

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

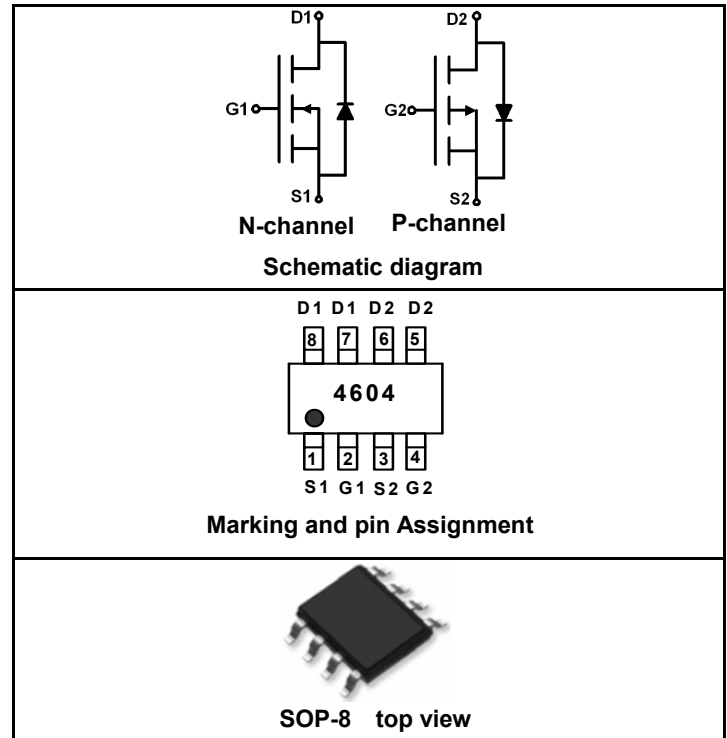
●N-Channel

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

●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 handing capability
- Lead free product is acquired
- 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(TA=25°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	°C

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	N-Ch	30			V
		$V_{GS}=0V, I_D=-250\mu A$	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}	$V_{GS}=\pm 20V, V_{DS}=0V$	N-Ch			± 100	nA
			P-Ch			± 100	
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	N-Ch	1	1.9	3	V
		$V_{DS}=V_{GS}, I_D=-250\mu A$	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	m Ω
		$V_{GS}=-10V, I_D=-5.0A$	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 $V_{GS}=0V, V_{DS}=15V, f=1MHz$	N-Ch		680		pF
Output Capacitance	C_{oss}		P-Ch		700		
Reverse Transfer Capacitance	C_{rss}	P-Ch $V_{GS}=0V, V_{DS}=-15V, f=1MHz$	N-Ch		100		
			P-Ch		120		
			N-Ch		77		
			P-Ch		75		
SWITCHING CHARACTERISTICS (Note 4)							
Turn-on Delay Time	$t_{d(on)}$	N-Ch $V_{DD}=15V, R_L=2.2\Omega$ $V_{GEN}=10V, R_{GEN}=3\Omega$	N-Ch		4.6		nS
Turn-on Rise Time	t_r		P-Ch		8.3		
Turn-Off Delay Time	$t_{d(off)}$	P-Ch $V_{DD}=-15V, R_L=3\Omega$ $V_{GEN}=-10V, R_{GEN}=3\Omega$	N-Ch		4.1		nS
			P-Ch		5		
Turn-Off Fall Time	t_f		N-Ch		20.6		nS
			P-Ch		29		
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

