20V N-Channel Power MOSFET

DESCRIPTION：

·Advanced Trench Technology

·Excellent RDS(ON) and Low Gate Charge

·Lead free product is acquired

·ESD Rating: HBM 2KV

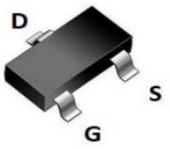
V_{DS}	20V
I_D	5A
$R_{DS(ON)_MAX}$ @V_{GS}=4.5V	22mΩ

TYPICAL APPLICATIONS：

·Load Switch

·PWM Application

·Power management



SOT-23

MAXIMUM RATINGS (at T_C = 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	T_A=25℃ T_A=100℃	I_D	5 3.3	A
Pulsed Drain Current		I_{DM}	20	A
Power dissipation	T_A=25℃	P_D	0.9	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient	$R_{\theta JA}$	139	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 1mA	$V_{(BR)DSS}$	20			V
Zero Gate Voltage Drain Current VDS = 20 V, VGS = 0 V	I_{DSS}			1.0	uA
Gate-Source Leakage Current VGS = ±10V, VDS = 0V	I_{GSS}			±10	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	0.4	0.7	1	V
Drain-Source On-State Resistance VGS = 4.5V, ID = 5A VGS = 2.5V, ID = 3A	$R_{DS(on)}$		 17 26	 22 36	mΩ
Input capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{iss}		545		pF
Output capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{oss}		103		pF
Reverse transfer capacitance f=1MHz, VDS=10 V, VGS=0 V	C_{rss}		90		pF
Total Gate Charge VDS= 10V, ID= 5A,VGS= 4.5V	Q_G		8		nC
Gate to Source Charge VDS= 10V, ID= 5A,VGS= 4.5V	Q_{GS}		2.5		nC
Gate to Drain Charge VDS= 10V, ID= 5A,VGS= 4.5V	Q_{GD}		3		nC
Turn-on delay time VDD=10 V, VGS= 5V, R_L=1.5Ω, R_{GEN}=3Ω	$td_{(ON)}$		0.5		ns
Rise time VDD=10 V, VGS= 5V, R_L=1.5Ω, R_{GEN}=3Ω	tr		1		ns
Turn-off delay time VDD=10 V, VGS= 5V, R_L=1.5Ω, R_{GEN}=3Ω	$td_{(OFF)}$		12		ns
Fall time VDD=10 V, VGS= 5V, R_L=1.5Ω, R_{GEN}=3Ω	tf		4		ns
Maximum Continuous Drain to Source Diode Forward Current	IS			5	A
Maximum Pulsed Drain to Source Diode Forward Current	ISM			20	A
Diode Forward Voltage IS = 5A, VGS = 0V	VSD			1.2	V

