



SOT-23-6L Plastic-Encapsulate MOSFETS

MK6404

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

V(BR)DSS	RDS(on)MAX	ID
20 V	20mΩ@4.5V	8.6A
	25mΩ@2.5V	
	35mΩ@1.8V	

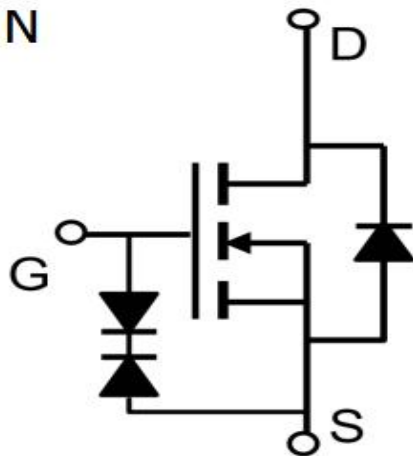
FEATURE:

- TrenchFET Power MOSFET
- **ESD Rating: 2000V HBM**

MARKING:



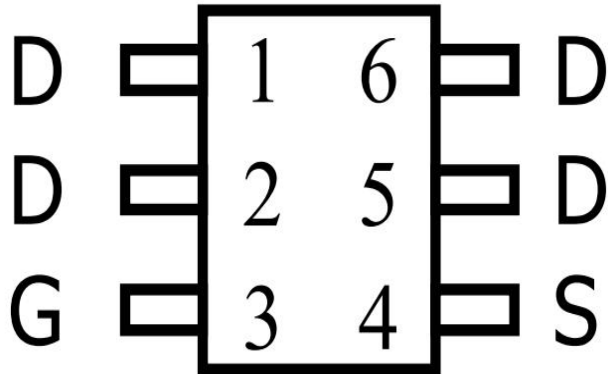
Equivalent Circuit :



General Description :

The MK6404 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. It is ESD protected. Standard Product MK6404 is Pb-free (meets ROHS & Sony 259 specifications).

SOT-23-6L



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	8.6	A
Pulsed Diode Current	IDM	30	
Continuous Source-Drain Current(Diode Conduction)	IS	3	
Power Dissipation	PD	2	W
Thermal Resistance from Junction to Ambient (t≤10s)	RθJA	110	°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)

