



SSF3420

30V N-Channel MOSFET

DESCRIPTION

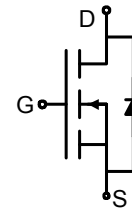
The SSF3420 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

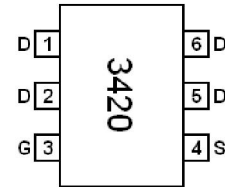
- $V_{DS} = 30V, I_D = 6.3A$
 $R_{DS(ON)} < 33m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=10V$
- High Power and current handling capability
- Lead free product
- Surface Mount Package

APPLICATIONS

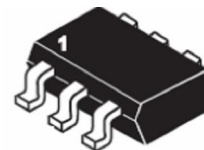
- PWM applications
- Load switch
- Power management



Schematic Diagram



Marking and Pin Assignment



SOT23-6 Top View

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 ($T_A=25^{\circ}C$ 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)	$I_D (25^{\circ}C)$	6.3	A
	$I_D (70^{\circ}C)$	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	$^{\circ}C$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	78	$^{\circ}C/W$
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30V N-Channel MOSFET

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	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 _{iss}	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 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

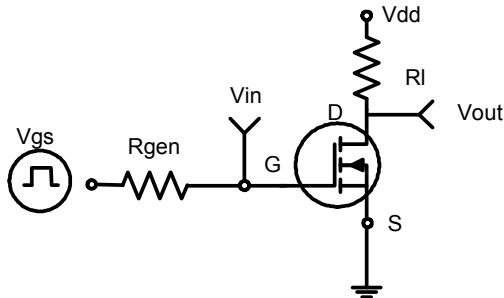


Figure 1: Switching Test Circuit

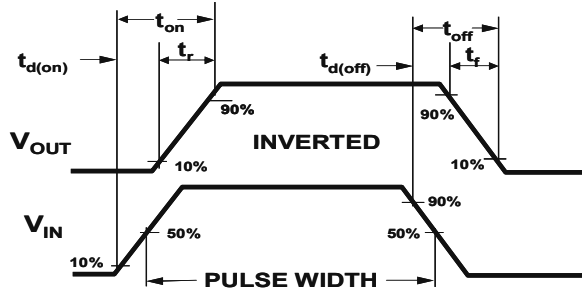


Figure 2: Switching Waveforms