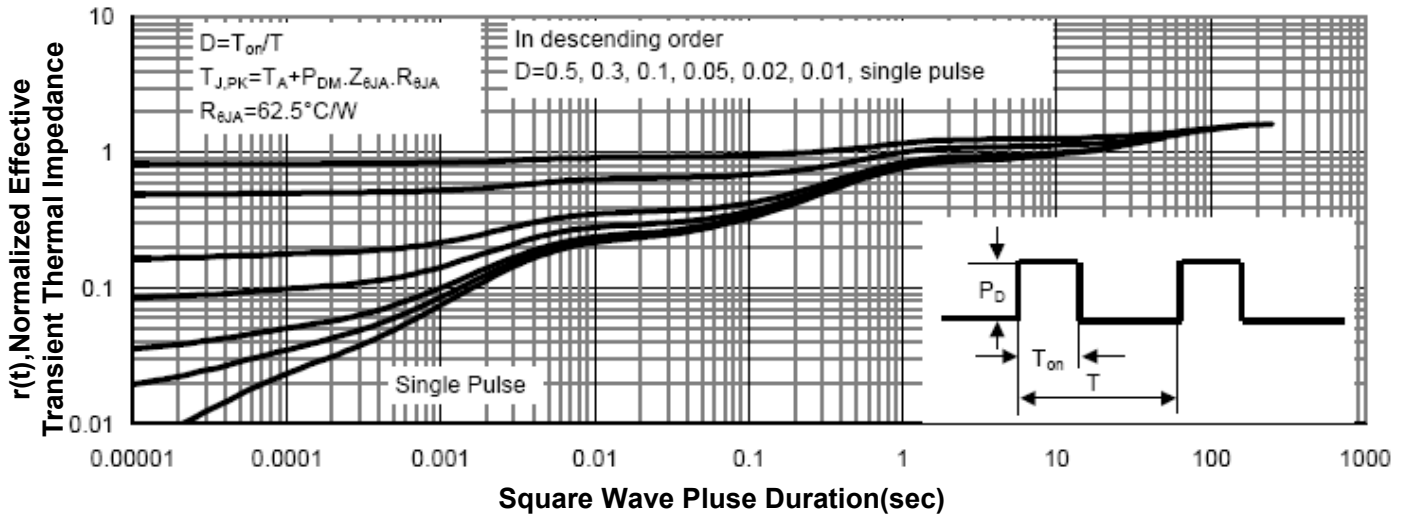


Figure 1: Normalized Maximum Transient Thermal Impedance

P-Channel THERMAL CHARACTERISTICS

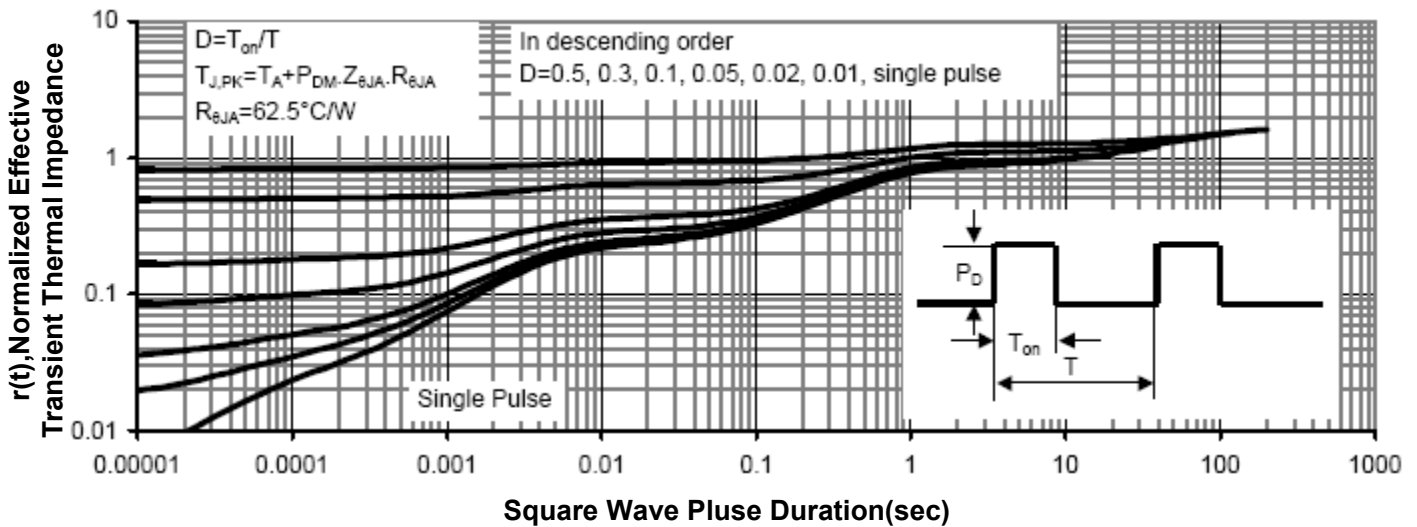
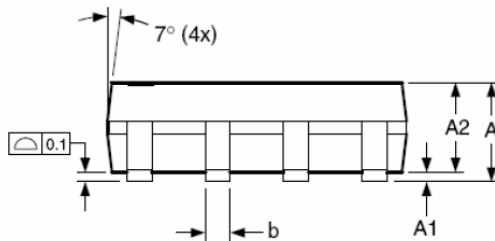
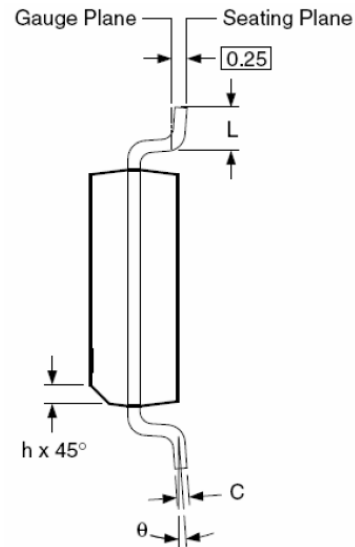
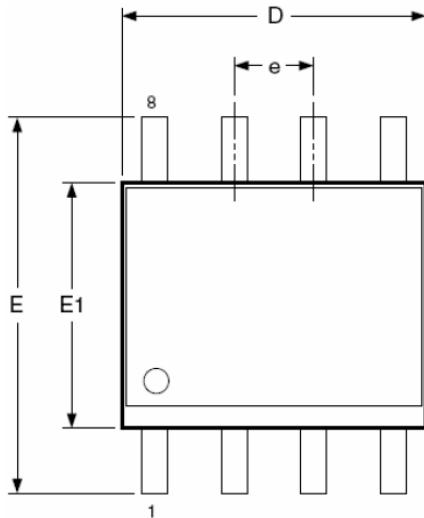


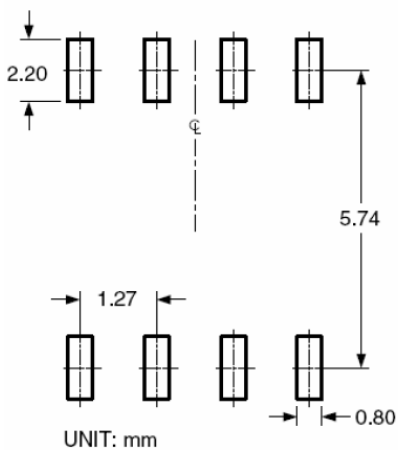
Figure 2: Normalized Maximum Transient Thermal Impedance

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.

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