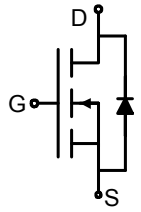
SSF3420

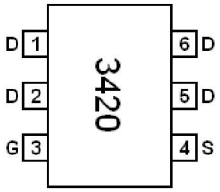
30V N-Channel MOSFET

DESCRIPTION

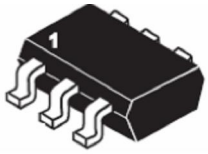
The SSF3420 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge .This device is suitable for use as a load switch or in PWM applications.



Schematic Diagram



Marking and Pin Assignment



SOT23-6 Top View

GENERAL FEATURES

- V_{DS} = 30V,I_D =6.3A
  $R_{DS(ON)}$ < 33mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V
- High Power and current handing capability
- Lead free product
- Surface Mount Package

APPLICATIONS

- PWM applications
- Load switch
- Power management

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape Width	Quantity
3420	SSF3420	SOT23-6	Ø180mm	8mm	3000 units

ABSOLUTE MAXIMUM RATINGS (T_A=25℃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℃）	6.3	A
	I_D（70℃）	4.8	
	I_{DM}	20	A
Maximum Power Dissipation	P_D	1.6	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	78	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.9	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5.5A		26	33	mΩ
		V_{GS}=10V, I_D=6.3A		20	25	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=6.3A		10		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz		600		PF
Output Capacitance	C_{oss}			150		PF
Reverse Transfer Capacitance	C_{rss}			70		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V,V_{GS}=10V,R_{GEN}=6Ω I_D=1A		8		nS
Turn-on Rise Time	t_r			4		nS
Turn-Off Delay Time	$t_{d(off)}$			22		nS
Turn-Off Fall Time	t_f			4		nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=6.3A,V_{GS}=10V		10		nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			2		nC
Body Diode Reverse Recovery Time	T_{rr}	I_F=6.3A, dI/dt=100A/μs		18		nS
Body Diode Reverse Recovery Charge	Q_{rr}			9		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=1.3A		0.8	1.2	V

NOTES:

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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