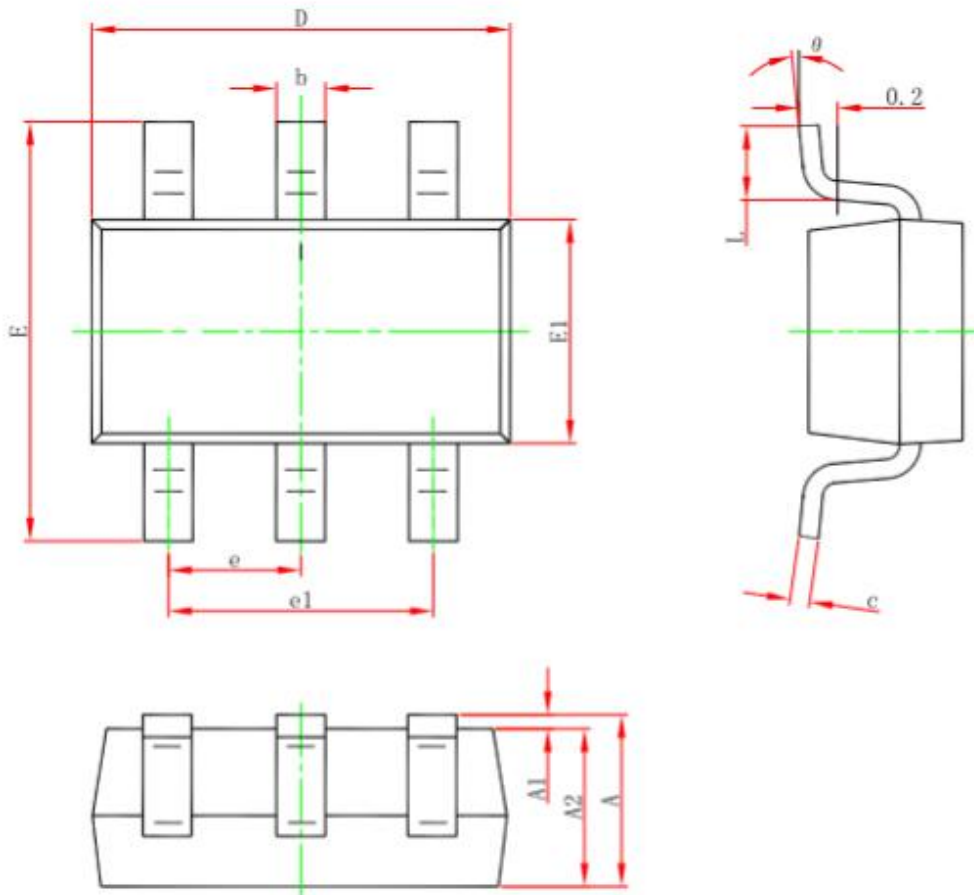
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	V(BR)DSS	VGS = 0V, ID = 250μA	20			V
Gate-source threshold voltage	VGS(th)	VDS = VGS, ID = 250μA	0.5		1	V
Gate-body leakage current	IGSS	VDS = 0V, VGS = ±8V			±10	μA
Zero gate voltage drain current	IDSS	VDS = 16V, VGS = 0V			10	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = 4.5V, ID = 5A		14.8	20	mΩ
		VGS = 2.5V, ID = 4A		18	25	mΩ
		VGS = 1.8V, ID = 3A		22	35	mΩ
Forward transconductance	gfs	VDS = 5V, ID = 8A		36		S
Diode forward voltage	VSD	IS = 1A, VGS = 0V	0.5	0.8	1	V
Maximum Body-Diode Continuous Current	IS				3	A
Dynamic						
Input capacitance	Ciss	VDS = 10V, VGS = 0V, f = 1MHz		1810		pF
Output capacitance	Coss			232		pF
Reverse transfer capacitance	Crss			200		pF
Total gate charge	Qg	VDS = 10V, VGS = 4.5V, ID = 8.5A		17.9		nC
Gate-source charge	Qgs			1.5		nC
Gate-drain charge	Qgd			4.7		nC
Gate resistance	Rg	f = 1MHz		1.3		Ω
Switching						
Turn-on delay time	td(on)	VDS = 10V RL = 1.2Ω, ID = 8.5A, VGS = 10V, Rg = 3Ω		2.5		ns
Rise time	tr			7.2		ns
Turn-off delay time	td(off)			49		ns
Fall time	tf			10.8		ns
Body Diode Reverse Recovery Time	Trr	IF = 8.5A, dI/dt = 100A/μs		22		ns
Body Diode Reverse Recovery Charge	Qrr	IF = 8.5A, dI/dt = 100A/μs		9.8		nC

Note :

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



SOT-23-6L PACKAGE OUTLINE DIMENSIONS:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



Typical Electrical Thermal Characteristics:

