

DESCRIPTION

The SSF4604 uses advanced trench technology MOSFET to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFET may be used in power inverters, and other applications.

GENERAL FEATURES

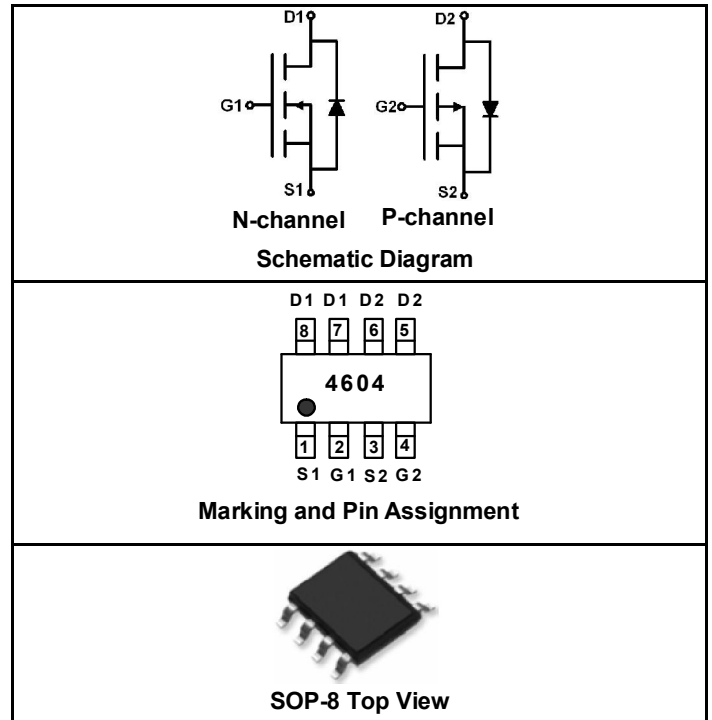
●N-Channel

$V_{DS} = 30V, I_D = 6.9A$
 $R_{DS(ON)} < 44m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 28m\Omega @ V_{GS}=10V$

●P-Channel

$V_{DS} = -30V, I_D = -5A$
 $R_{DS(ON)} < 87m\Omega @ V_{GS}=-4.5V$
 $R_{DS(ON)} < 52m\Omega @ V_{GS}=-10V$

- High Power and current handling capability
- Lead free product
- Surface Mount Package



PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape Width	Quantity
4604	SSF4604	SOP-8	Ø330mm	12mm	2500 units

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	± 20	± 20	V
Continuous Drain Current	$T_A=25^\circ C$	I_D	6.9	-5	A
	$T_A=70^\circ C$		6.0	-4.0	
Pulsed Drain Current (Note 1)		I_{DM}	30	-20	A
Maximum Power Dissipation	$T_A=25^\circ C$	P_D	2.0	2.0	W
	$T_A=70^\circ C$		1.35	1.44	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 To 150	-55 To 150	$^\circ C$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	$^\circ C/W$
		P-Ch	62.5	

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						

Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	N-Ch	30			V
		V _{GS} =0V I _D =-250μA	P-Ch	-30			
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V	N-Ch			1	μA
		V _{DS} =-24V, V _{GS} =0V	P-Ch			-1	
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	N-Ch			±100	nA
			P-Ch			±100	
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	N-Ch	1	1.9	3	V
		V _{DS} =V _{GS} , I _D =-250μA	P-Ch	-1	-1.8	-3	
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6.9A	N-Ch		22.5	28	mΩ
		V _{GS} =-10V, I _D =-5.0A	P-Ch		46	52	
		V _{GS} =4.5V, I _D =5A	N-Ch		40	44	
		V _{GS} =-4.5V, I _D =-4A	P-Ch		65	87	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6.9A	N-Ch	10	15.4		S
		V _{DS} =-5V, I _D =-5A	P-Ch	6	8.6		
DYNAMIC PARAMETERS							
Input Capacitance	C _{ISS}	N-Ch V _{GS} =0V, V _{DS} =15V, f=1MHz P-Ch V _{GS} =0V, V _{DS} =-15V, f=1MHz	N-Ch		680		pF
			P-Ch		700		
Output Capacitance	C _{OSS}		N-Ch		100		
			P-Ch		120		
Reverse Transfer Capacitance	C _{RSS}		N-Ch		77		
			P-Ch		75		
SWITCHING CHARACTERISTICS (Note 4)							
Turn-on Delay Time	t _{d(on)}	N-Ch V _{DD} =15V, R _L =2.2Ω V _{GEN} =10V, R _{GEN} =3Ω	N-Ch		4.6		nS
			P-Ch		8.3		
Turn-on Rise Time	t _r		N-Ch		4.1		nS
			P-Ch		5		
Turn-Off Delay Time	t _{d(off)}	P-Ch V _{DD} =-15V, R _L =3Ω V _{GEN} =-10V, R _{GEN} =3Ω	N-Ch		20.6		nS
			P-Ch		29		
Turn-Off Fall Time	t _f		N-Ch		5.2		nS
			P-Ch		14		
Total Gate Charge	Q _g	N-Ch V _{DS} =15V, I _D =6.9A, V _{GS} =10V	N-Ch		14		nC
			P-Ch		14.5		
Gate-Source Charge	Q _{gs}		N-Ch		1.8		nC
			P-Ch		2		
Gate-Drain Charge	Q _{gd}	P-Ch V _{DS} =-15V, I _D =-5A, V _{GS} =-10V	N-Ch		3.2		nC
			P-Ch		3.8		