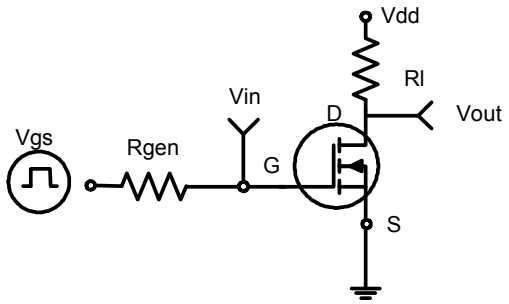


Figure 1:Switching Test Circuit

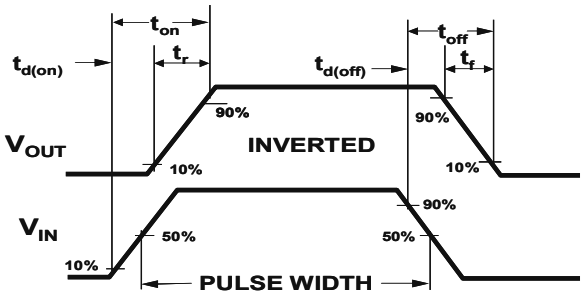


Figure 2:Switching Waveforms

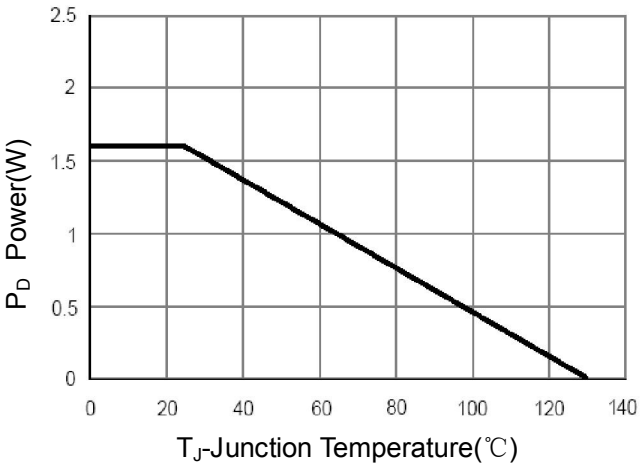


Figure 3 Power Dissipation

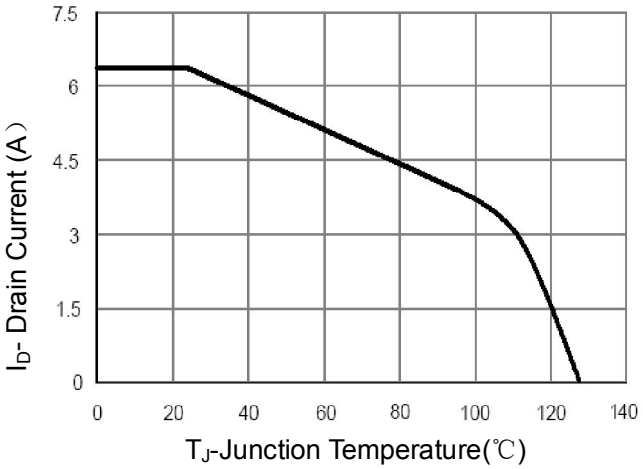


Figure 4 Drain Current

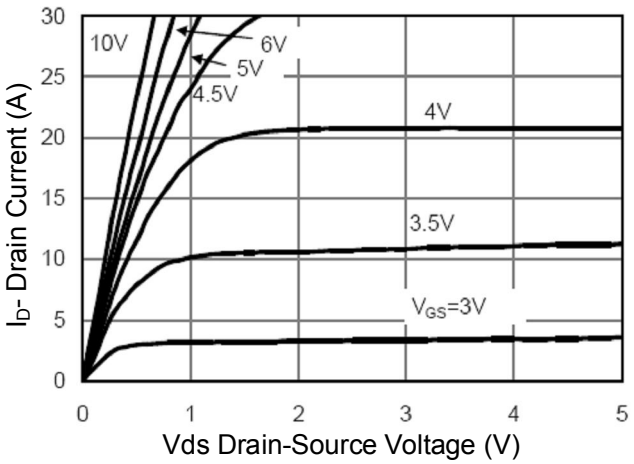


Figure 5 Output CHARACTERISTICS

