

DESCRIPTION

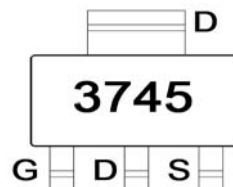
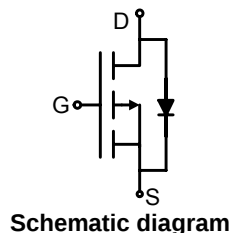
The SSF3745 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- $V_{DS} = -30V, I_D = -6.2A$
 $R_{DS(ON)} < 50m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 100m\Omega @ V_{GS} = -4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3745	SSF3745	SOT-223	-	-	-

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D(25^\circ C)$	-6.2	A
	$I_D(70^\circ C)$	-5	A
	I_{DM}	-20	A
Maximum Power Dissipation	P_D	2.7	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	45	°C/W
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V

Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1		-3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-5.3A			50	mΩ
		V _{GS} =-4.5V, I _D =-4.2A			100	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-20A	5			S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1.0MHz		554		PF
Output Capacitance	C _{oss}			246		PF
Reverse Transfer Capacitance	C _{rss}			170		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V, R _{GEN} =3Ω I _D =1A		14		nS
Turn-on Rise Time	t _r			10		nS
Turn-Off Delay Time	t _{d(off)}			24		nS
Turn-Off Fall Time	t _f			19		nS
Total Gate Charge	Q _g	V _{DS} =-30V, I _D =-20A, V _{GS} =-10V		11.7		nC
Gate-Source Charge	Q _{gs}			3.5		nC
Gate-Drain Charge	Q _{gd}			7.2		nC
Body Diode Reverse Recovery Time	T _{rr}	I _F =-20A, dI/dt=100A/μs		32		nS
Body Diode Reverse Recovery Charge	Q _{rr}			21		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-1A			-1.2	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in² 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.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

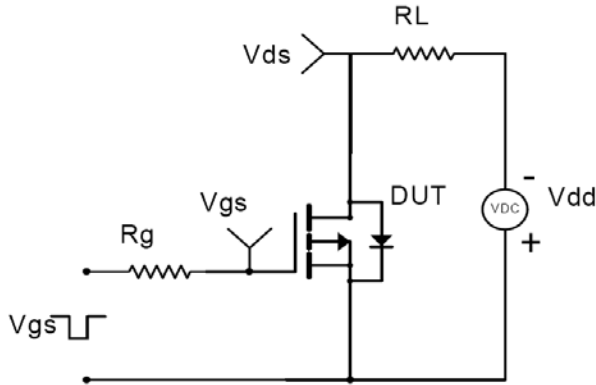


Figure 1: Switching Test Circuit

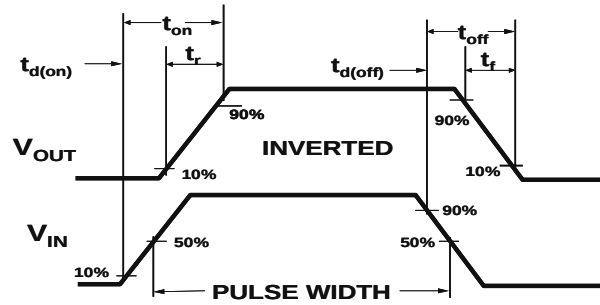


Figure 2: Switching Waveforms

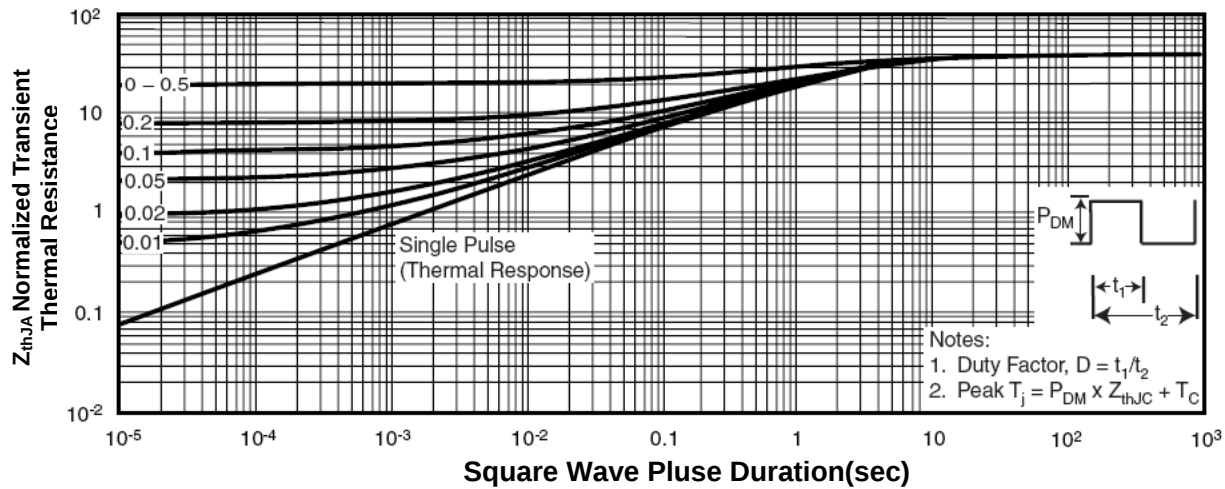
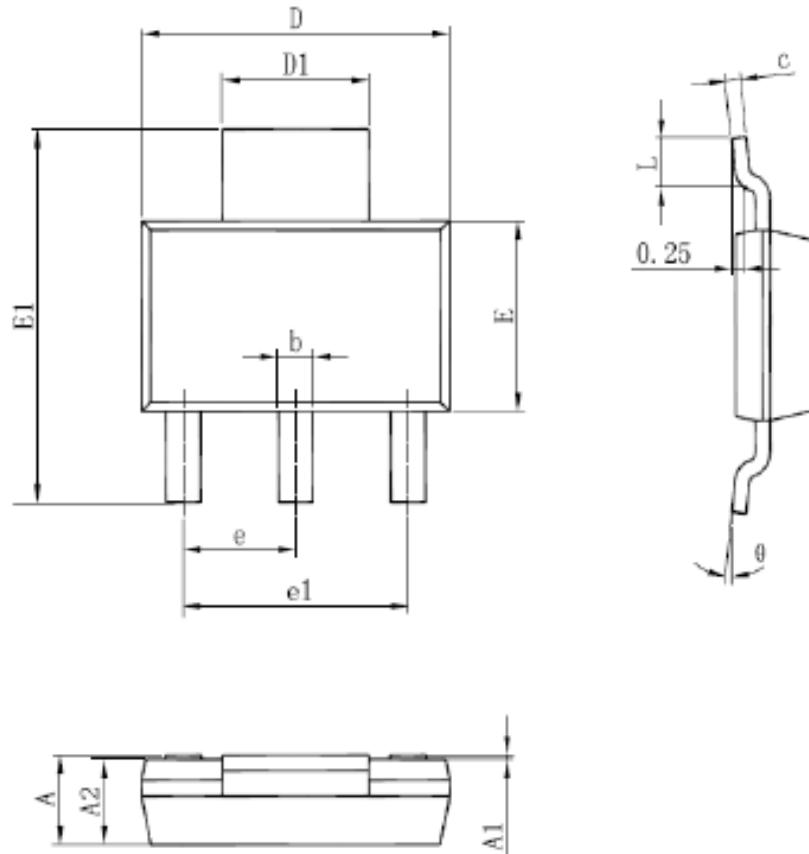


Figure 3 Normalized Maximum Transient Thermal Impedance

SOT-223 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

NOTES:

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

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