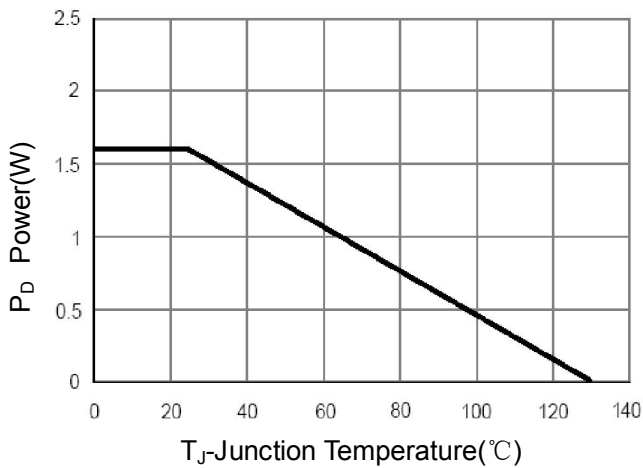


Figure 3 Power Dissipation

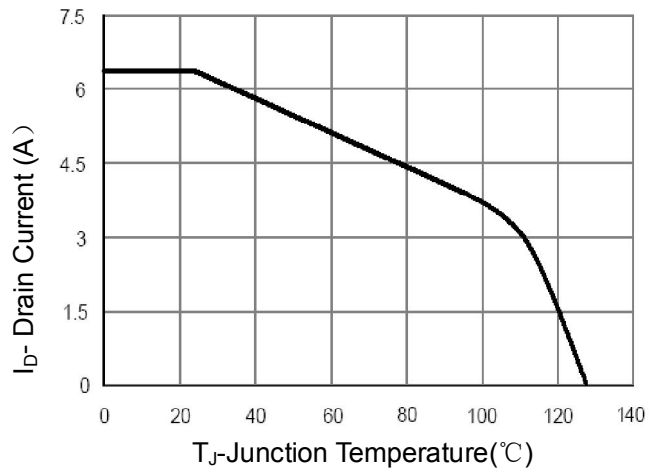


Figure 4 Drain Current

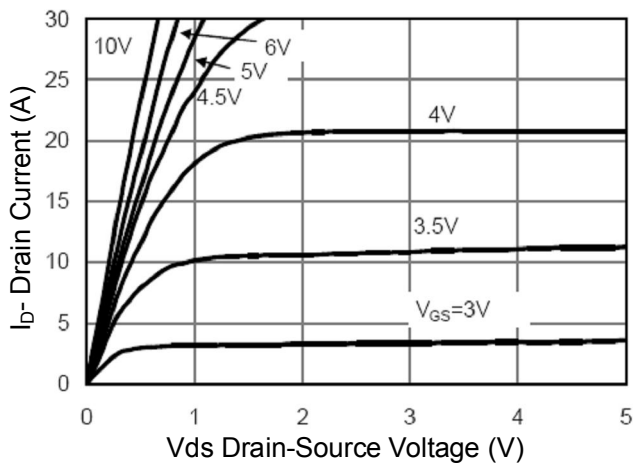


Figure 5 Output CHARACTERISTICS

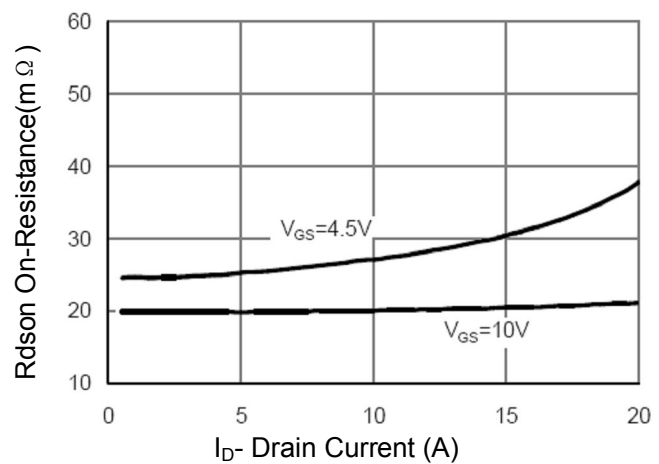


Figure 6 Drain-Source On-Resistance

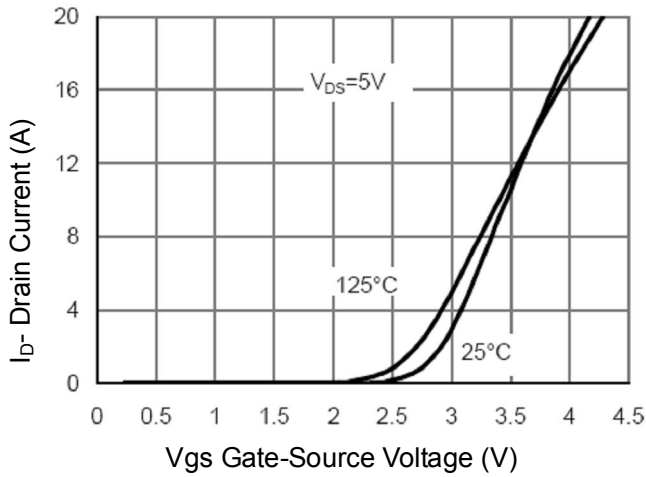


Figure 7 Transfer Characteristics

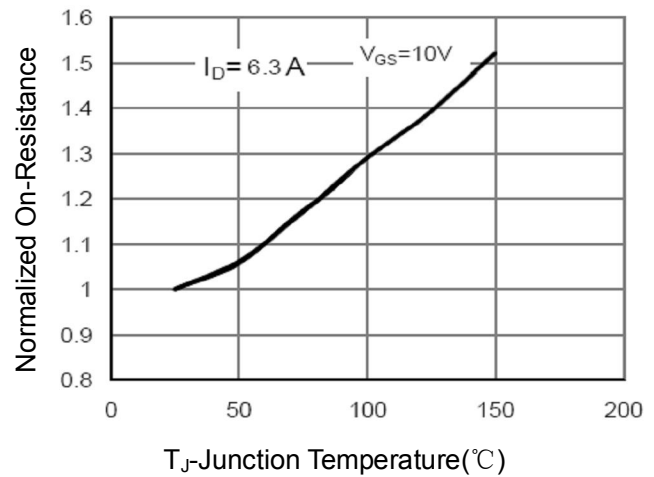


Figure 8 Drain-Source On-Resistance

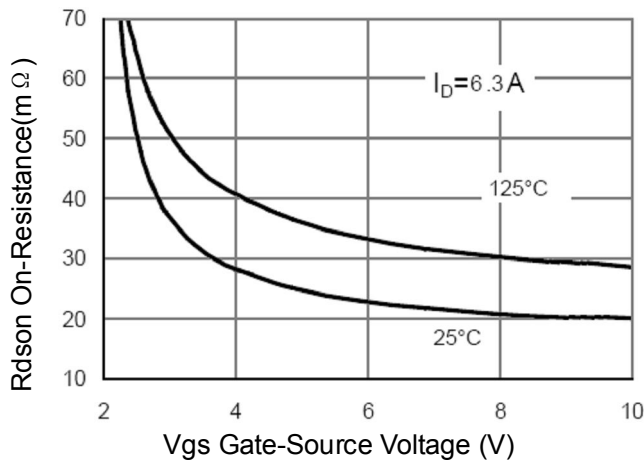


Figure 9 $R_{DS(on)}$ vs V_{GS}

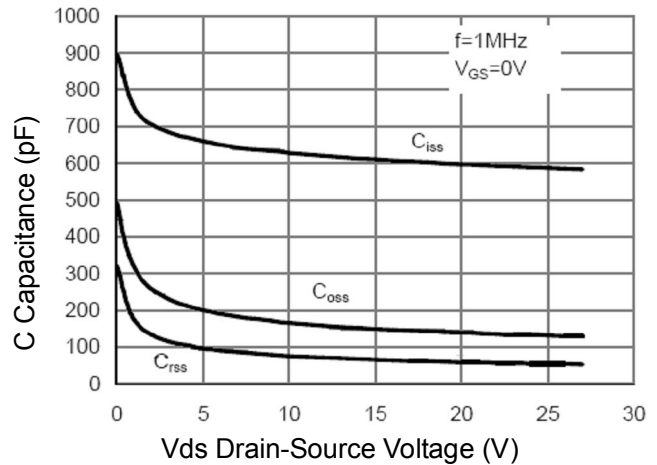


Figure 10 Capacitance vs V_{DS}

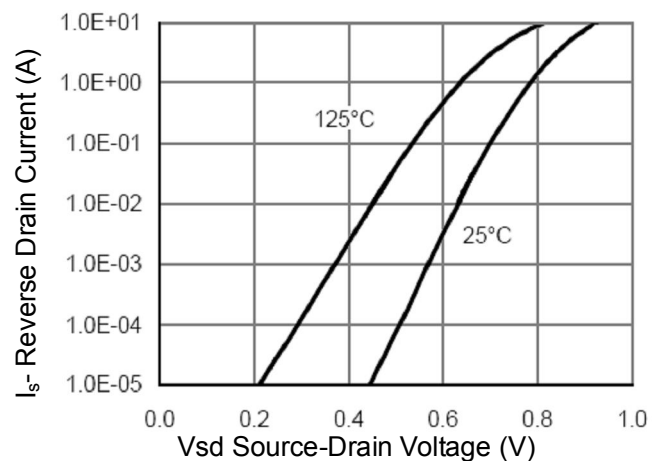
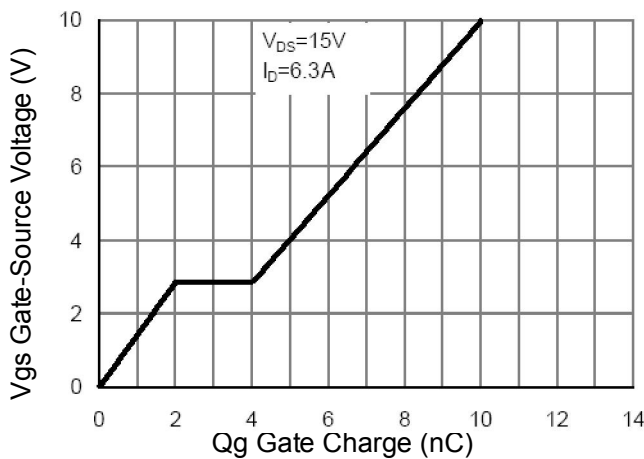


Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

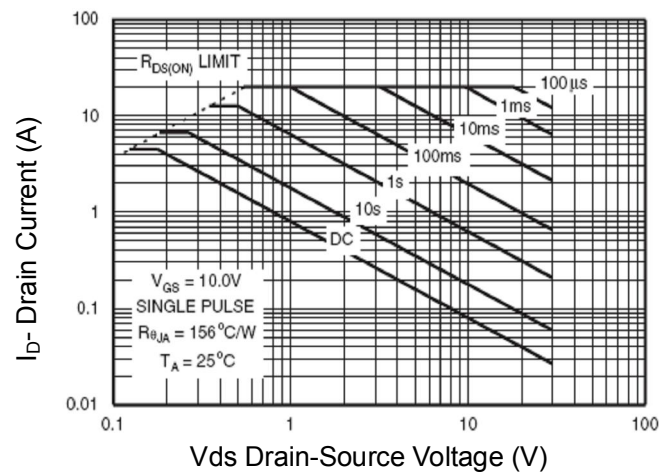


Figure 13 Safe Operation Area

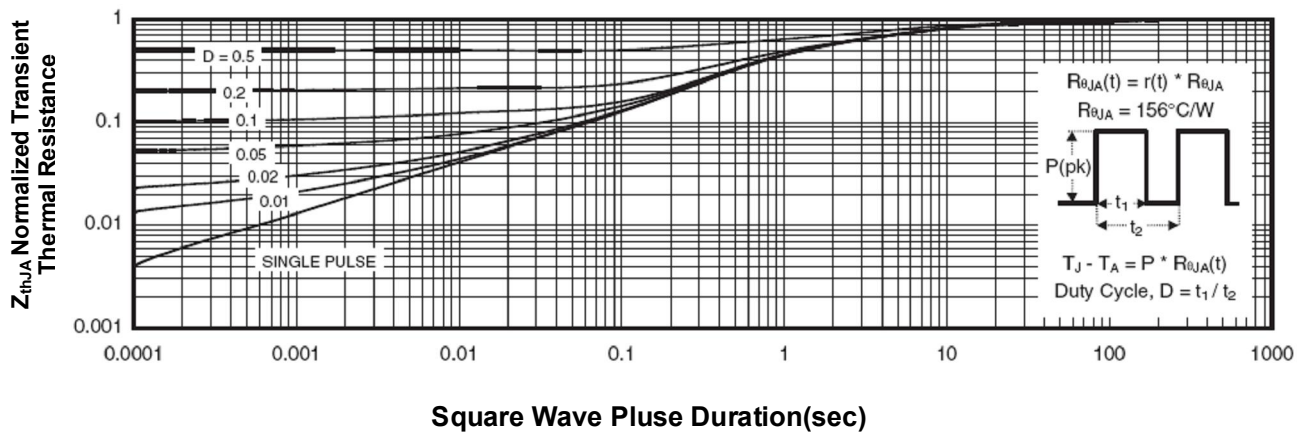
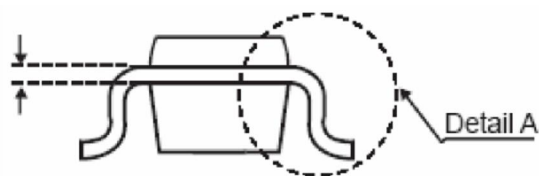
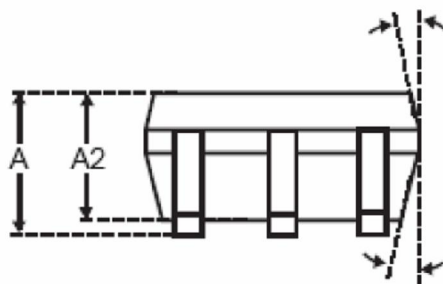
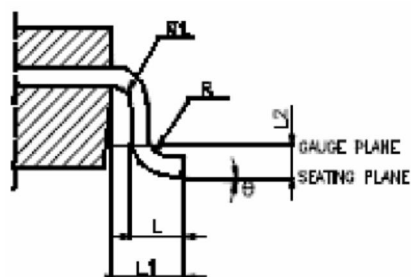
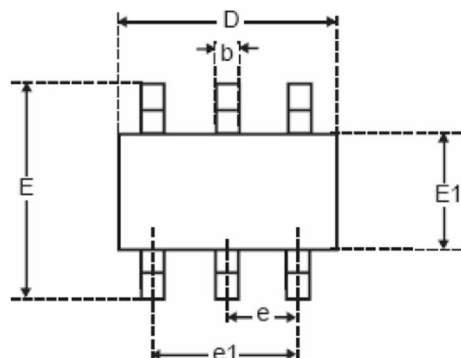


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT23-6 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)



SYMBOLS	MILLIMETERS		
	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.