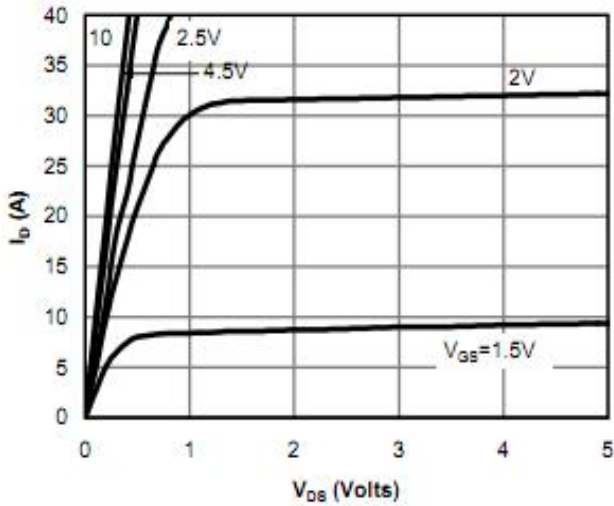


Fig 1: On-Region Characteristics

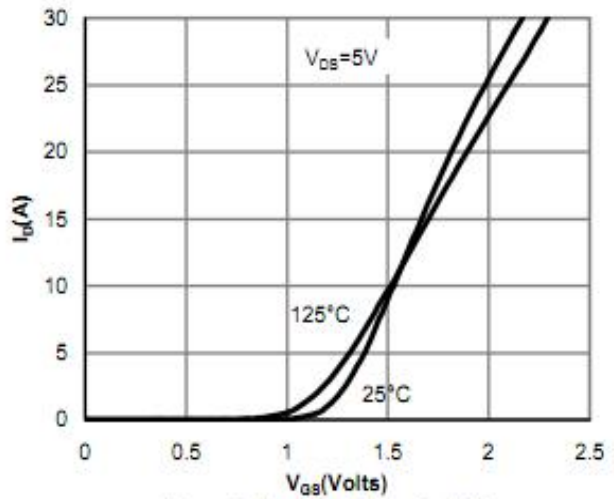


Figure 2: Transfer Characteristics

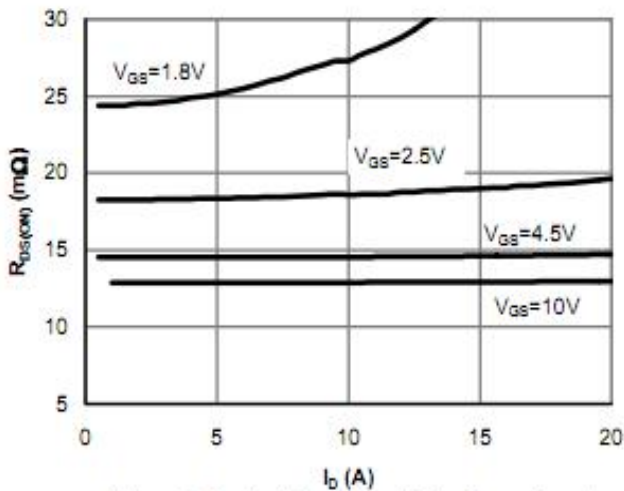


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

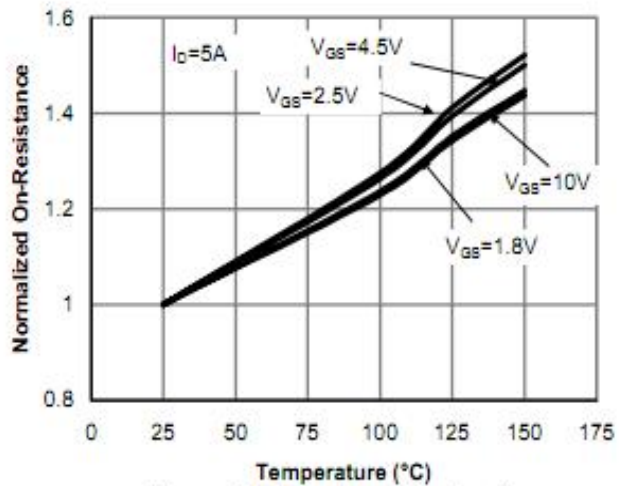


