20V N-Channel Enhancement Mode Power MOSFET

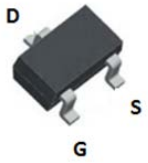
DESCRIPTION：

- Advanced Trench Technology
- Excellent $RDS_{(ON)}$ and Low Gate Charge
- $R_{DS(ON),typ.}$= 135mΩ@V_{GS}=4.5V
- RoHS compliant

V_{DS}	20V
I_D	0.9A
$R_{DS(ON)\_Typ.}$@V_{GS}=4.5V	135mΩ

TYPICAL APPLICATIONS：

- Power Management
- Load Switch



SOT-23

MAXIMUM RATINGS (at T_A = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±10	V
Continuous Drain Current (1)	T_A=25℃ T_A=100℃	I_D	0.9 0.6	A
Pulsed Drain Current		I_{DM}	3.6	A
Power dissipation		P_D	0.23	W
Operating & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction-to-Ambient	$R_{\theta JA}$	543	℃/W

ELECTRICAL CHARATERISTICS (at T_A = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	20			V
Zero Gate Voltage Drain Current VDS = 20 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±10V, VDS = 0V	I_{GSS}			±10	uA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	0.4	0.7	1.0	V
Drain-Source On-State Resistance VGS = 4.5V, ID = 0.5A VGS = 2.5V, ID = 0.4A	$R_{DS(on)}$		135 195	240 280	mΩ
Input capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{iss}		60		pF
Output capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{oss}		22		pF
Reverse transfer capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{rss}		12		pF
Total Gate Charge VDS= 10V, ID= 0.9A,VGS= 4.5V	Q_G		1		nC
Gate to Source Charge VDS= 10V, ID= 0.9A,VGS= 4.5V	Q_{GS}		0.28		nC
Gate to Drain Charge VDS= 10V, ID= 0.9A,VGS= 4.5V	Q_{GD}		0.22		nC
Turn-on delay time VDS=10 V, VGS= 4.5V, ID= 0.5A, R_{GEN}= 10Ω	td (ON)		2		ns
Turn-on Rise time VDS=10 V, VGS= 4.5V, ID= 0.5A, R_{GEN}= 10Ω	tr		19		ns
Turn-off delay time VDS=10 V, VGS= 4.5V, ID= 0.5A, R_{GEN}= 10Ω	td (OFF)		10		ns
Turn-off Fall time VDS=10 V, VGS= 4.5V, ID= 0.5A, R_{GEN}= 10Ω	tf		23		ns

Body Diode

Drain to Source Diode Forward Current	I_S			0.9	A
Drain to Source Diode Forward Voltage VGS = 0V, I_{SD} = 0.9A	V_{SD}			1.2	V

