

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
50V	1.5Ω@10V	0.31A
	2.5Ω@4.5V	
	2.9Ω@2.5V	
	4.0Ω@1.8V	

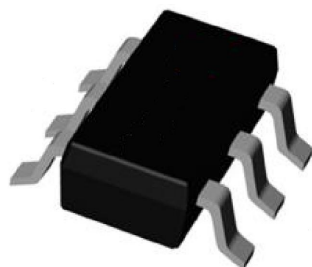
Feature

- Low on-resistance
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy

Application

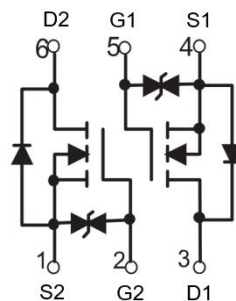
- N-channel enhancement mode effect transistor
- Switching application

Package

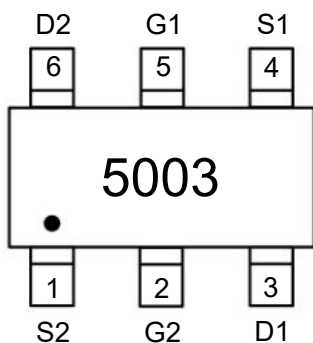


SOT-23-6L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾	I_D	0.31	A
Pulsed Drain Current ($t_p=10\mu\text{s}$)	I_{DM}	2	A
Power Dissipation ¹⁾	P_D	0.4	W
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	310	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	50			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =50V,V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.8	1.0	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =0.5A		1.1	1.5	Ω
		V _{GS} =4.5V, I _D =0.2A		1.2	2.5	
		V _{GS} =2.5V, I _D =0.2A		1.6	2.9	
		V _{GS} =1.8V, I _D =0.05A		2.8	4.0	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f=1MHz		44		pF
Output Capacitance	C _{oss}			10		
Reverse Transfer Capacitance	C _{rss}			7		
Total Gate Charge	Q _g	V _{DD} =25V,V _{GS} =10V,I _D =0.2A		4.3		nC
Gate-Source Charge	Q _{gs}			0.7		
Gate-Drain Charge	Q _{gd}			0.5		
Turn-on delay time	t _{d(on)}	V _{DD} =30V,V _{GS} =10V,I _D =0.2A R _G =25Ω,R _L =150Ω		6		nS
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			25		
Turn-off fall time	t _f			15		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				0.31	A
Diode Forward Voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =0.3A			1.2	V

Notes:

- 1) The data tested by surface mounted on a FR-4 board.
- 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