Figure 4: On-Resistance vs. Junction Temperature

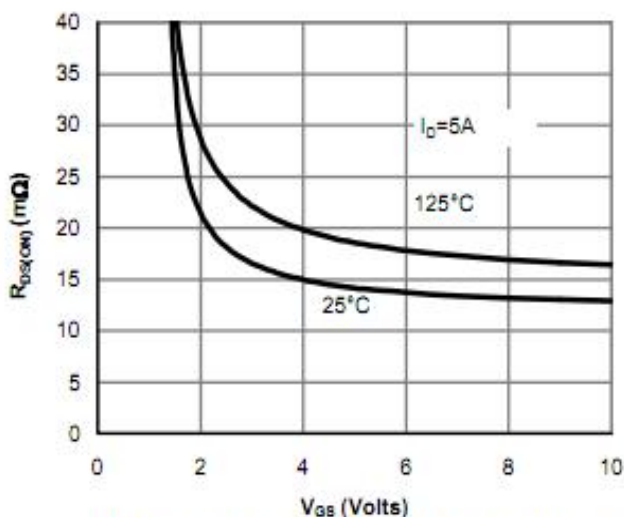


Figure 5: On-Resistance vs. Gate-Source Voltage

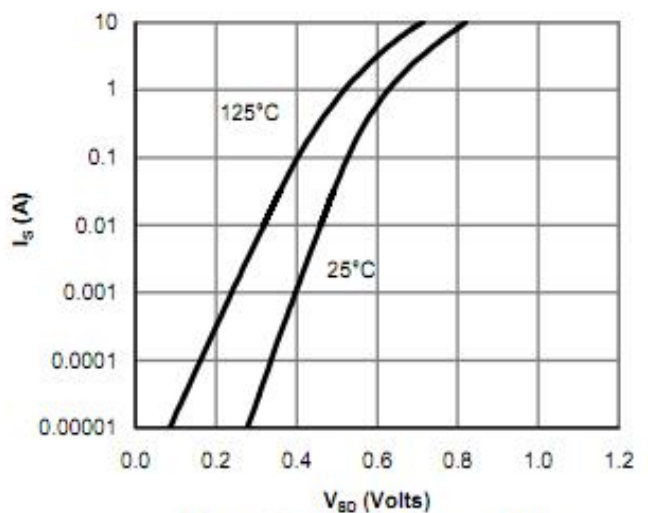


Figure 6: Body-Diode Characteristics



Typical Electrical Thermal Characteristics:

