-12V P-Channel Power MOSFET

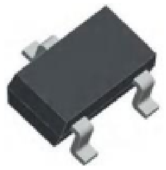
DESCRIPTION：

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

V_{DSS}	-12V
I_D	-4.1A
$R_{DS(ON)\_MAX.}$ @V_{GS}=-4.5V	36mΩ

TYPICAL APPLICATIONS：

- PWM Applications
- Load Switch
- Power Management



SOT-23

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-12	V
Gate-Source Voltage	V_{GSS}	±8	V
Continuous Drain Current TC = 25℃ TC = 100℃	I_D	-4.1 -2.6	A
Pulsed Drain Current，tp<10us(1)	I_{DM}	-34	A
Power dissipation	P_D	1.7	W
Junction & 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	$R_{\theta JA}$	74	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = -250uA	$V_{(BR)DSS}$	-12			V
Zero Gate Voltage Drain Current VDS = -12 V, VGS = 0 V	I_{DSS}			-1	uA
Gate-Source Leakage Current VGS = ±8V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	$V_{GS(th)}$	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance VGS = -4.5V, ID = -4.1A VGS = -2.5V, ID = -3A	$R_{DS(on)}$		26 35	36 53	mΩ
Input capacitance f=1MHz, VDS=-4 V, VGS=0 V	C_{iss}		905		pF
Output capacitance f=1MHz, VDS=-4 V, VGS=0 V	C_{oss}		210		pF
Reverse transfer capacitance f=1MHz, VDS=-4 V, VGS=0 V	C_{rss}		195		pF
Total Gate Charge VDS=-4 V, VGS=-4.5V, ID = -4.1A	Qg		7.8	12	nC
Gate-Source Charge VDS=-4 V, VGS=-4.5V, ID = -4.1A	Qgs		1.2		nC
Gate-Drain(“Miller”) Charge VDS=-4 V, VGS=-4.5V, ID = -4.1A	Qgd		1.6		nC
Turn-on delay time VDD= -4V, V ID=-3.3A, RG=1.0Ω, VGEN=-4.5V, RL=1.2Ω	$t_{d\,(ON)}$		13	20	ns
Rise time VDD= -4V, V ID=-3.3A, RG=1.0Ω, VGEN=-4.5V, RL=1.2Ω	tr		35	53	ns
Turn-off delay time VDD= -4V, V ID=-3.3A, RG=1.0Ω, VGEN=-4.5V, RL=1.2Ω	$t_{d\,(OFF)}$		32	48	ns
Fall time VDD= -4V, V ID=-3.3A, RG=1.0Ω, VGEN=-4.5V, RL=1.2Ω	tf		10	20	ns
Maximum Continuous Drain to Source Diode Forward Current	I_S			-4.1	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}			-0.52	A
Diode Forward Voltage VGS = 0V, IS =- 4.1A	V_{SD}			-2.2	V
Reverse Recovery Time VGS =0V, IS=-4.1A,di/dt=100A/μs	trr		20		ns
Reverse Recovery Charge VGS =0V, IS=-4.1A,di/dt=100A/μs	Qrr		9		nC

