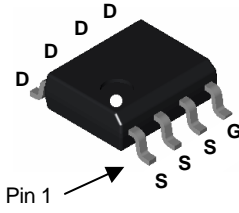
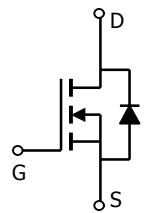



N-Channel Enhancement Mode Power MOSFET

<p>Description</p> <p>The 4420 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge . The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.</p> <p>General Features</p> <table border="1" style="width:100%; border-collapse: collapse; margin: 10px 0;"> <tr> <th colspan="3">PRODUCT SUMMARY</th> </tr> <tr> <th>V_{DSS}</th> <th>I_D</th> <th>$R_{DS(on)}$ (mΩ) Max</th> </tr> <tr> <td rowspan="2">30V</td> <td>12 A</td> <td>10.5 @ $V_{GS} = 10V$</td> </tr> <tr> <td>8 A</td> <td>12.0 @ $V_{GS} = 4.5V$</td> </tr> </table> <ul style="list-style-type: none"> ● High power and current handing capability ● Lead free product is acquired ● Surface mount package 	PRODUCT SUMMARY			V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max	30V	12 A	10.5 @ $V_{GS} = 10V$	8 A	12.0 @ $V_{GS} = 4.5V$	<p>SO-8L</p>  <p>Equivalent Circuit</p>  <p>MARKING</p>  <p>Y :year code W :week code</p>
PRODUCT SUMMARY												
V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max										
30V	12 A	10.5 @ $V_{GS} = 10V$										
	8 A	12.0 @ $V_{GS} = 4.5V$										

Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ^A	$T_A=25^\circ C$	I_D	A
Pulsed Drain Current ^B			
Power Dissipation ^A	$T_A=25^\circ C$	P_D	W
	$T_A=70^\circ C$		
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics					
Parameter	Symbol	Typ	Max	Units	
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	28	40	$^\circ C/W$	
Maximum Junction-to-Ambient ^A					
Maximum Junction-to-Ambient ^A	$R_{\theta JL}$	21	30	$^\circ C/W$	
Maximum Junction-to-Lead ^C					

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} =0V			500	nA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±12V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D = 250μA	0.6	1.1	2.0	V
I _{D(ON)}	On state drain current	V _{GS} = 10V , V _{DS} = 5V			45	A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10V, I _D = 12A		8.3	10.5	mΩ
		V _{GS} = 4.5V, I _D = 8A		9.7	12.0	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 15V, I _D = 12A		9		S
V _{SD}	Diode Forward Voltage	I _S = 3A , V _{GS} =0V		0.76	1.0	V
I _S	Maximum Body-Diode Continuous Current				5	A

DYNAMIC PARAMETERS

C _{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz		3656		pF
C _{OSS}	Output Capacitance			256		pF
C _{RSS}	Reverse Transfer Capacitance			168		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz			1.1	Ω

SWITCHING PARAMETERS

Q _g (10V)	Total Gate Charge (10V)	V _{DD} = 15V, V _{GEN} = 4.5V, I _D = 12A		30.5		nC
Q _g (4.5V)	Total Gate Charge (4.5V)			23		nC
Q _{gs}	Gate Source Charge			4.6		nC
Q _{gd}	Gate Drain Charge			8.6		nC
t _{D(on)}	Turn-On DelayTime	V _{DD} = 15V, V _{GEN} = 10V, R _L = 1.1Ω R _{GEN} =3Ω I _D = 12A		5.5		ns
t _r	Turn-On Rise Time			3.4		ns
t _{D(off)}	Turn-Off DelayTime			49		ns
t _f	Turn-Off Fall Time			5.9		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F = 10A, di/dt=100A/μs		22		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F = 10A, di/dt=100A/μs		12.5		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t_s 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D: The static characteristics in Figures 1 to 6,12,14 are obtained using 80μs pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