Typical Performance Characteristics

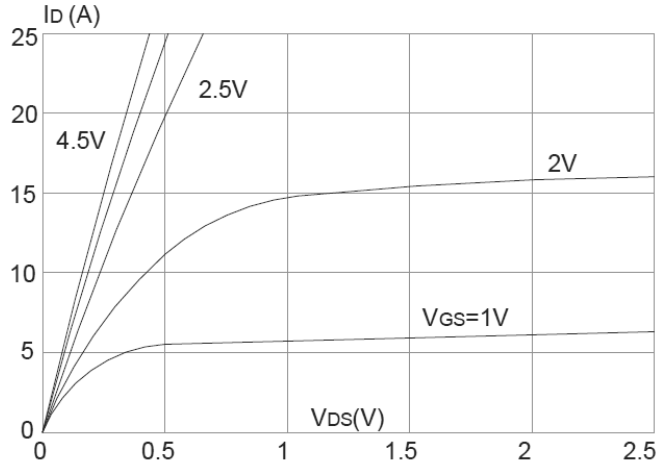


Figure 1. Output Characteristics

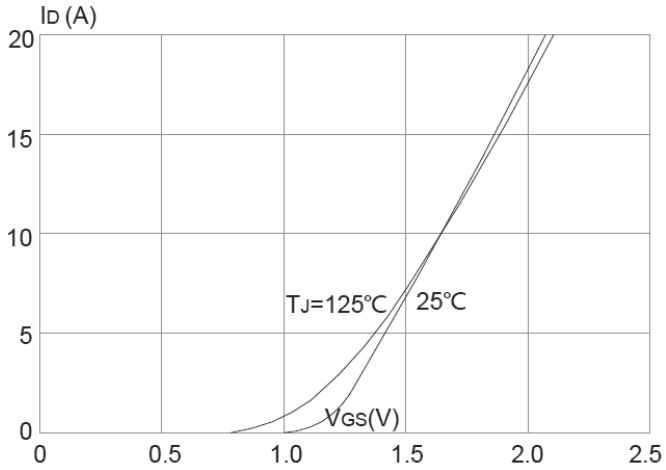


Figure 2. Typical Transfer Characteristics

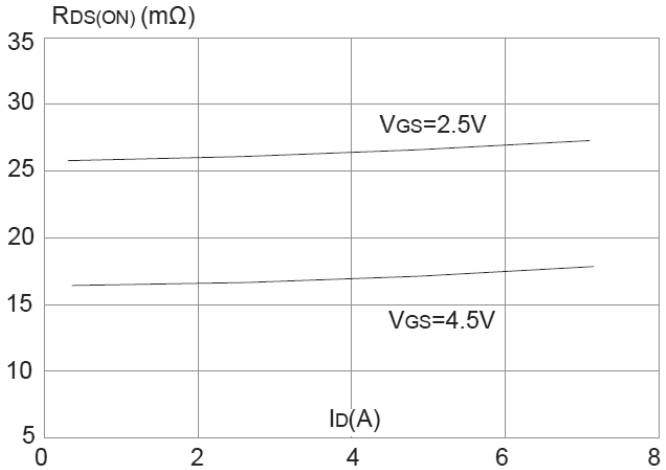


Figure 3. $R_{DS(ON)}$ vs. Drain Current

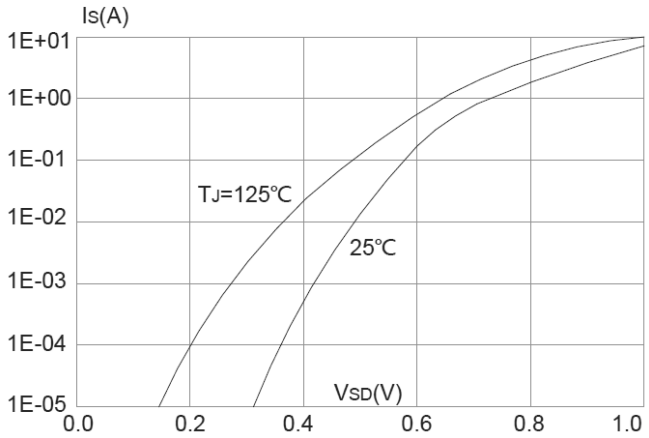


Figure 4: Body Diode Characteristics

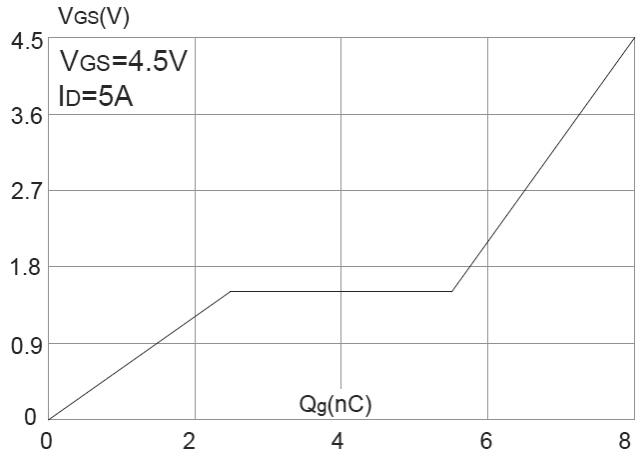