Typical Performance Characteristics

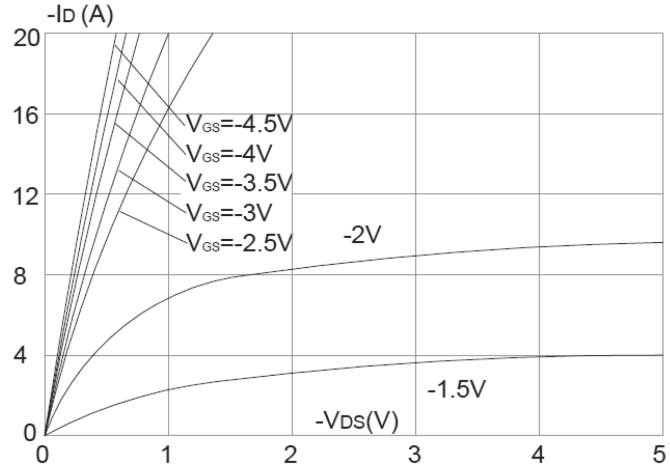


Figure 1. Output Characteristics

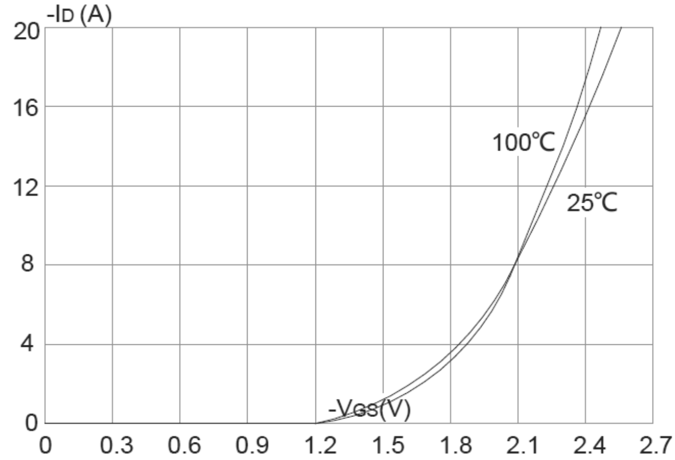


Figure 2. Typical Transfer Characteristics

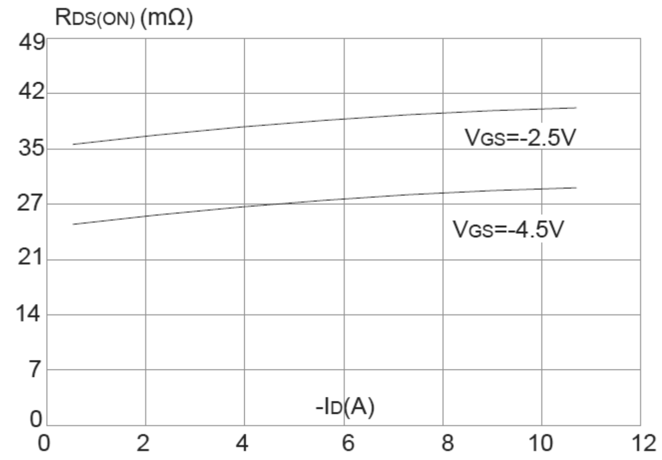


Figure 3. On-resistance vs. Drain Current

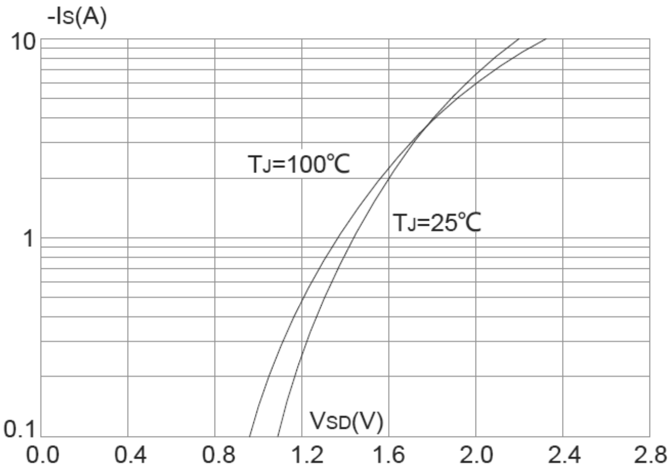


Figure 4. Body Diode Characteristics

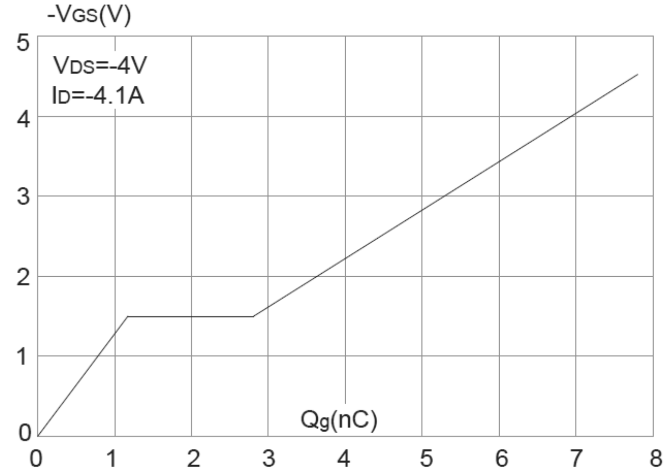


Figure 5. Gate Charge Characteristics