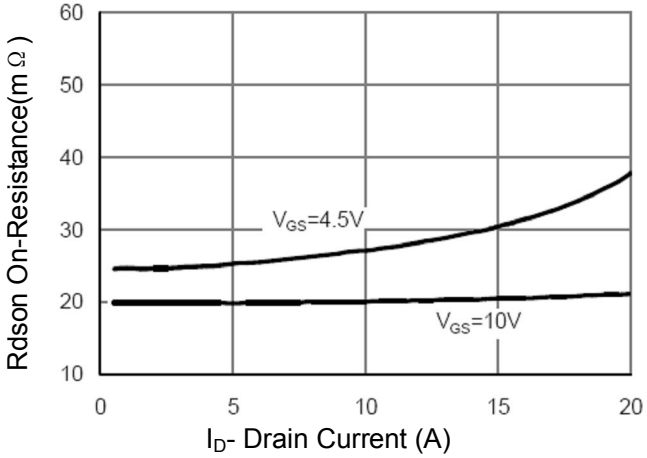


Figure 6 Drain-Source On-Resistance

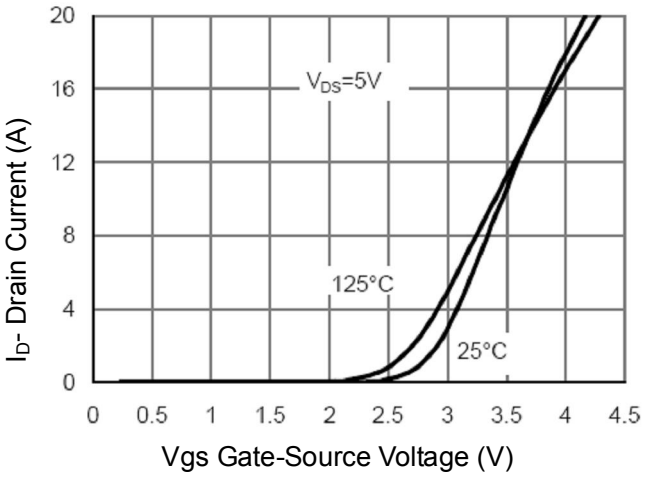


Figure 7 Transfer Characteristics

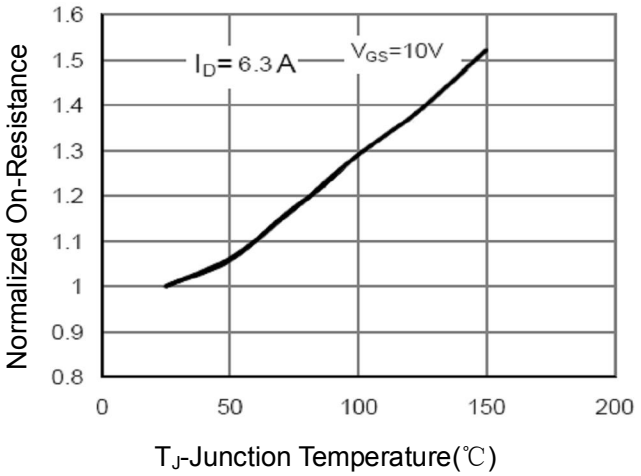


Figure 8 Drain-Source On-Resistance

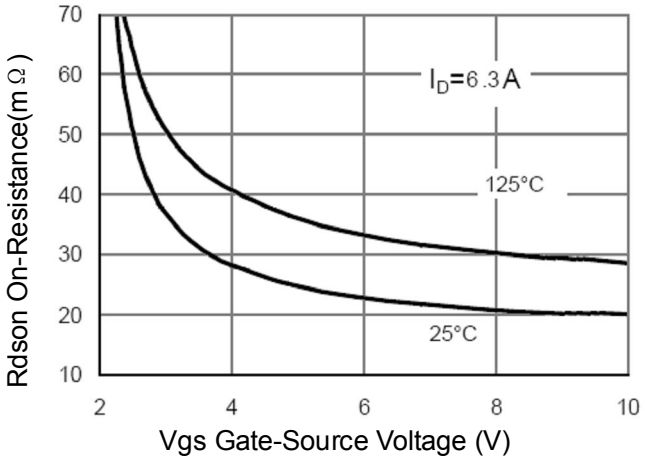


Figure 9 Rdson vs Vgs

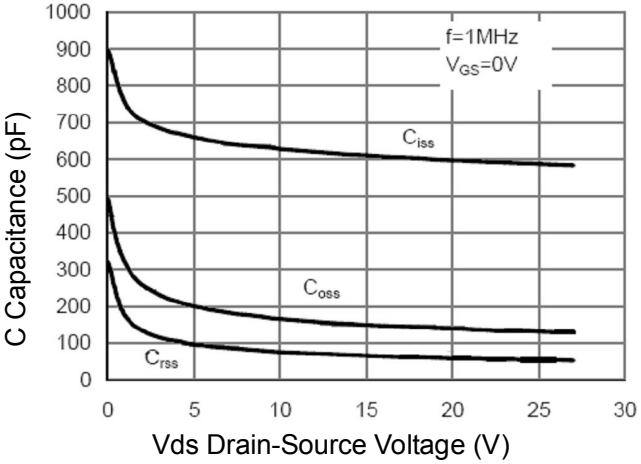
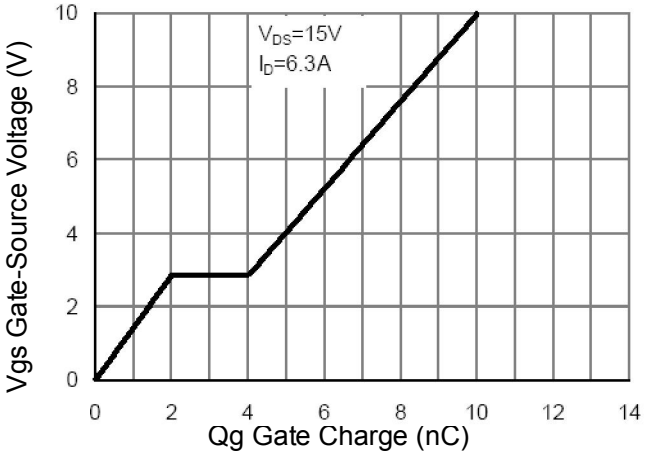