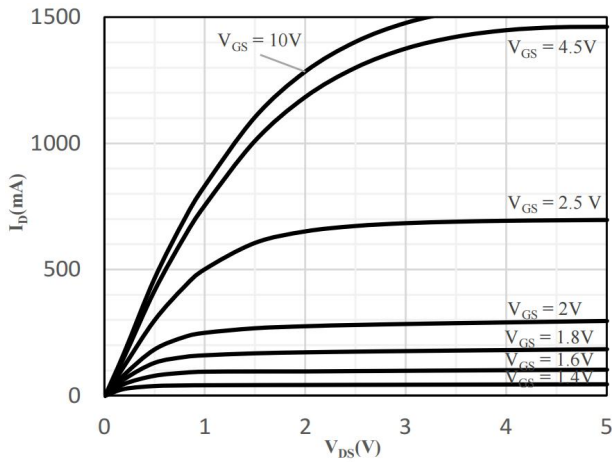


Fig 1 Typical Output Characteristics

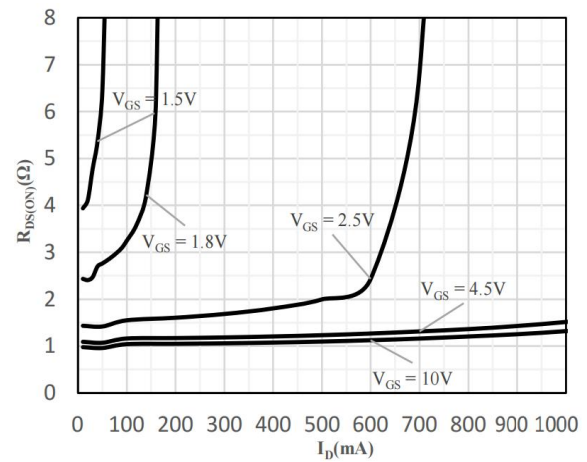


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

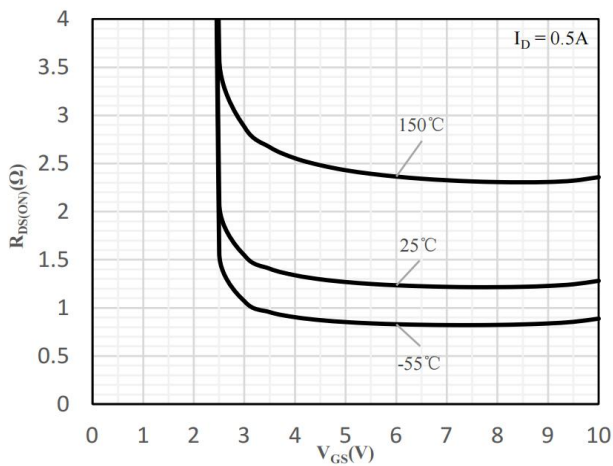


Fig 3 On-Resistance vs. Gate-Source Voltage

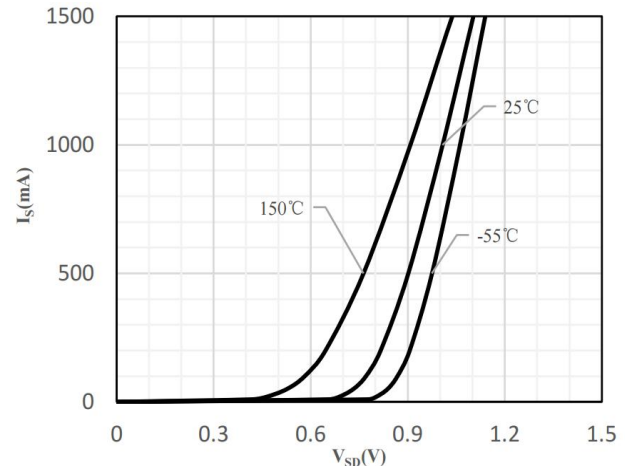


Fig 4 Body-Diode Characteristics

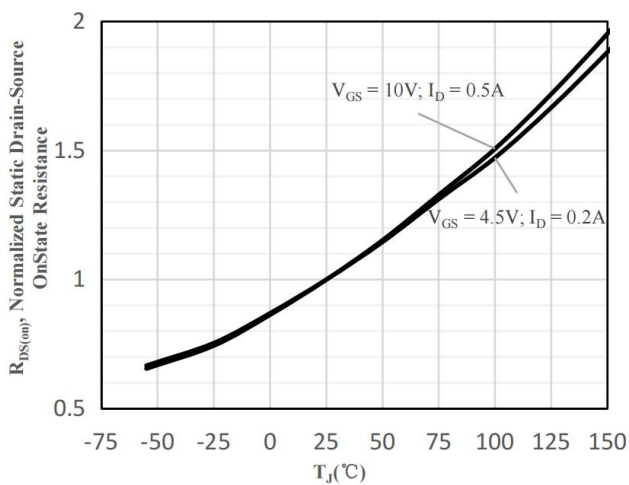


Fig 5 Normalized On-Resistance vs. Junction Temperature

