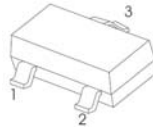


FEATURE

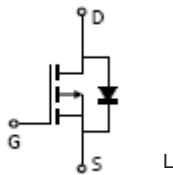
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

SOT-23

1. GATE
2. SOURCE
3. DRAIN

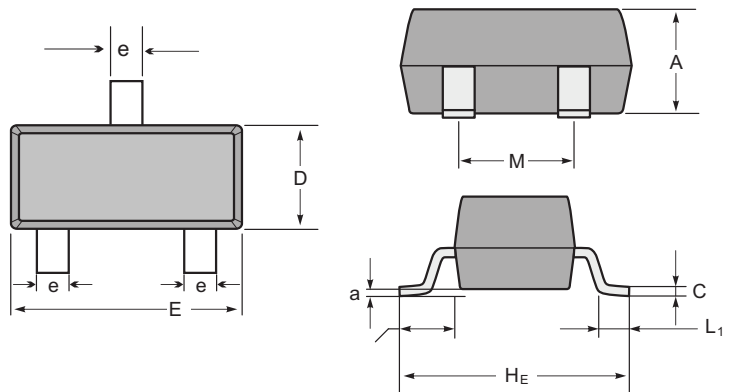


Equivalent Circuit



Marking

Type number	Marking code
6402	E***



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current $V_{GS}=4.5V @ T_A=25^\circ\text{C}$	I_D	-3.7	A
Continuous Drain Current $V_{GS}=4.5V @ T_A=70^\circ\text{C}$		-2.2	
Pulsed Drain Current a	I_{DM}	-30	
Power Dissipation @ $T_A=25^\circ\text{C}$	P_D	1.3	W
Power Dissipation @ $T_A=70^\circ\text{C}$		0.8	
Single Pulse Avalanche Energy b	E_{AS}	11	mJ
Thermal Resistance Junction- to-Ambient	R_{thJA}	100	$^\circ\text{C}/\text{W}$
Linear Derating Factor		0.01	$\text{W}/^\circ\text{C}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Junction and Storage Temperature Range	T_{stg}	-55 to 150	

Notes:

a. Repetitive Rating :Pulse width limited by maximum junction temperature

b. Starting $T_J=25^\circ\text{C}$, $L=1.65\text{mH}$, $R_G=25\Omega$, $I_{AS}=-3.7\text{A}$