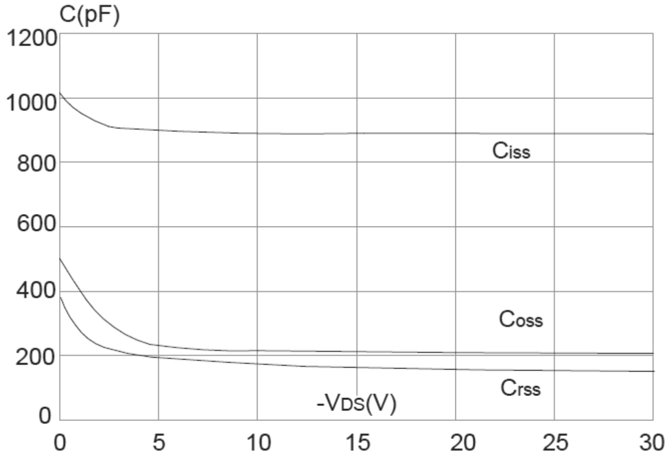


Figure 6. Capacitance Characteristics

Typical Performance Characteristics

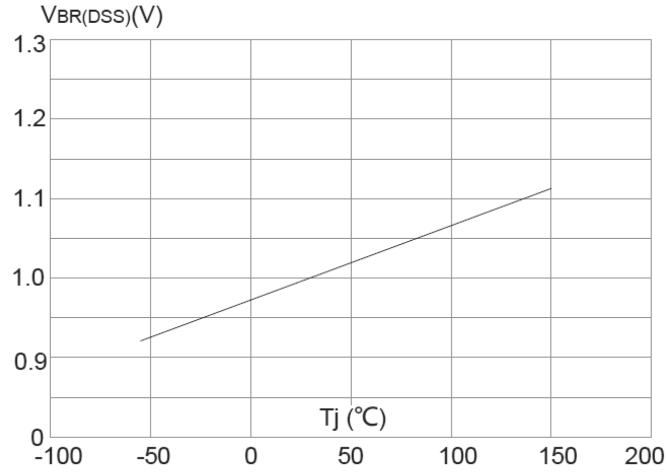


Figure 7. Normalized Breakdown Voltage vs. Junction Temperature

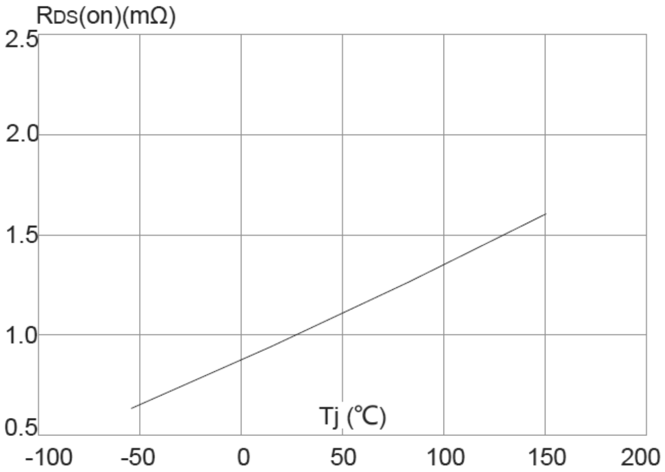


Figure 8. Normalized on Resistance vs. Junction Temperature

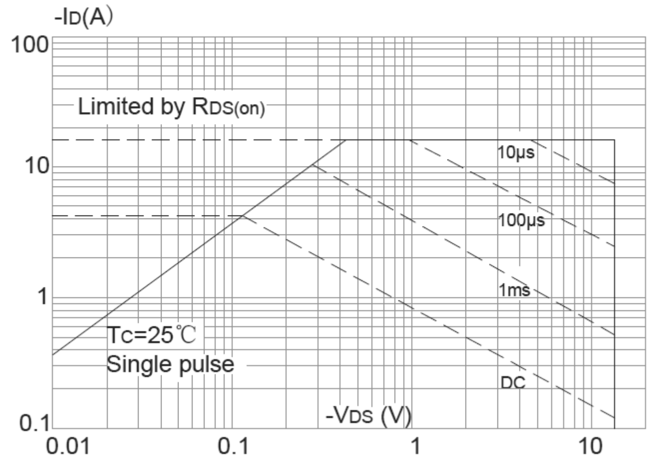


Figure 9. Maximum Safe Operating Area

