



SOT-23 Plastic-Encapsulate MOSFETS

MK3420

N-Channel 20-V(D-S) MOSFET

V(BR)DSS	RDS(on)MAX	ID
20 V	24mΩ@10V	6A
	27mΩ@4.5V	
	42mΩ@2.5V	

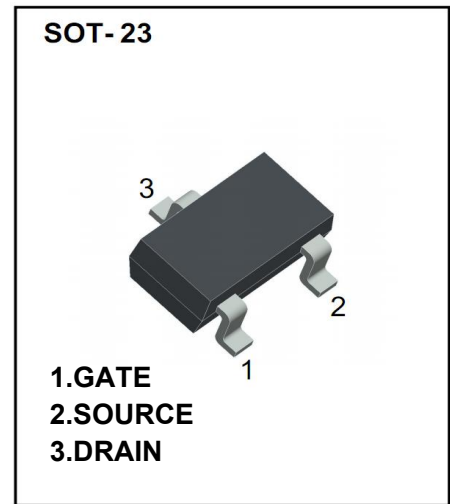
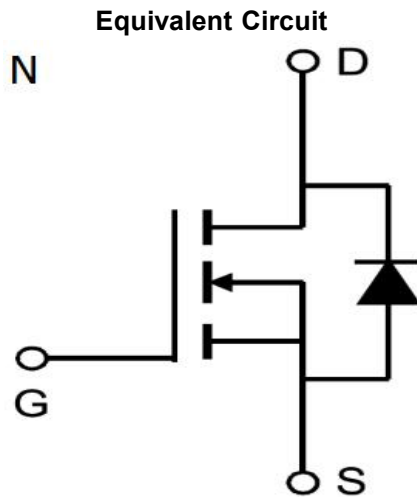
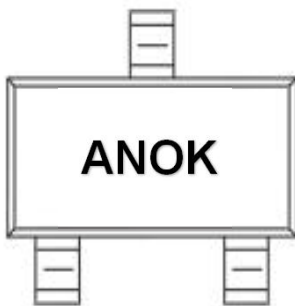
General Description

The MK3420 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 1.8V while retaining a 12V VGS(MAX)rating. This device is suitable for use as a uni-directional or bi-directional load switch.

APPLICATION

- ※ Load Switch for Portable Devices
- ※ DC/DC Converter

MARKING



Maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	20	V
Gate-Source Voltage	VGS	±12	
Continuous Drain Current	ID	6	A
Pulsed Diode Current	IDM	30	
Continuous Source-Drain Current(Diode Conduction)	IS	2	
Power Dissipation	PD	1.4	W
Thermal Resistance from Junction to Ambient (t≤5s)	RθJA	125	°C/W
Operating Junction	TJ	150	°C
Storage Temperature	TSTG	-55~+150	°C



MOSFET ELECTRICAL CHARACTERISTICS

Static Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)