6402

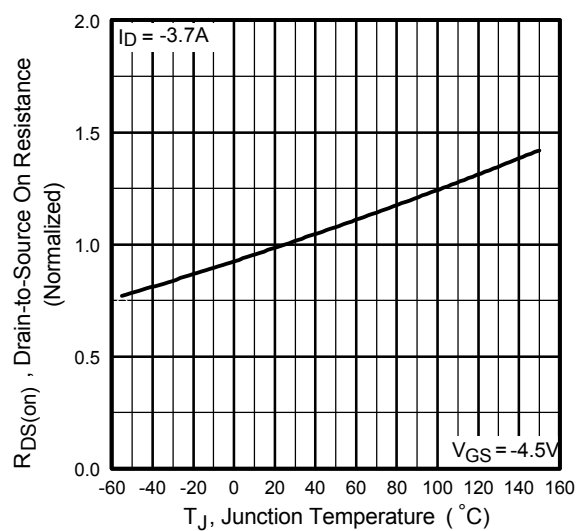
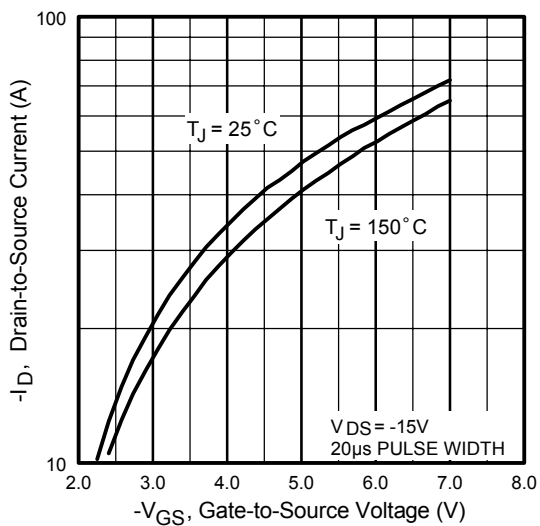
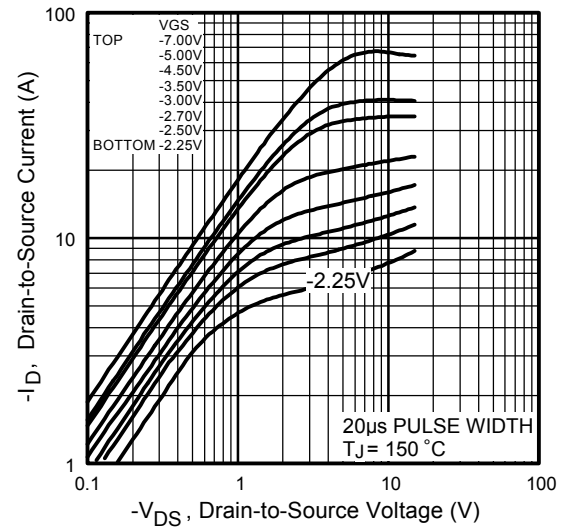
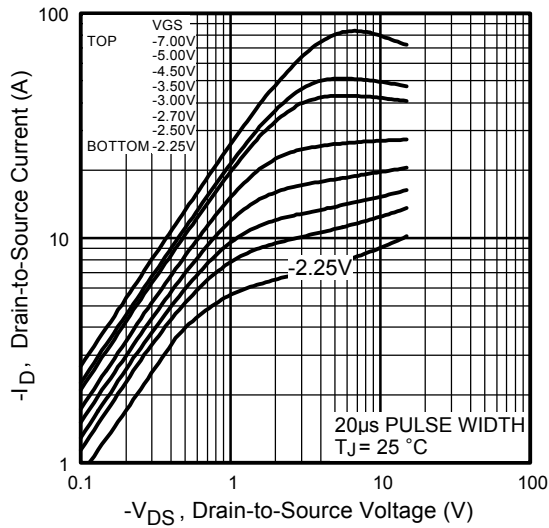
■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source Breakdown voltage	V _{DSS}	I _D = -250 μA, V _{GS} = 0V	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0V			-1.0	μA
		V _{DS} = -20 V, V _{GS} = 0V, T _J = 70°C			-25	
Gate-source leadage	I _{GSS}	V _{GS} = ±12V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-0.40	-0.55	-0.95	V
Static drain-source on- resistance	R _{DS(on)}	I _D = -3.7A, V _{GS} = -4.5V		0.050	0.065	Ω
		I _D = -3.1A, V _{GS} = -2.5V		0.080	0.135	
Forward Transconductance	g _{fs}	V _{DS} = -10 V, I _D = -3.7 A	6.0			S
Input capacitance	C _{iss}	V _{DS} = -10 V,		633		pF
Output capacitance	C _{oss}	V _{GS} = 0 V,		145		
Reverse transfer capacitance	C _{rss}	f = 1MHz		110		
Total Gate Charge	Q _g	V _{DS} = -10V, V _{GS} = -5.0 V, I _D = -3.7 A		8.0	12	nC
Gate-Source Charge	Q _{gs}			1.2	1.8	
Gate-Drain Charge	Q _{gd}			2.8	4.2	
Turn-on delay time	t _{d(on)}	I _D = -3.7 A,		350		ns
Rise time	t _r	V _{DD} = -10 V,		48		
Turn-off delay time	t _{d(off)}	R _D = 2.7 Ω		588		
Fall time	t _f	R _G = 89 Ω		381		
Reverse recovery time	t _{rr}	T _J = 25°C, I _F = -1.0 A,		29	43	ns
Reverse recovery charge	Q _{rr}	di / dt = -100 A / μs *2		11	17	nC
Continuous source current	I _S	MOSFET symbol showing the integral reverse p-n junction diode			-1.3	A
Pulsed source current *1	I _{SM}				-22	
Diode forward voltage	V _{SD}	T _J = 25°C, V _{GS} = 0 V, I _S = -1.0 A *2			-1.2	V

*1 Repetitive rating; pulse width limited by max. junction temperature.

* 2 Pulse width ≤ 400 μs, Duty cycle ≤ 2%

RATING AND CHARACTERISTIC CURVES (6402)



RATING AND CHARACTERISTIC CURVES (6402)