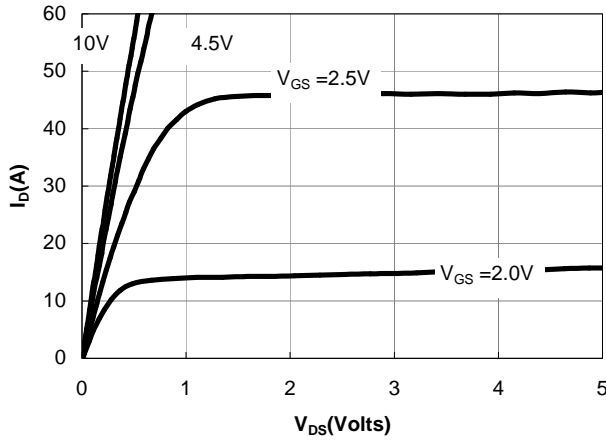


Figure 1: On-Regions Characteristics

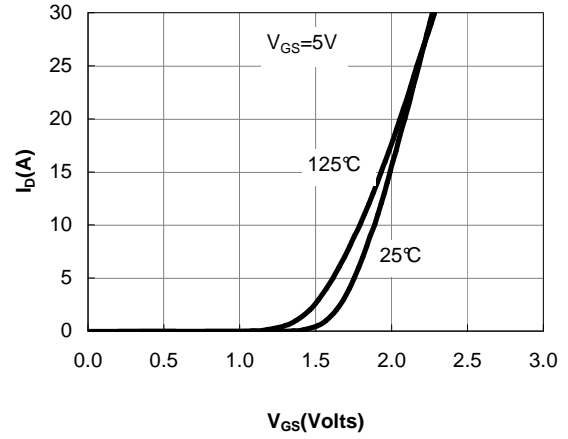


Figure 2: Transfer Characteristics

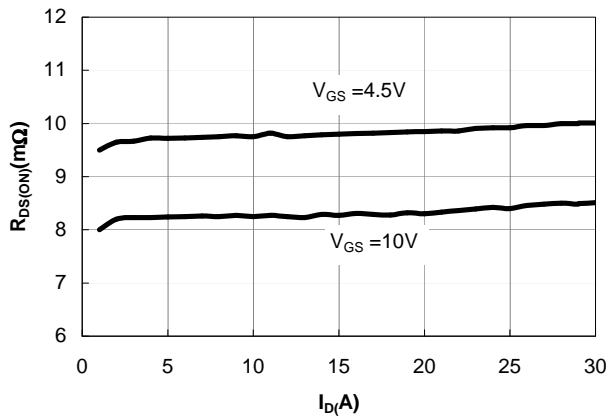


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

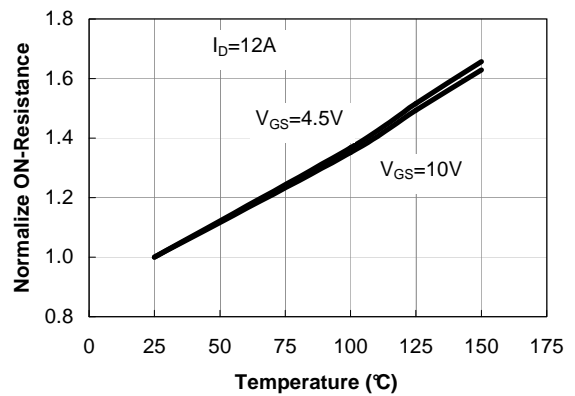


Figure 4: On-Resistance vs. Junction

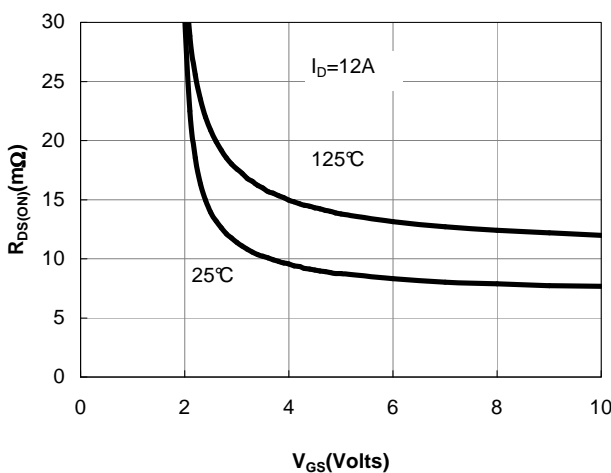