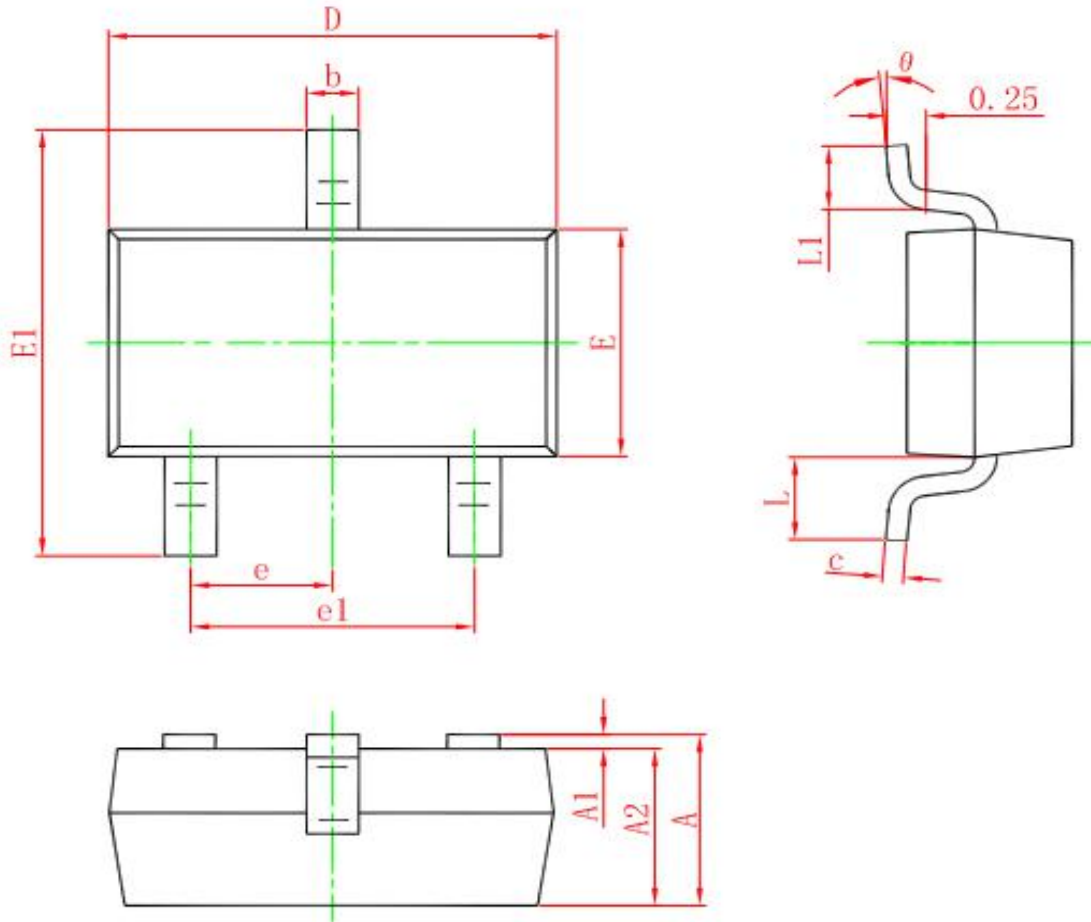
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	V(BR)DSS	VGS = 0V, ID = 250μA	20			V
Gate-source threshold voltage	VGS(th)	VDS = VGS, ID = 250μA	0.4		1.1	V
Gate-source leakage	IGSS	VDS = 0V, VGS = ±12V			±100	nA
Zero gate voltage drain current	IDSS	VDS = 30V, VGS = 0V			1	μA
Drain-source on-state resistancea	RDS(on)	VGS = 10V, ID = 6A		18	24	mΩ
		VGS = 4.5V, ID = 5A		20	27	mΩ
		VGS = 2.5V, ID = 4A		25	42	mΩ
Forward transconductancea	gfs	VDS = 4.5V, ID = 6A		25		S
Diode forward voltage	VSD	IS=1A,VGS=0V		0.72	1.1	V
Dynamic						
Input capacitance	Ciss	VDS = 10V,VGS = 0V, f=1MHz		525		pF
Output capacitance	Coss			95		pF
Reverse transfer capacitanceb	Crss			75		pF
Total gate charge	Qg	VDS = 10V,VGS = 10V, ID = 6A		12.5	12	nC
Gate-source charge	Qgs			1.1		nC
Gate-drain charge	Qgd			2		nC
Gate resistance	Rg	f=1MHz		1.7		Ω
Switchingb						
Turn-on delay time	td(on)	VDD= 10V RL=1.7Ω, ID = 3A, VGEN= 10V,Rg=3Ω		3		ns
Rise time	tr			7.5		ns
Turn-off delay time	td(off)			20		ns
Fall time	tf			6		ns
Drain-source body diode characteristics						
Continuous Source-Drain Diode Current	IS	Tc=25°C			2	A
Pulsed Diode forward Current	ISM				20	A