Figure 10 Capacitance vs Vds



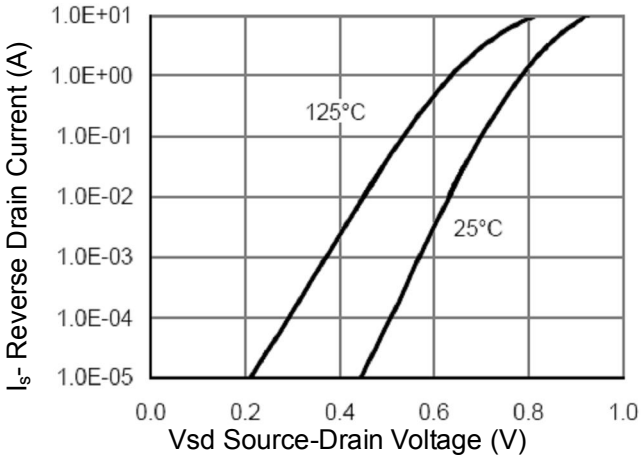


Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

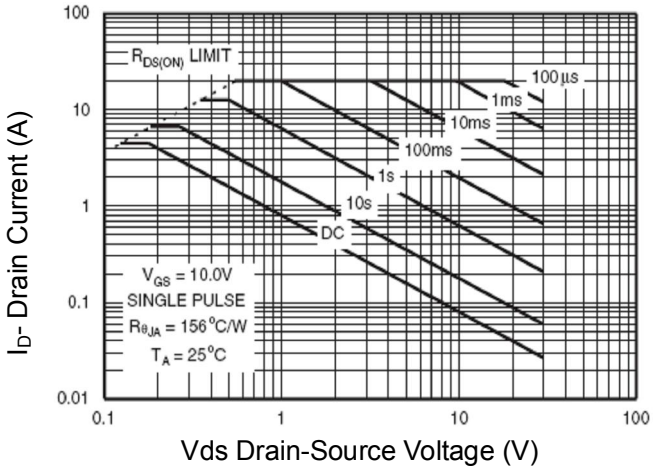
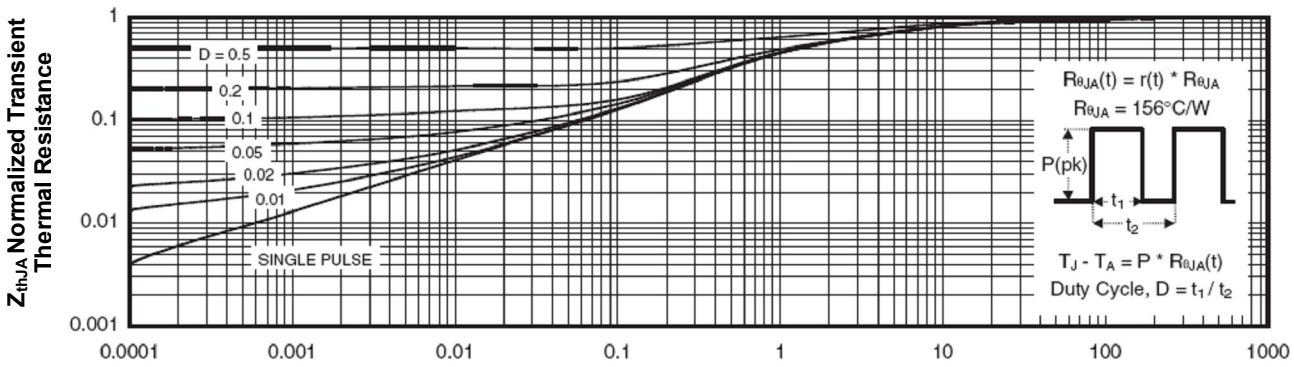


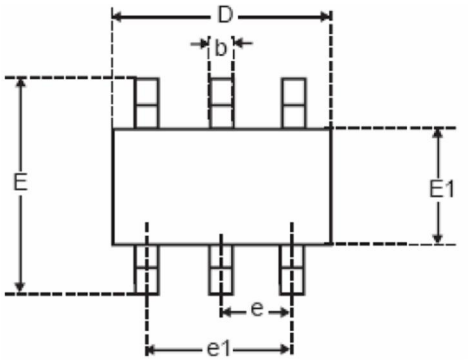
Figure 13 Safe Operation Area

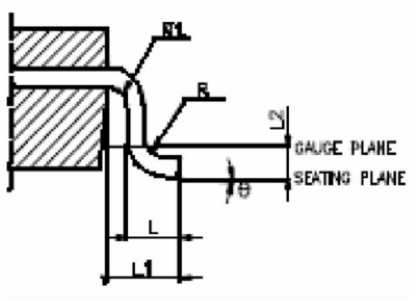


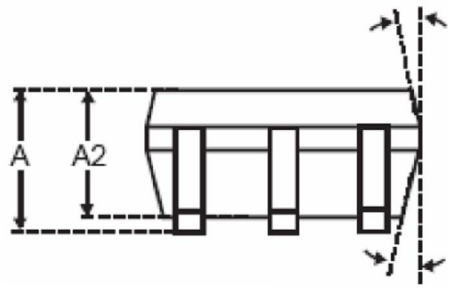
Square Wave Pluse Duration(sec)
Figure 14 Normalized Maximum Transient Thermal Impedance

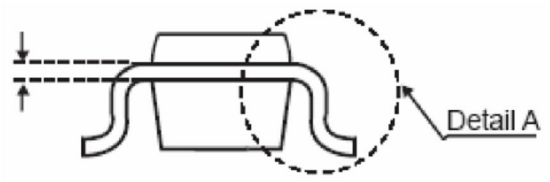
SOT23-6 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)









SYMBOLS	MILLMETERS		
	MIN.	NOM.	MAX.
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D	2.90 BSC.		
E	2.80 BSC.		
E1	1.60 BSC.		
e	0.95 BSC.		
e1	1.90 BSC.		
L	0.30	0.45	0.60
L1	0.60 REF		
L2	0.25 BSC.		
R	0.10		
R1	0.10		0.25
θ	0°	4°	8°
θ1	5°	10°	15°

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.