DRAIN-SOURCE DIODE CHARACTERISTICS

Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1A$	N-Ch		0.76	1	V
		$V_{GS}=0V, I_S=-1A$	P-Ch		-0.77	-1	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

N-Channel THERMAL CHARACTERISTICS

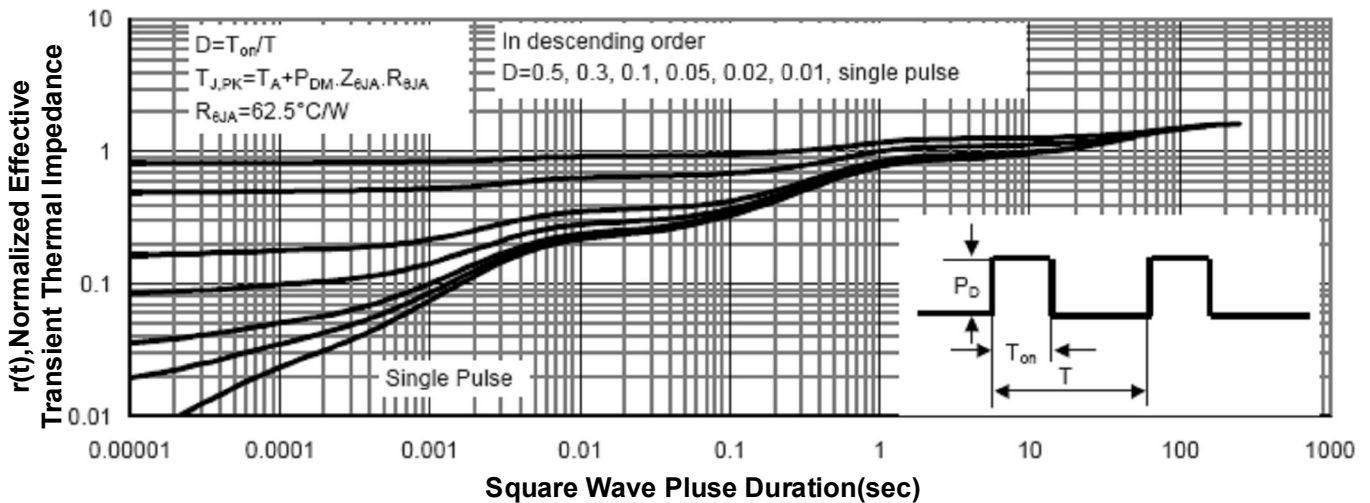


Figure 1: Normalized Maximum Transient Thermal Impedance

P-Channel THERMAL CHARACTERISTICS