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

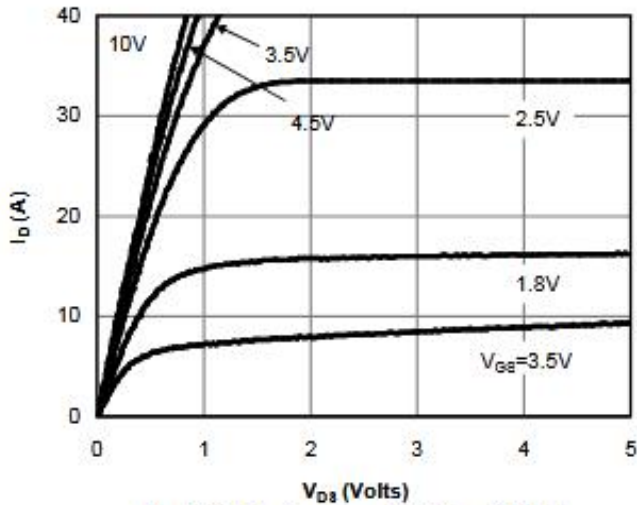


Fig 1: On-Region Characteristics (Note E)

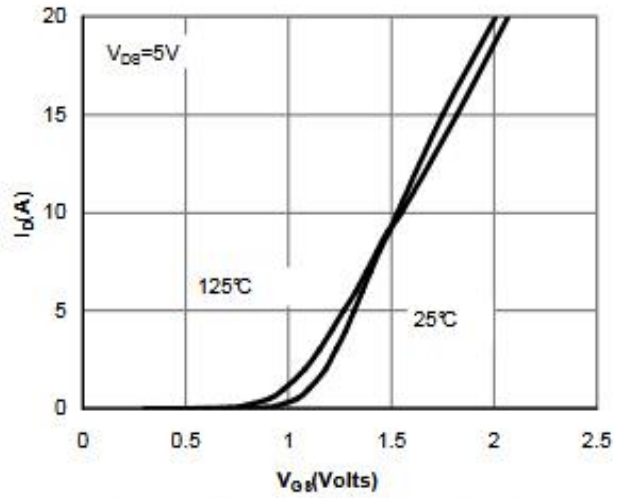


Figure 2: Transfer Characteristics (Note E)

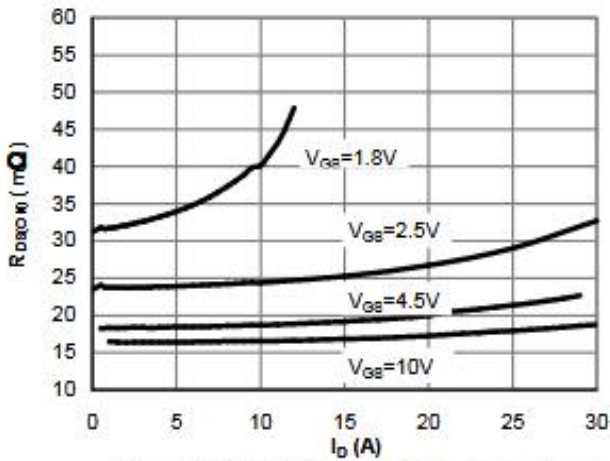


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

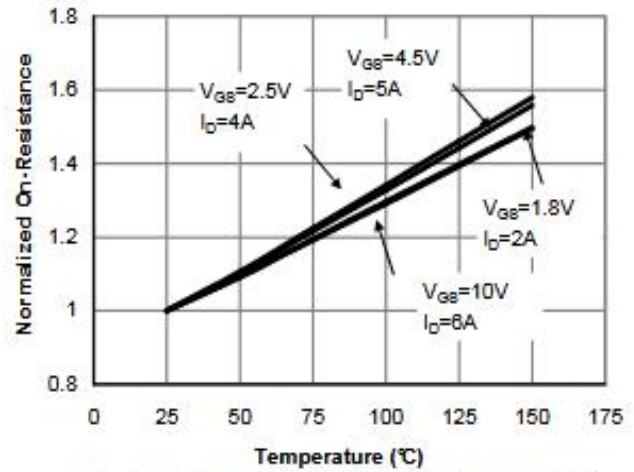


Figure 4: On-Resistance vs. Junction Temperature (Note E)