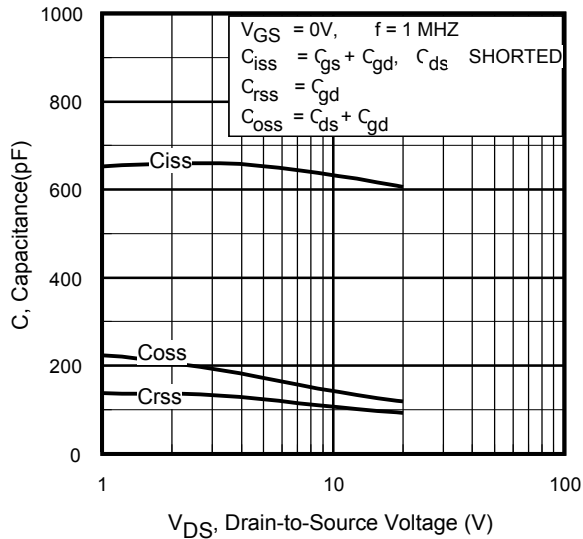


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

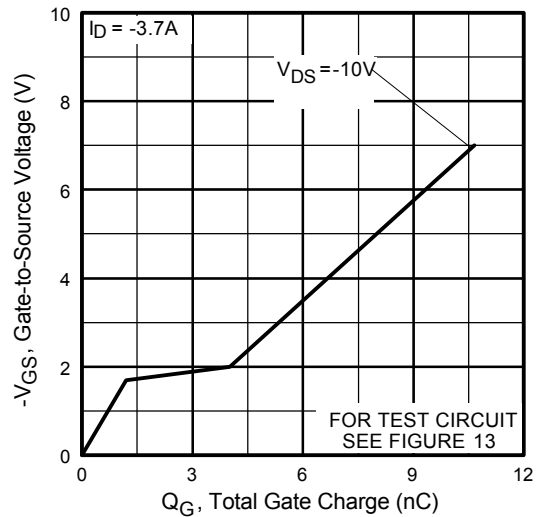


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

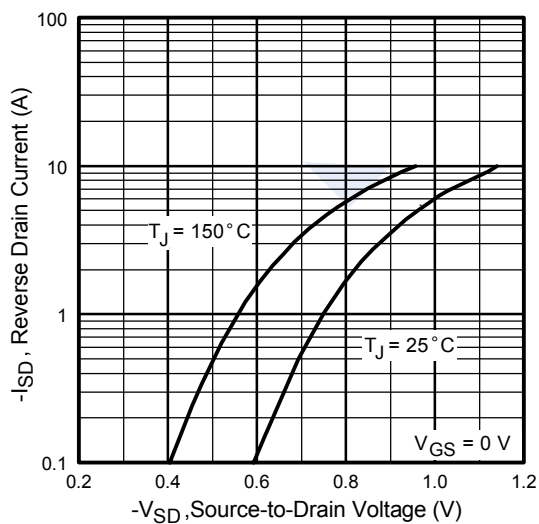


Fig 7. Typical Source-Drain Diode Forward Voltage

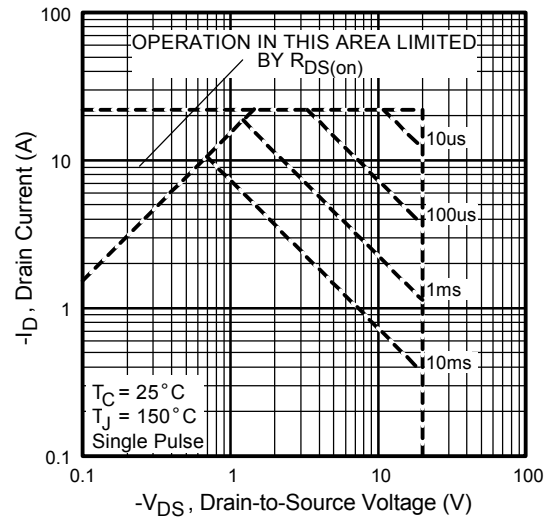


Fig 8. Maximum Safe Operating Area

RATING AND CHARACTERISTIC CURVES (6402)