Figure 5: On-Resistance vs. Gate-Source Voltage

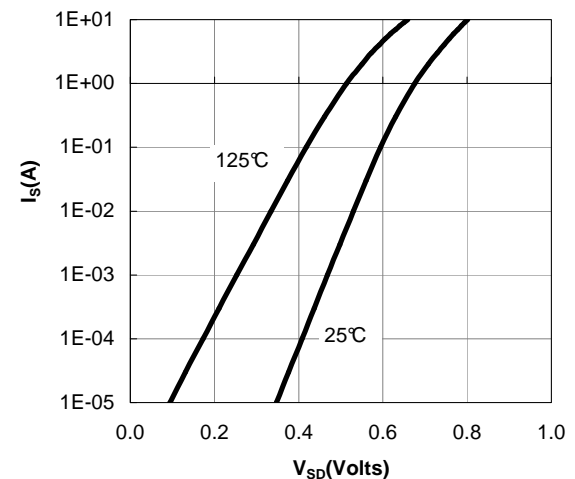


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

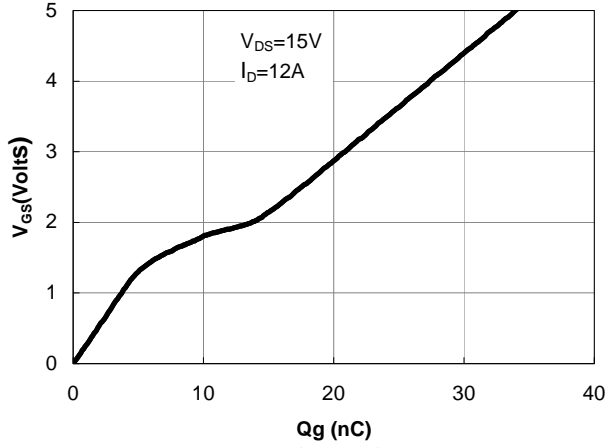


Figure 7: Gate-Charge Characteristics

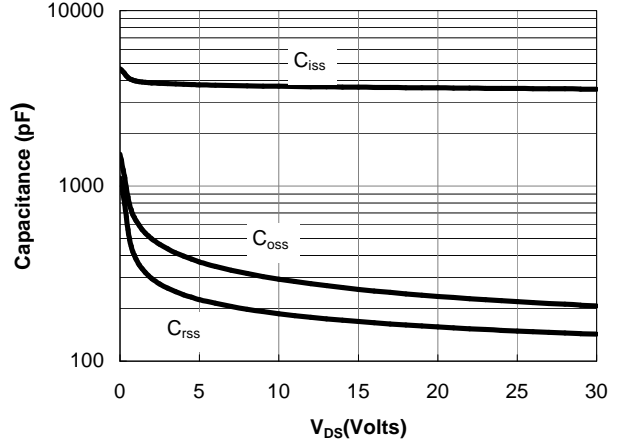


Figure 8: Capacitance Characteristics

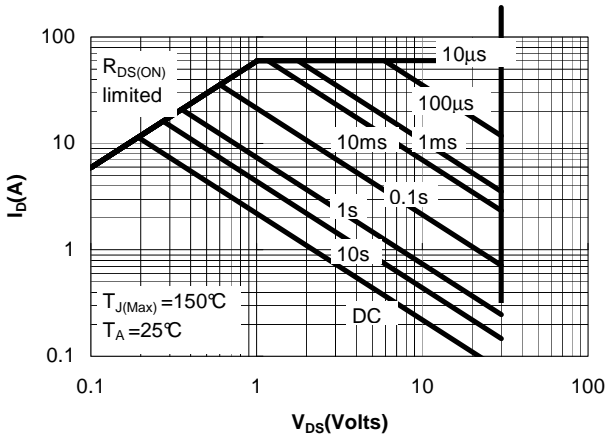