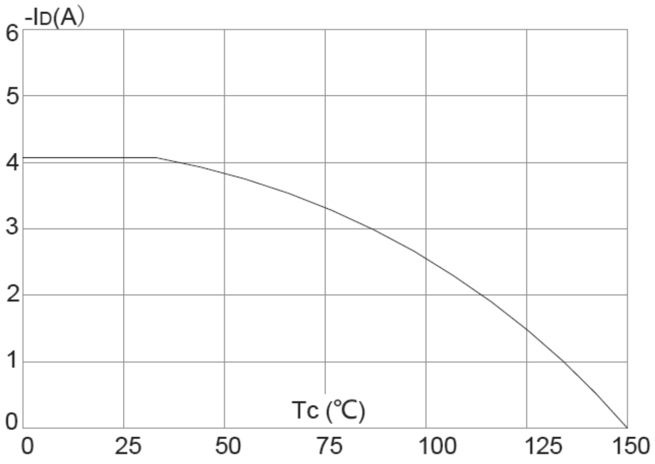


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

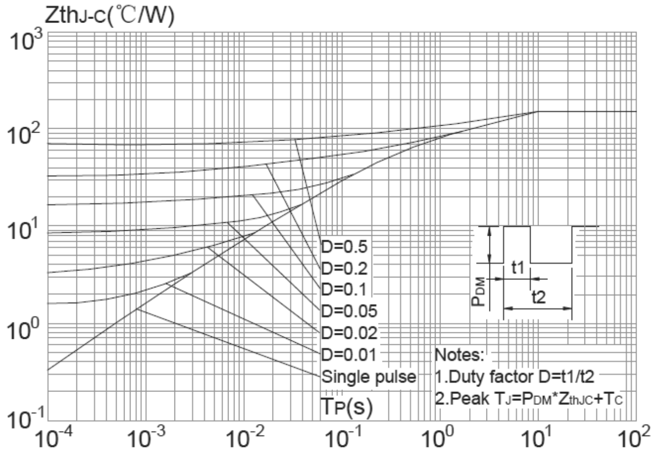
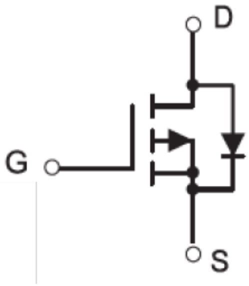
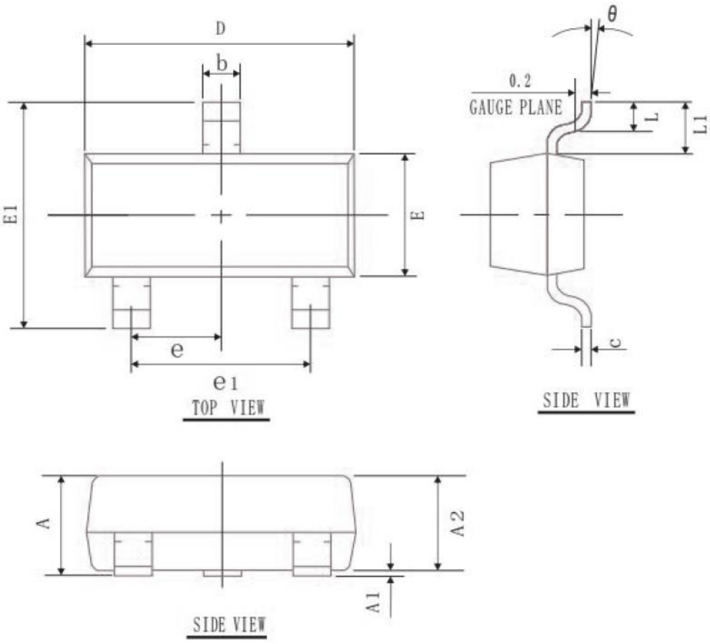


Figure 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

·Circuit diagram



·Package outlines : Dimensions in (mm)



SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

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