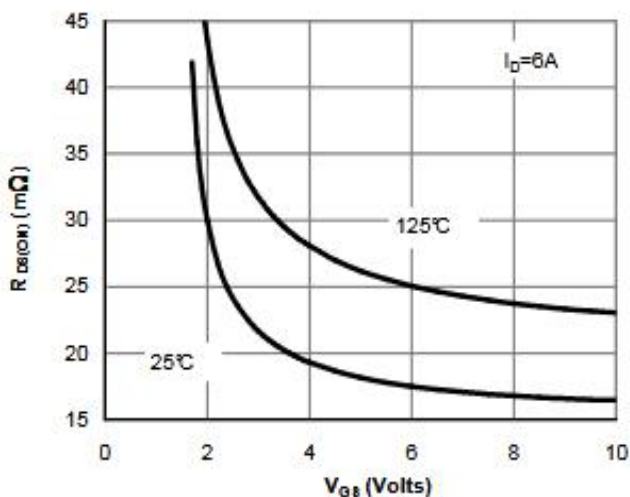


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

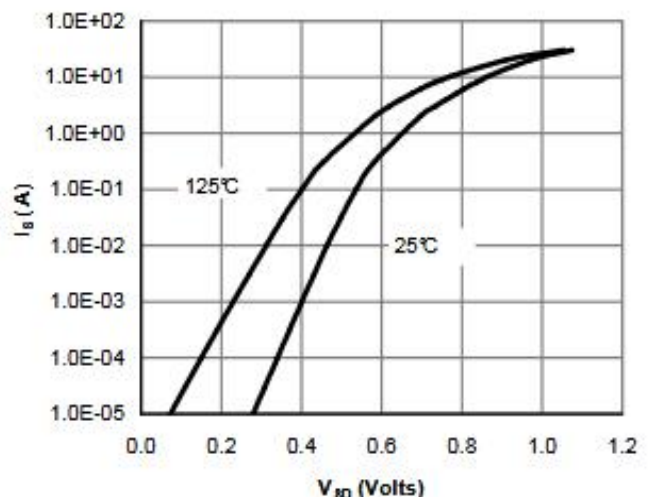


Figure 6: Body-Diode Characteristics (Note E)