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

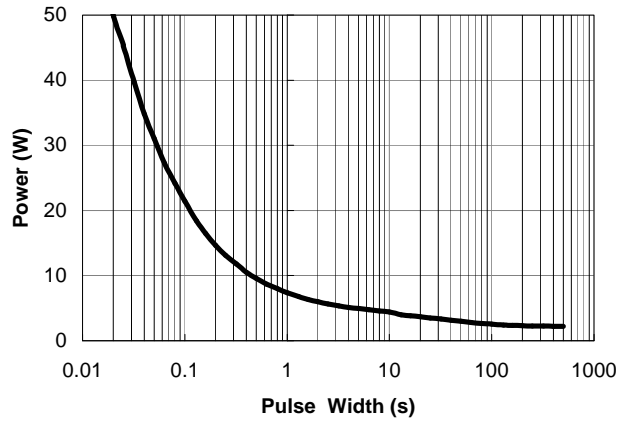


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

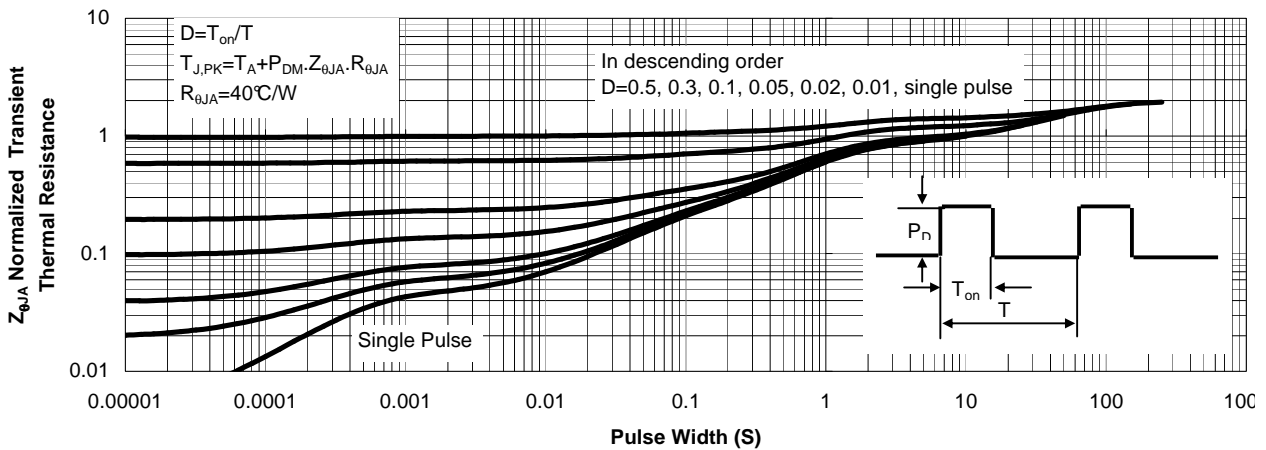
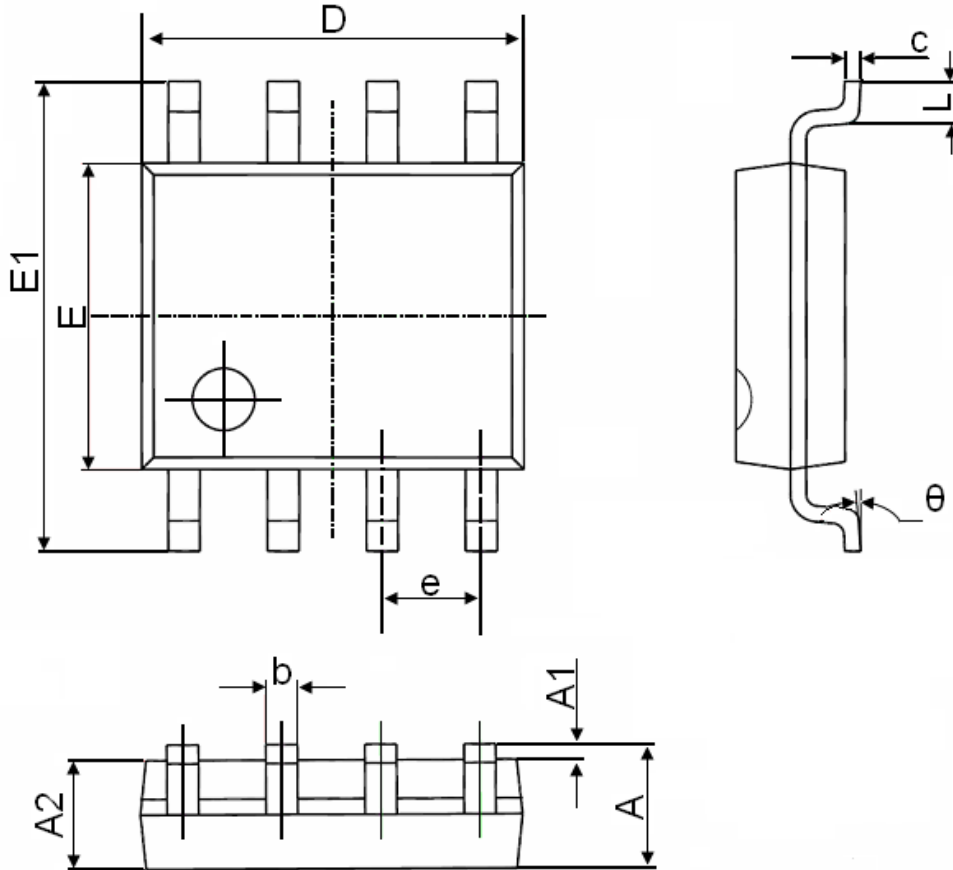


Figure 11: Normalized Maximum Transient Thermal Impedence

SOP-8 Plastic-Encapsulate MOSFETS

4420

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°