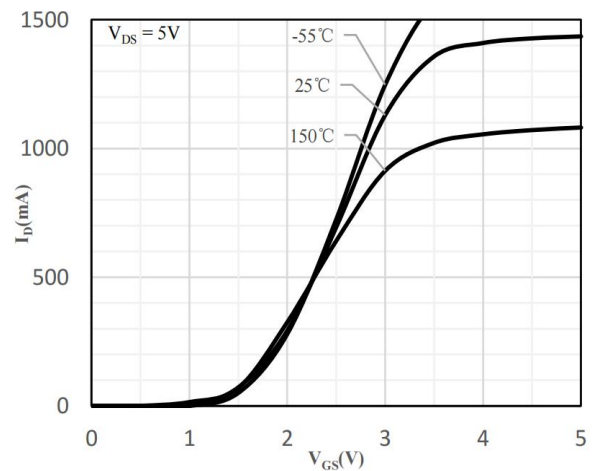


Fig 6 Transfer Characteristics

Typical Characteristics

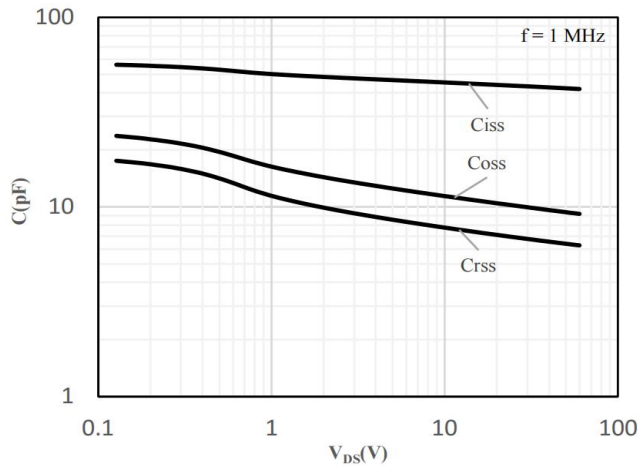


Fig 7 Capacitance Characteristics

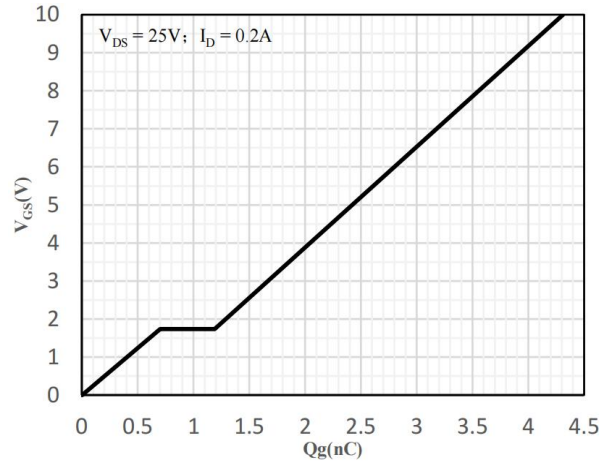


Fig 8 Gate-Charge Characteristics

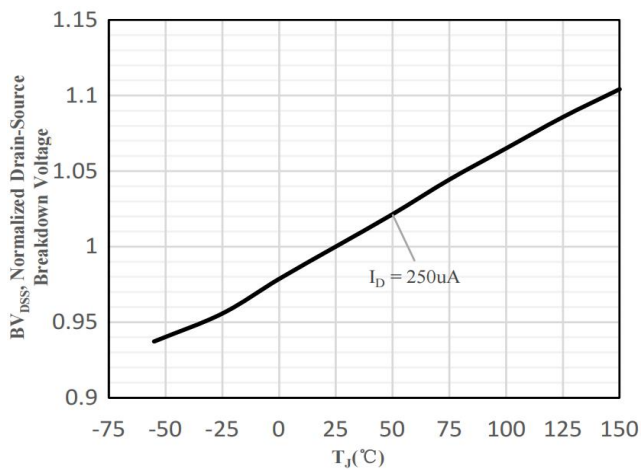


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

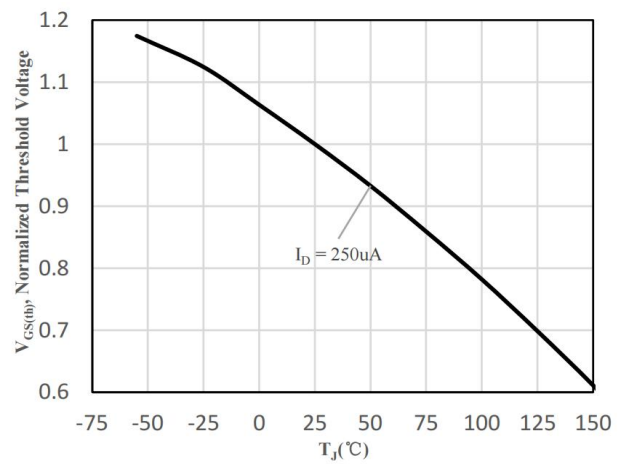


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

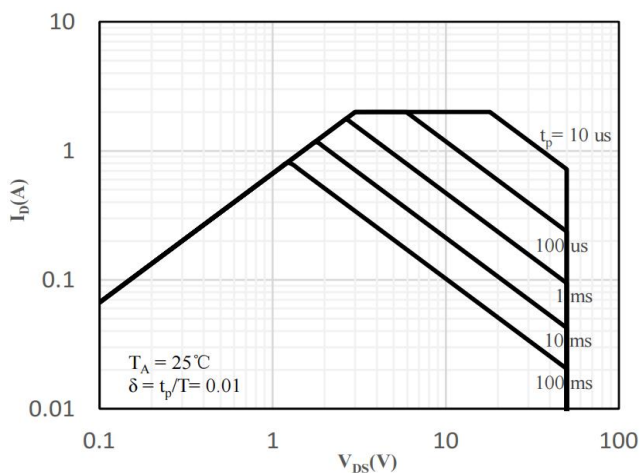