Typical Characteristics

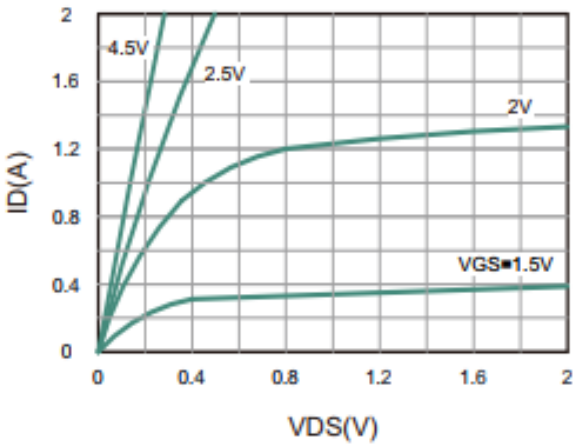


Figure 1. Output Characteristics

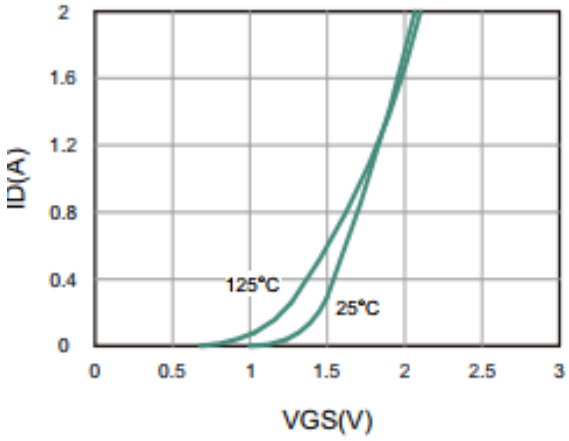


Figure 2. Transfer Characteristics

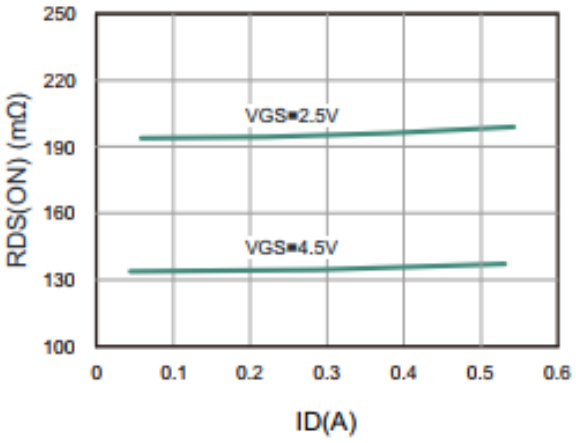


Figure 3. On-resistance vs. Drain Current

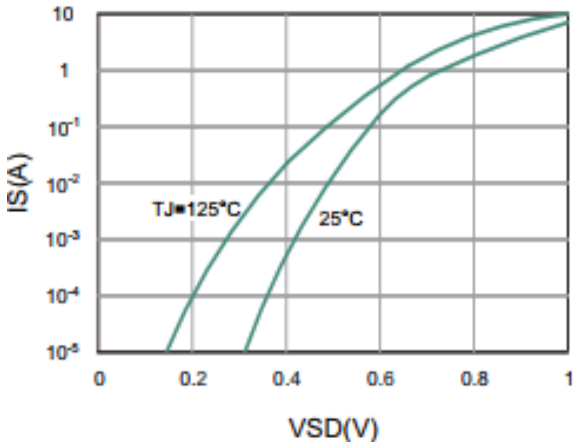


Figure 4. Body Diode Characteristics

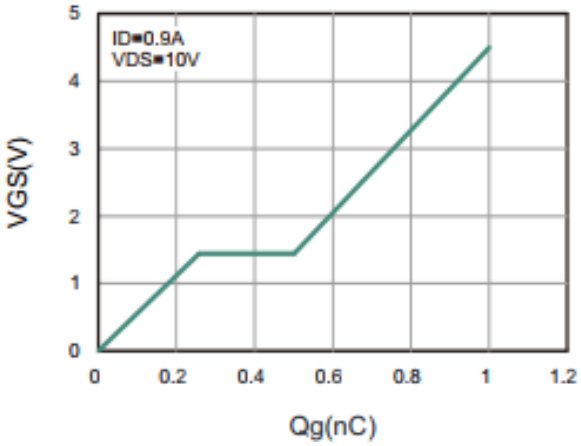


Figure 5. Gate Charge Characteristics

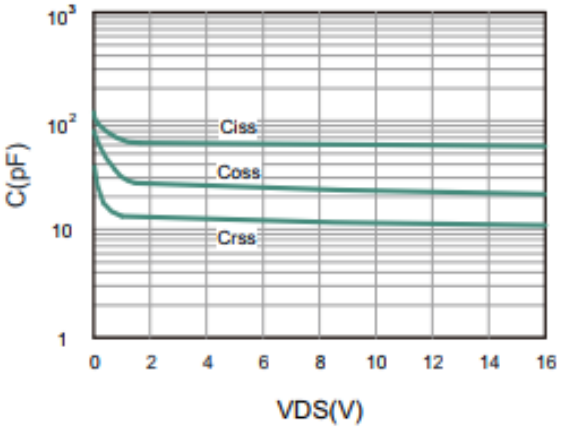


Figure 6. Capacitance Characteristics

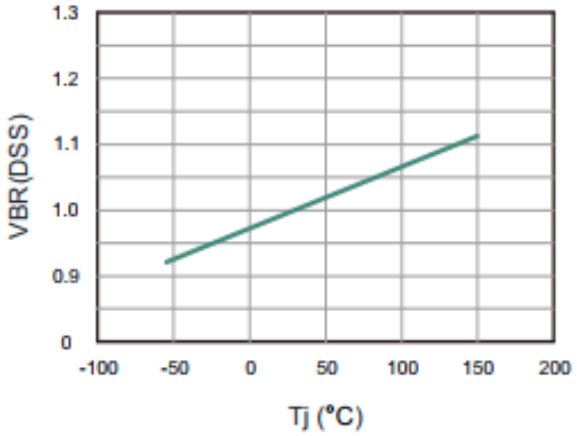


Figure 7. Normalized Breakdown Voltage vs. Junction Temperature

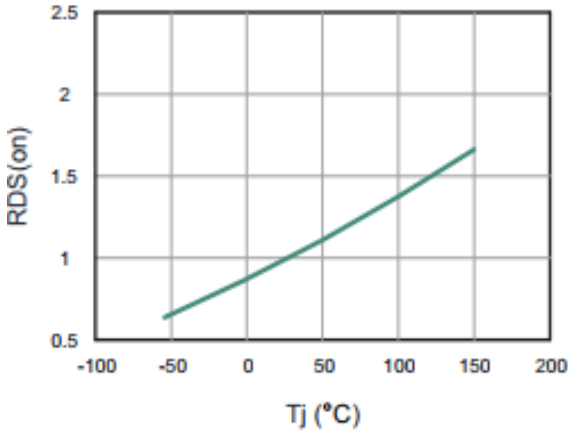


Figure 8. Normalized on Resistance vs. Junction Temperature

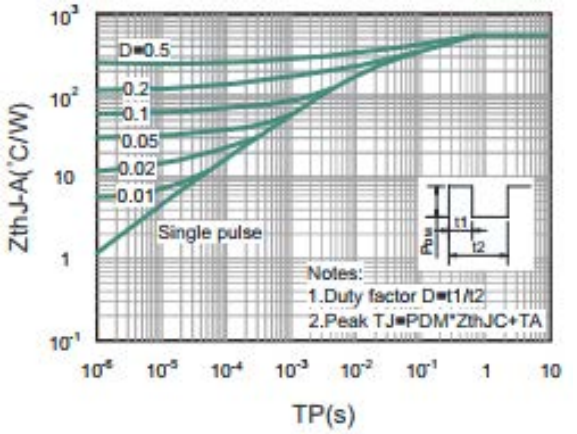