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

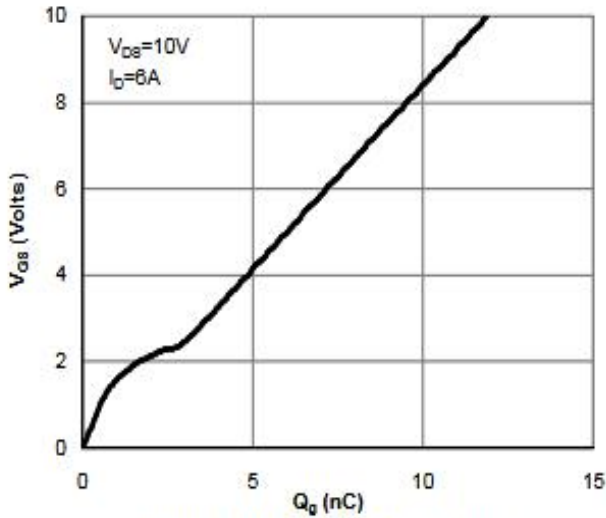


Figure 7: Gate-Charge Characteristics

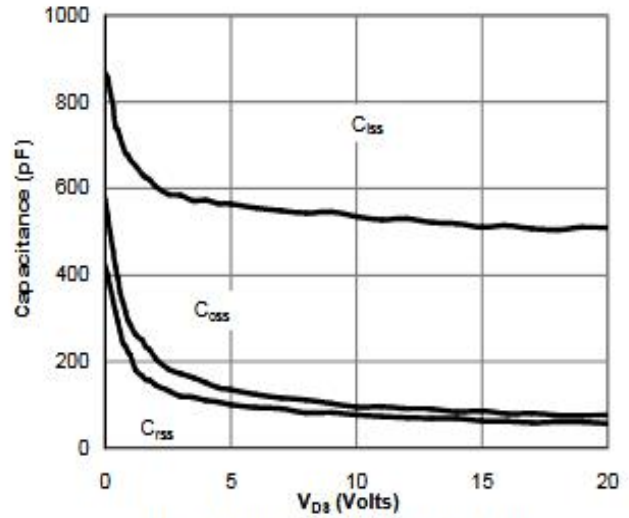


Figure 8: Capacitance Characteristics

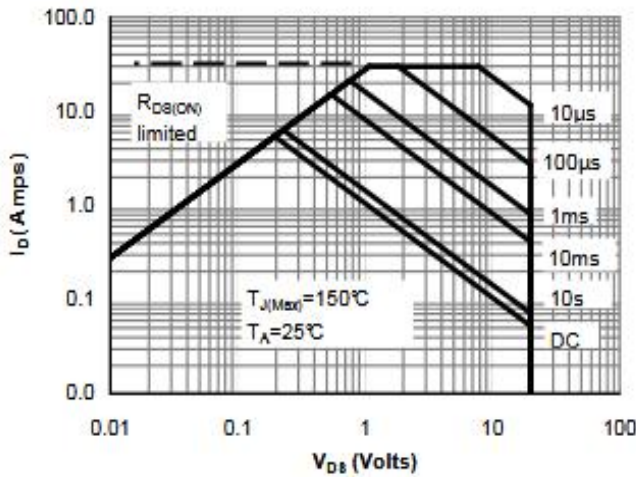


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

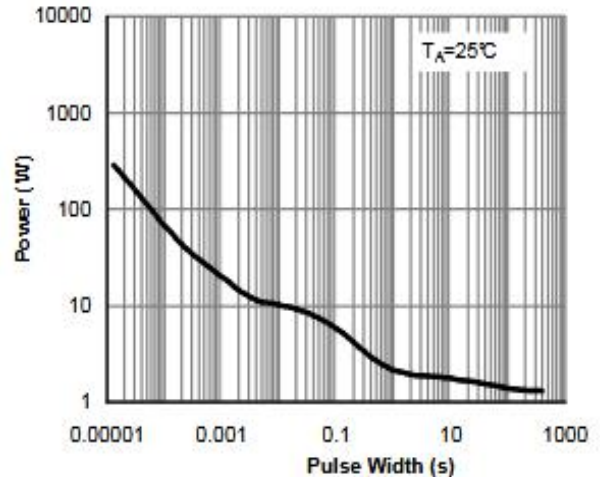


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

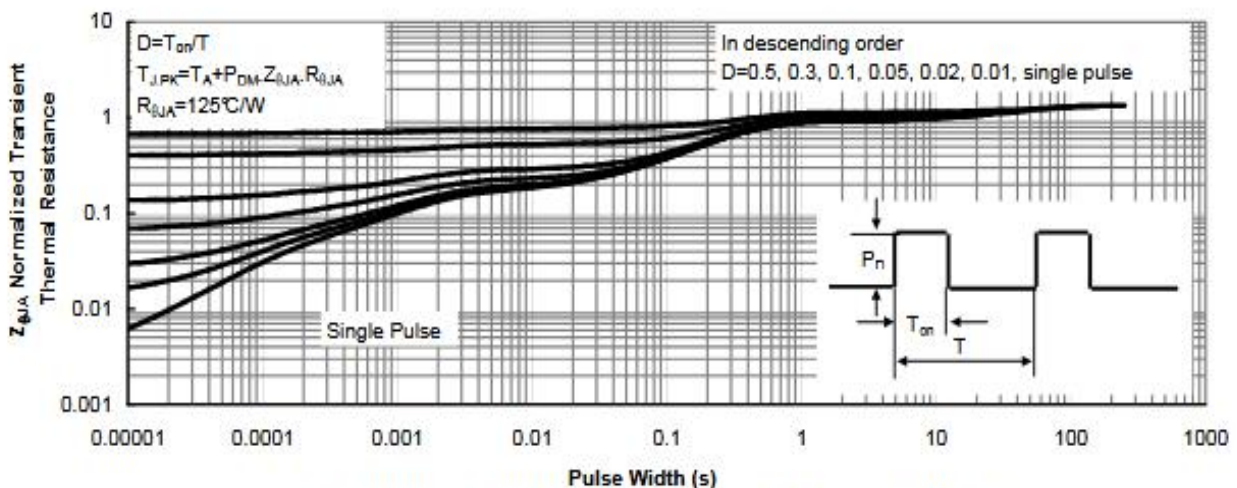


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)