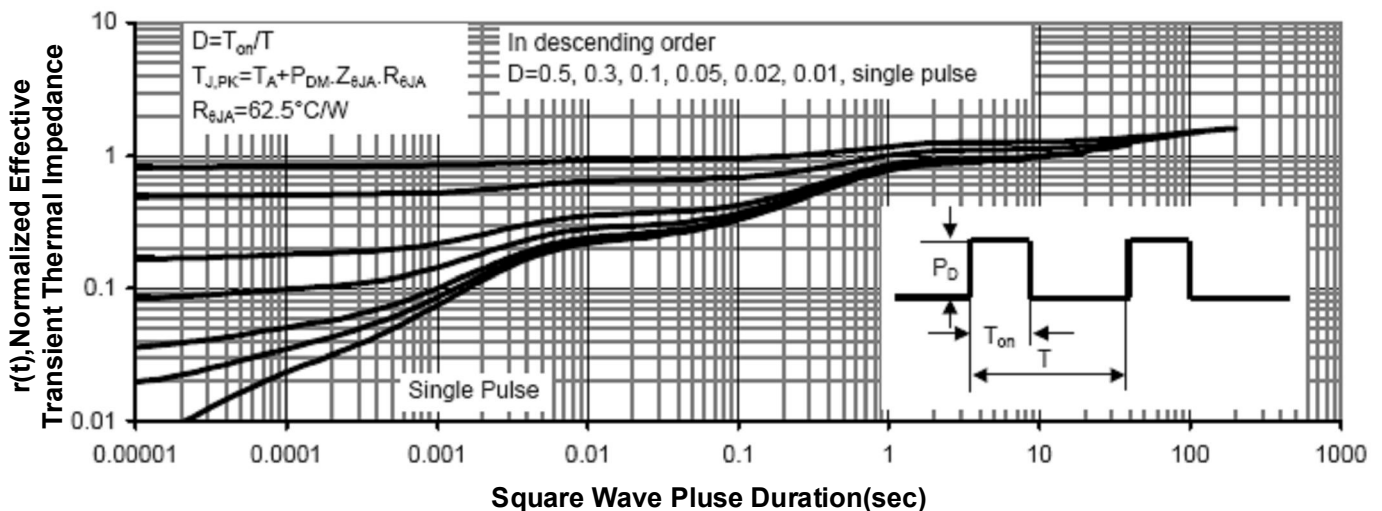
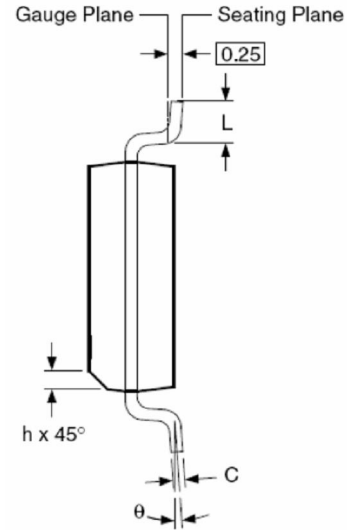
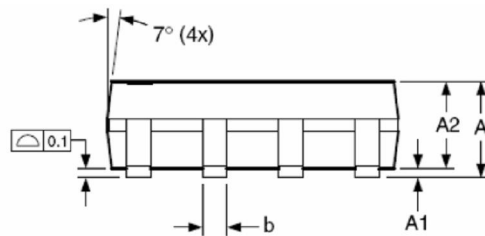
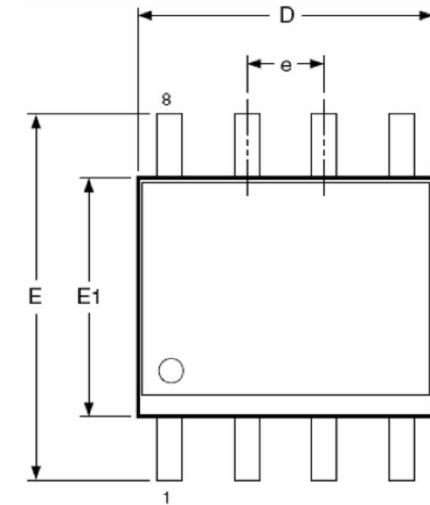


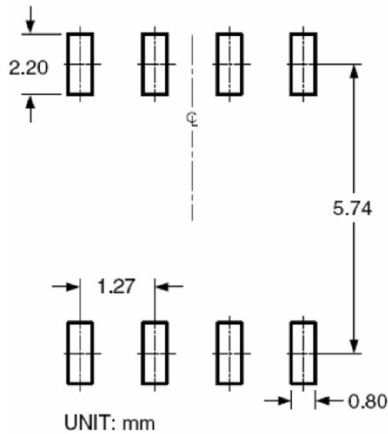
Figure 2: Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	0.228	0.236	0.244
h	0.010	—	0.020
L	0.016	—	0.050
θ	0°	—	8°

NOTES:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact