Charge ^{3, 4}	Q_{gd}		---	40	80	
Turn-On Delay Time ^{3, 4}	$T_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, R_G=10\Omega, I_D=10A$	---	24.6	48	nS
Rise Time ^{3, 4}	T_r		---	62.8	120	
Turn-Off Delay Time ^{3, 4}	$T_{d(off)}$		---	224	440	
Fall Time ^{3, 4}	T_f		---	162	320	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	---	8000	12000	pF
Output Capacitance	C_{oss}		---	550	1000	
Reverse Transfer Capacitance	C_{rss}		---	420	800	
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	1.2	2.4	Ω
Guaranteed Avalanche Energy						
Single Pulse Avalanche Energy	EAS	$V_{DD}=25V, L=0.1\text{mH}, I_{AS}=30A$	45	---	---	mJ
Drain-Source Diode Characteristics						
Continuous Source Current	I_S		---	---	160	A
Pulsed Source Current ³	I_{SM}	$V_G=V_D=0V, \text{Force Current}$	---	---	640	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=20A, di/dt=100A/\mu S$	---	32	---	nS
Reverse Recovery Charge	Q_{rr}	$T_J=25^{\circ}\text{C}$	---	19	---	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=85A, R_G=25\Omega, \text{Starting } T_J=25^{\circ}\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu S$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

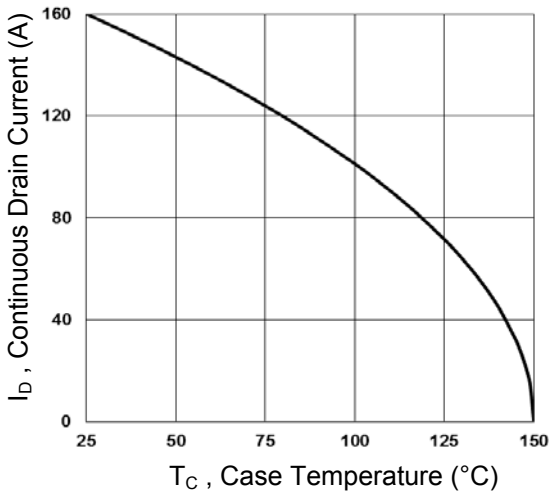


Fig.1 Continuous Drain Current vs. T_C

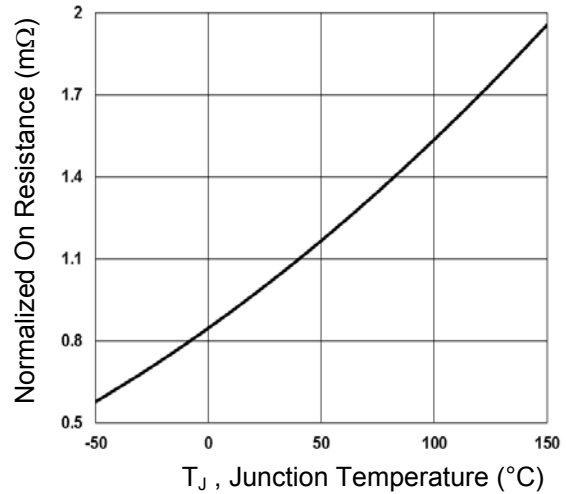


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

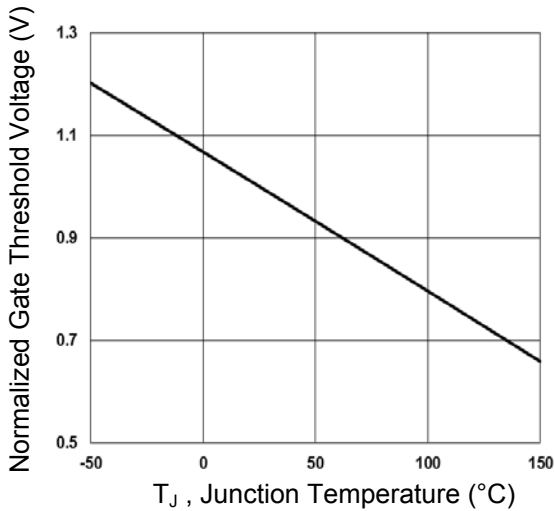


Fig.3 Normalized V_{th} vs. T_J

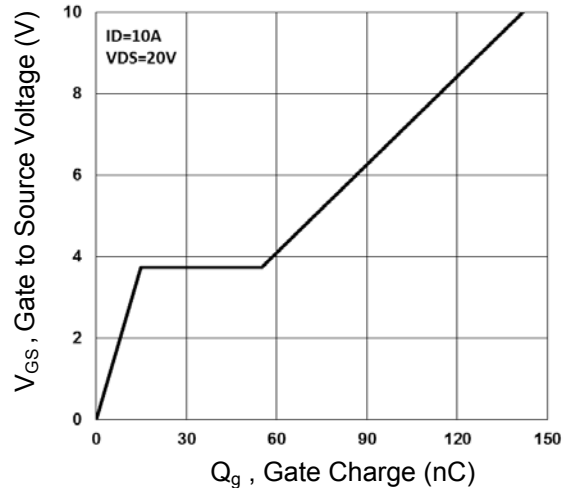


Fig.4 Gate Charge Waveform

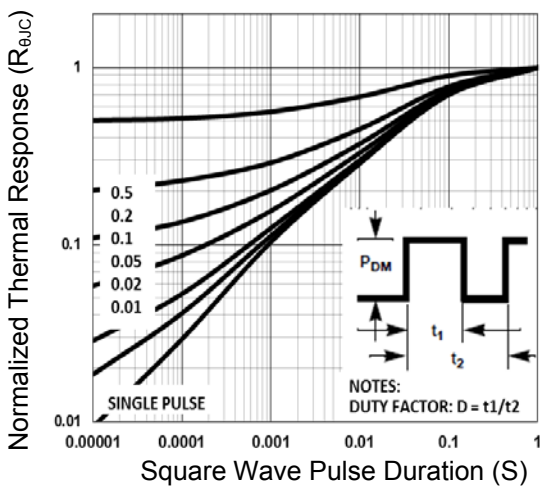


Fig.5 Normalized Transient Impedance

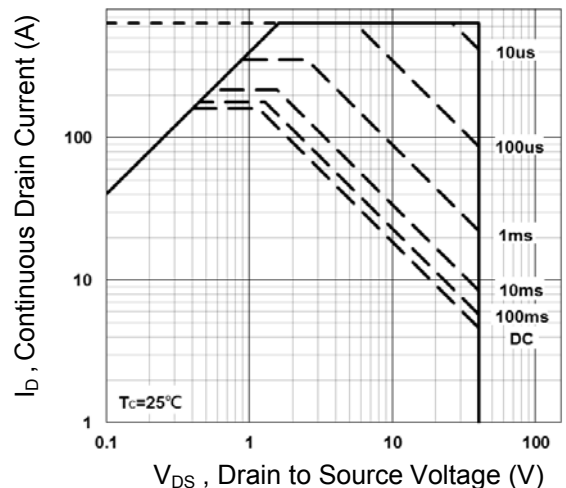


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

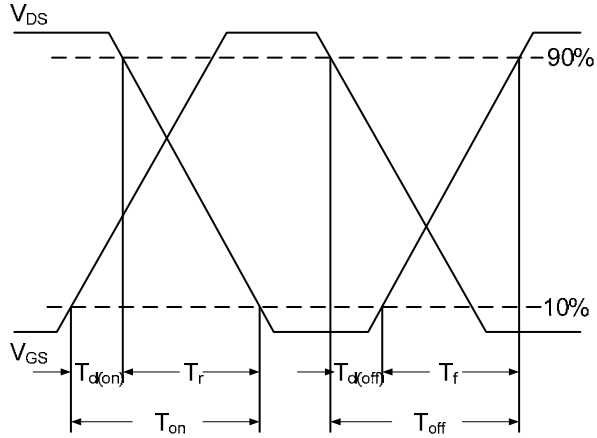


Fig.7 Switching Time Waveform

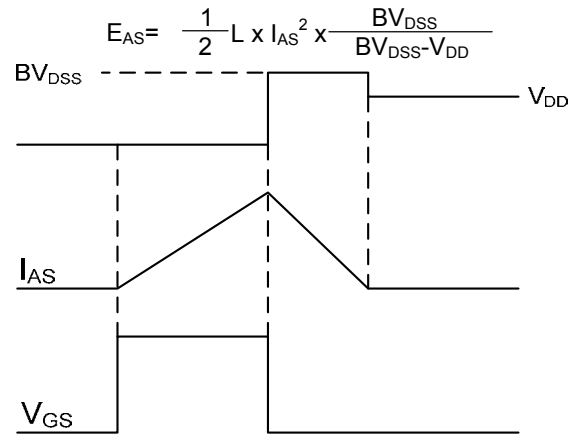
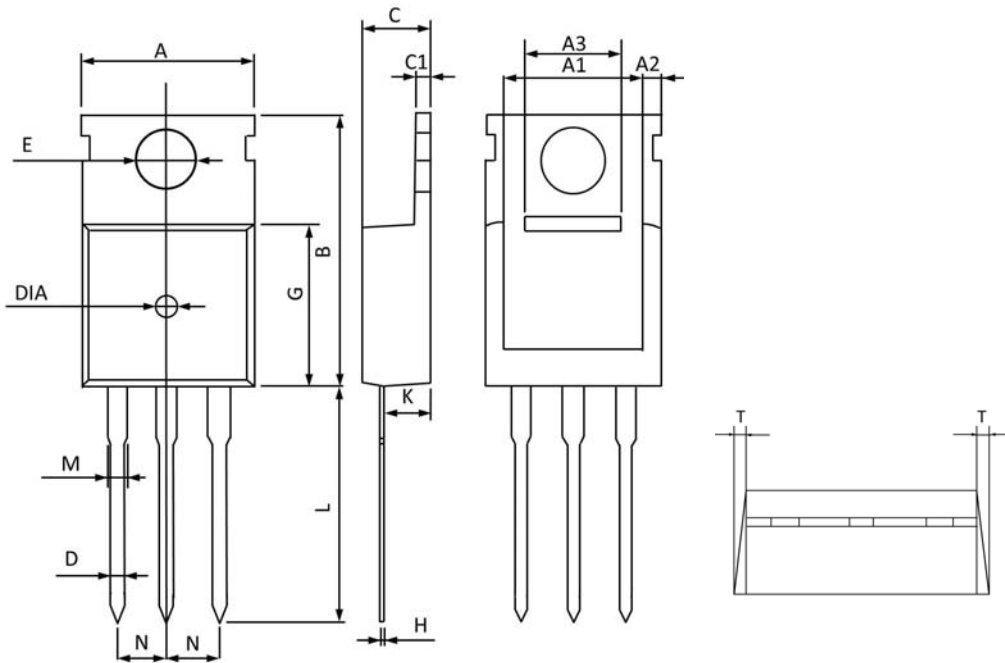


Fig.8 E_{AS} Waveform

Package Outline Dimensions TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.