Figure 5: Gate Charge Characteristics

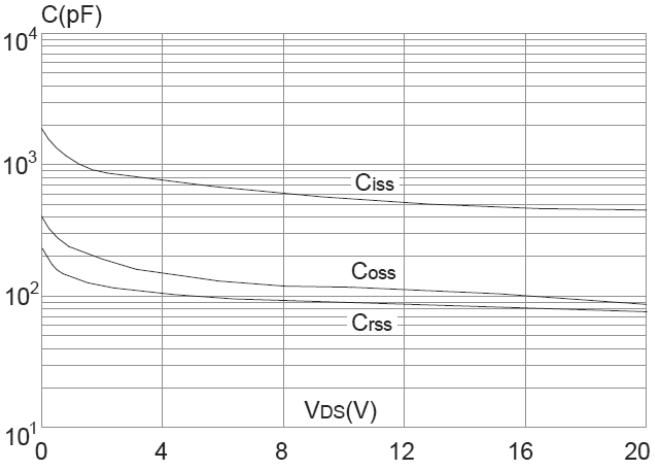


Figure 6: Capacitance Characteristics

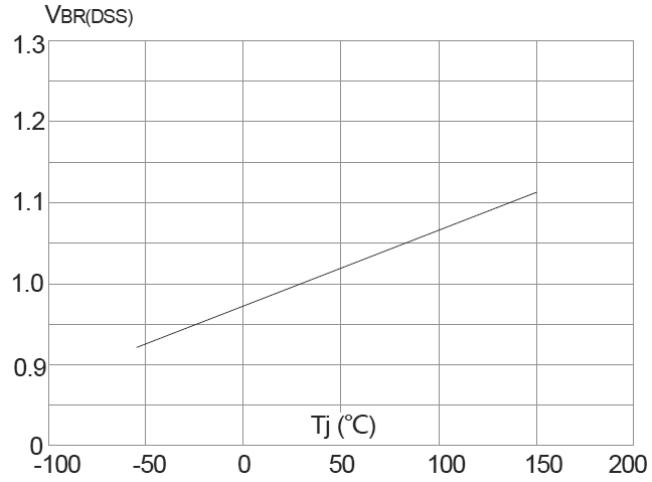


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

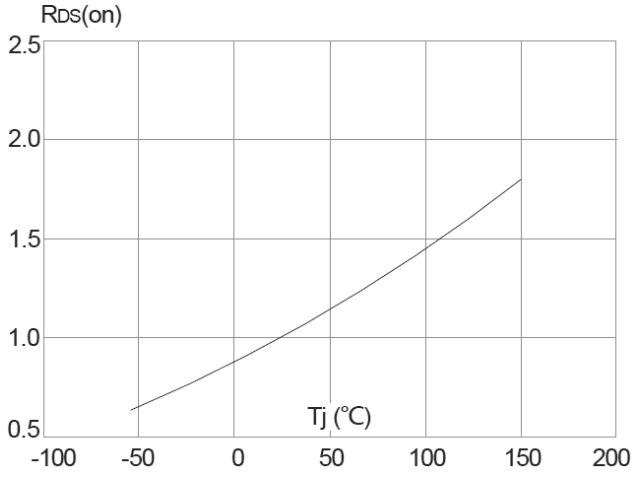


Figure 8: Normalized on Resistance vs. Junction Temperature

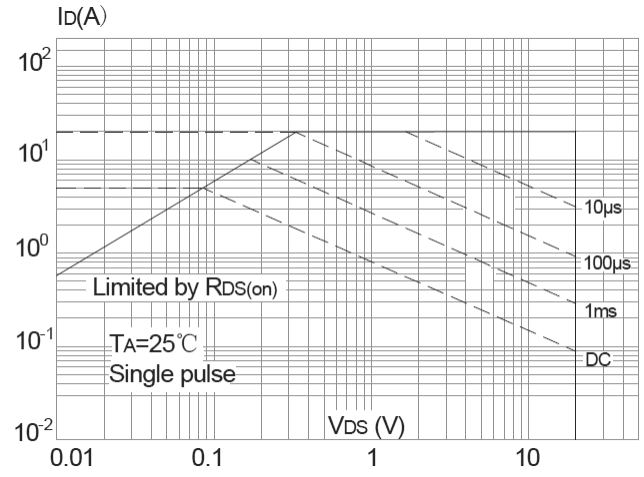


Figure 9: Maximum Safe Operating Area