Figure 9. Maximum Effective Transient Thermal Impedance, Junction to Ambient

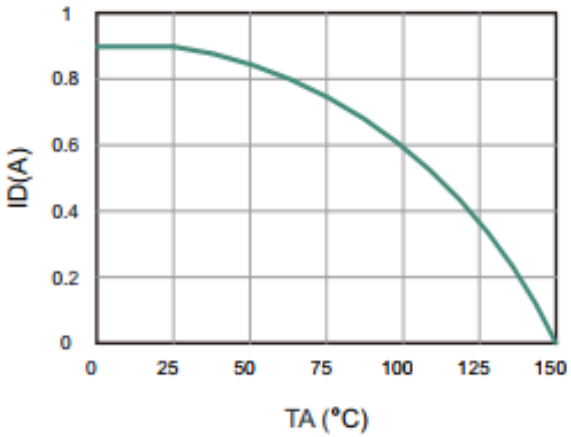


Figure 10. Maximum Continuous Drain Current vs.Ambient Temperature

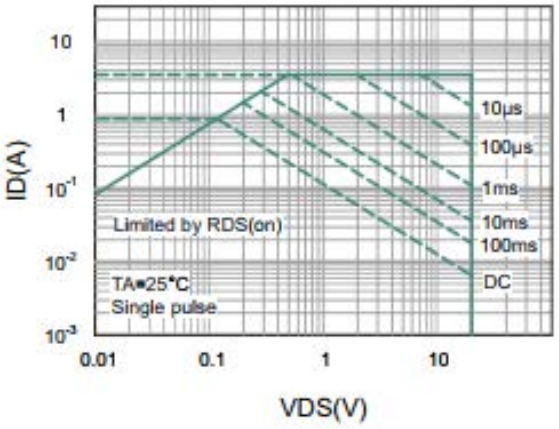
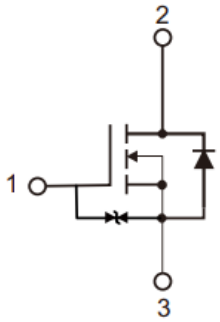
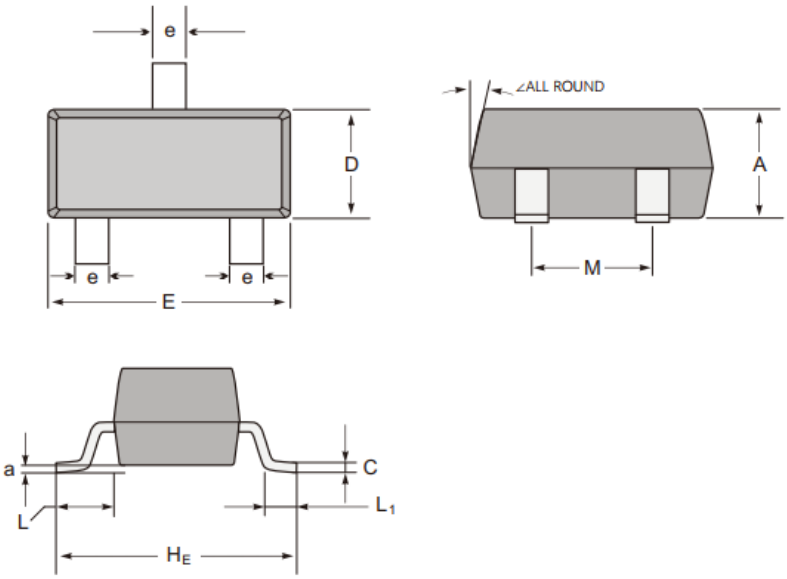


Figure 11. Maximum Safe Operating Area

・Circuit diagram



・SOT-23 Package outlines : Dimensions in (mm)



SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a	∠
mm	max	1.1	0.20	1.4	3.0	2.6	0.6	1.95	0.55 (ref)	0.36 (ref)	0.15	12°
	min	0.9	0.08	1.2	2.8	2.2	0.35	1.7			0.0	
mil	max	43	7.9	55	118	102	24	77	22 (ref)	14 (ref)	6	
	min	35	3.1	47	110	87	13	67			0.0	

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