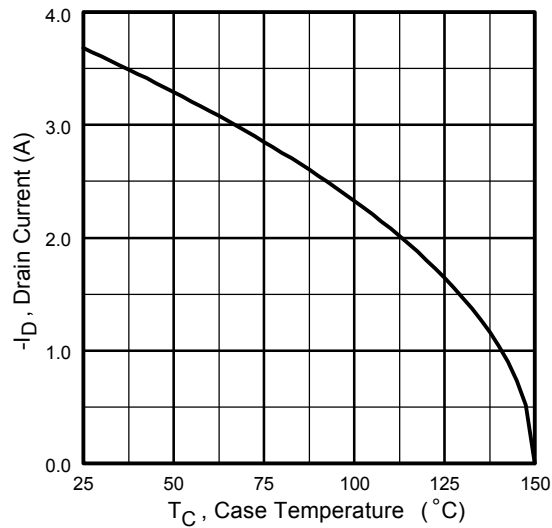


Fig 9. Maximum Drain Current Vs. Case Temperature

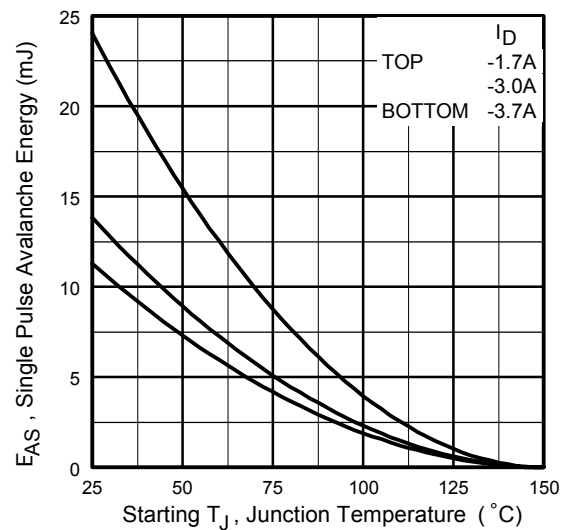


Fig 10. Maximum Avalanche Energy Vs. Drain Current

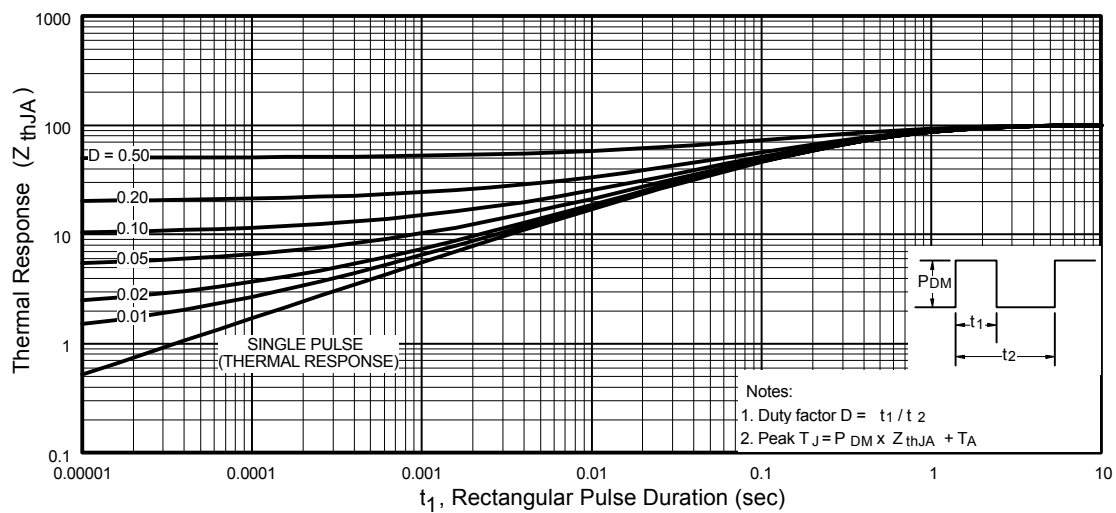


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

RATING AND CHARACTERISTIC CURVES (6402)

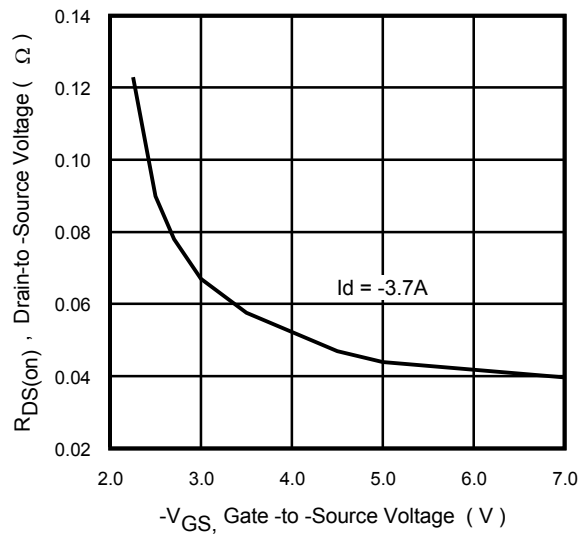


Fig 12. Typical On-Resistance Vs. Gate Voltage

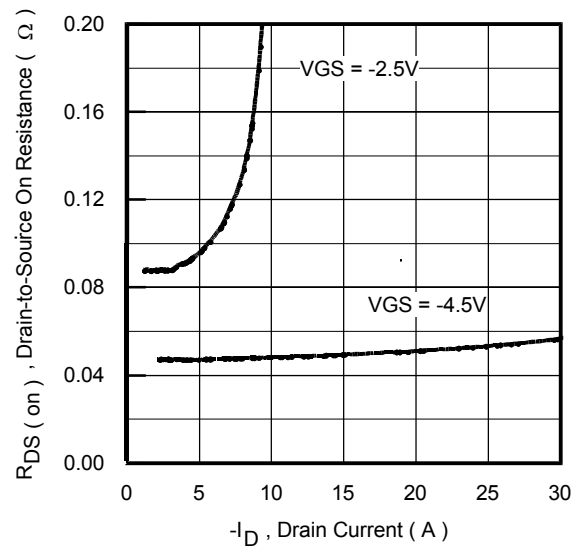


Fig 13. Typical On-Resistance Vs. Drain Current