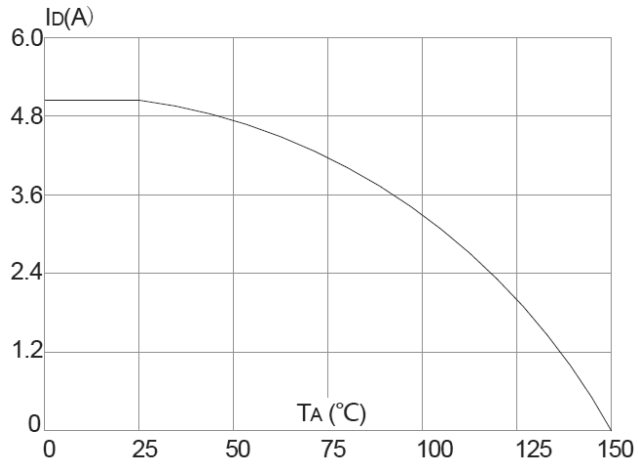


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

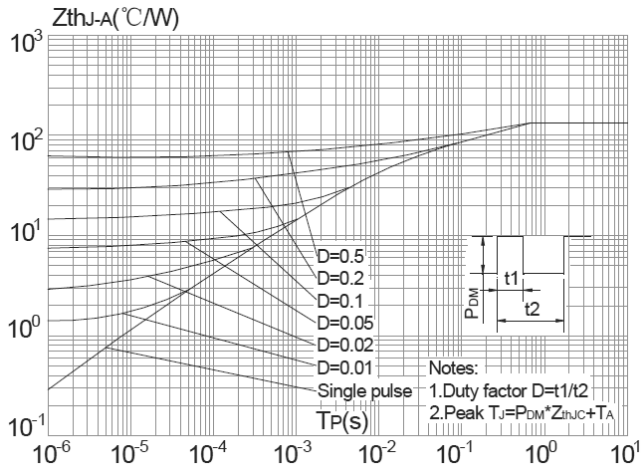
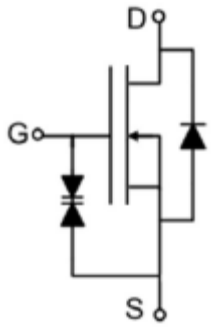
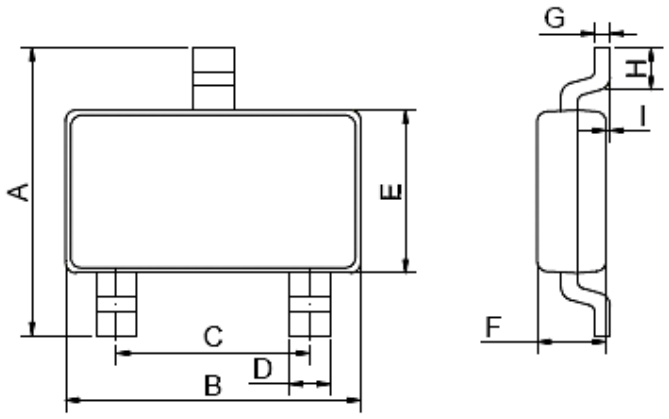


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

·Circuit diagram



·Package outlines :



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

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