Fig 11 Safe Operation Area

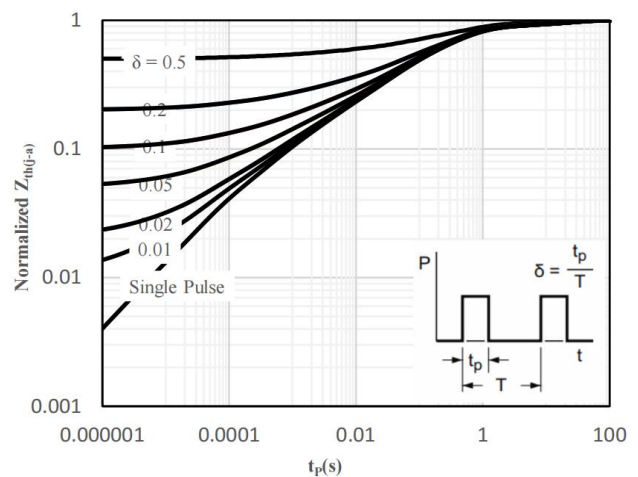
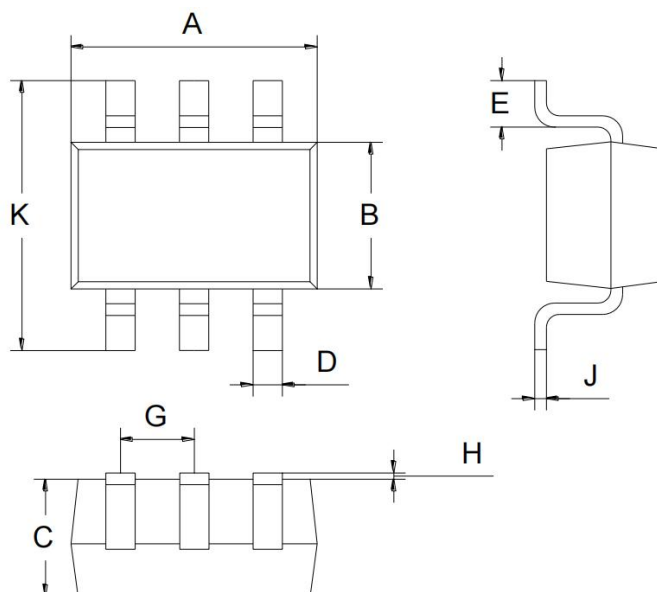


Fig 12 Normalized Maximum transient thermal impedance

SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.800	3.000	0.110	0.118
B	1.500	1.700	0.059	0.067
C	1.000	1.200	0.039	0.047
D	0.350	0.450	0.014	0.018
E	0.350	0.550	0.014	0.022
G	0.900	1.000	0.035	0.039
H	0.020	0.100	0.001	0.004
J	0.100	0.200	0.004	0.008
K	2.600	3.000	0.102	0.118