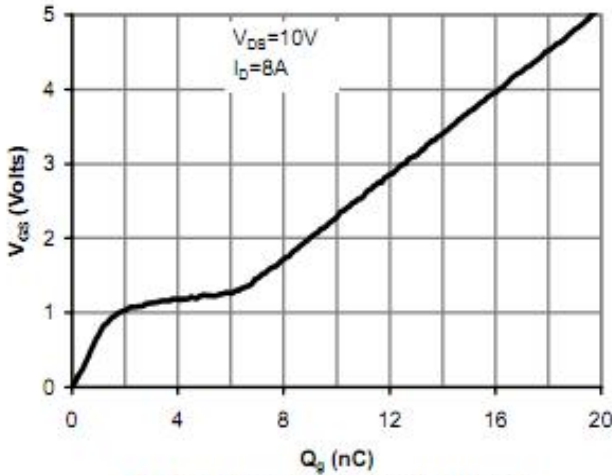


Figure 7: Gate-Charge Characteristics

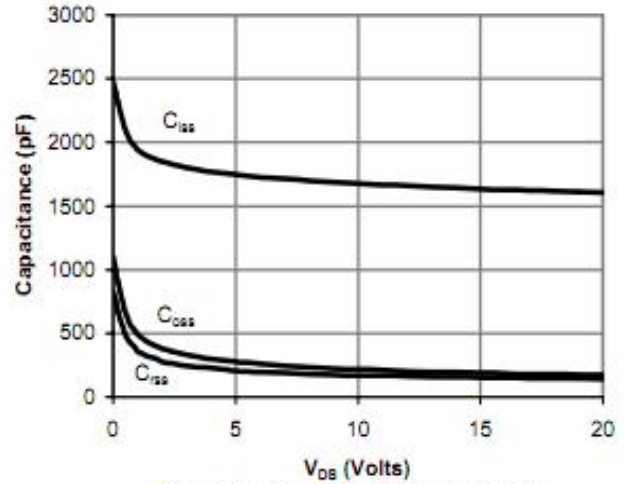


Figure 8: Capacitance Characteristics

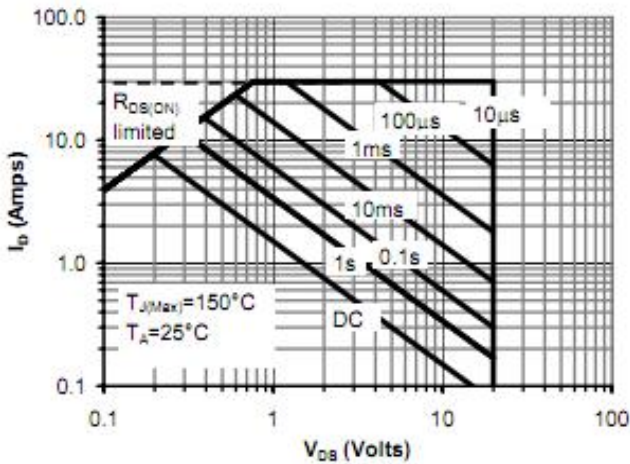


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

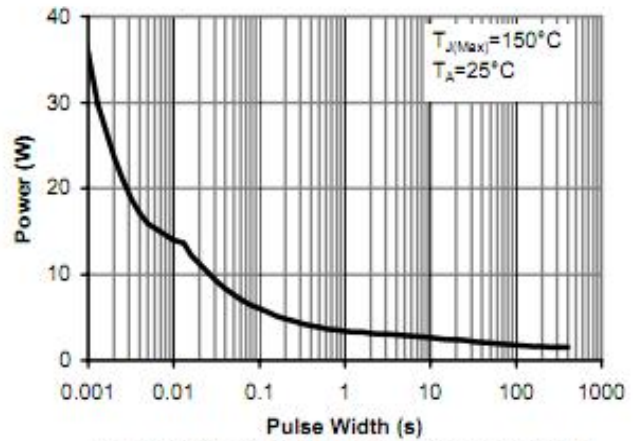


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

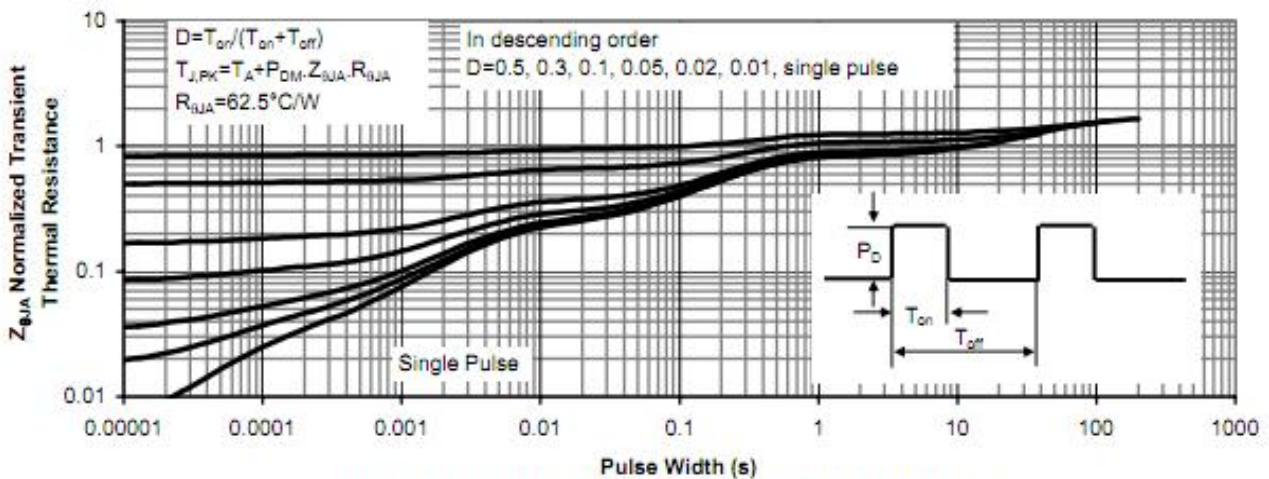


Figure 11: Normalized Maximum Transient Thermal Impedance