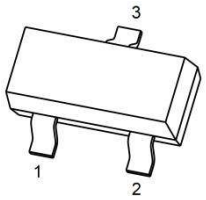
20V P-Channel MOSFET

Product Summary

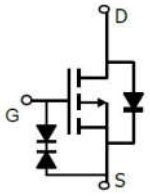
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	26mΩ@-4.5V	-5.3A
	36mΩ@-2.5V	

SOT-23

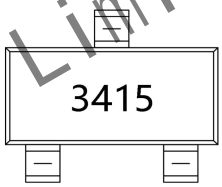


PIN1:GATE
PIN2:SOURCE
PIN3:DRAIN

Schematic diagram



Marking



Features

- Low Gate Charge
- High Power and current handing capability
- Lead free product is acquired
- ESD Protected:2KV

Applications

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

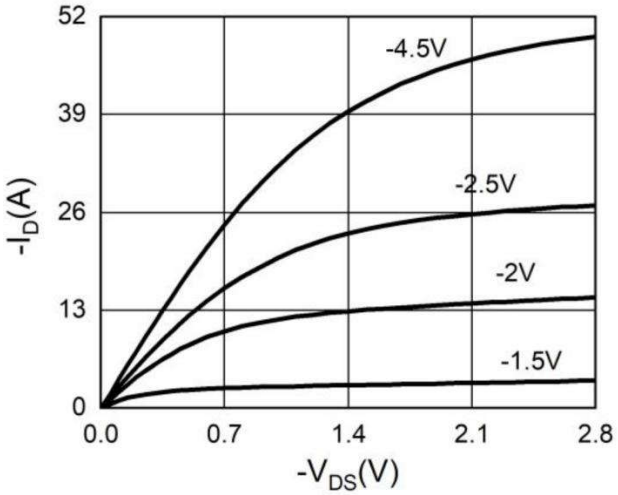
Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	-20	V
Drain Current	T_C = 25℃	I_D	-5.3	A
	T_C = 70℃		-3.2	A
Drain Current - Pulsed[1]		I_{DM}	-16	A
Gate-Source Voltage		V_{GSS}	±12	V
Power Dissipation	T_C = 25℃	P_D	1.3	W
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	95	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

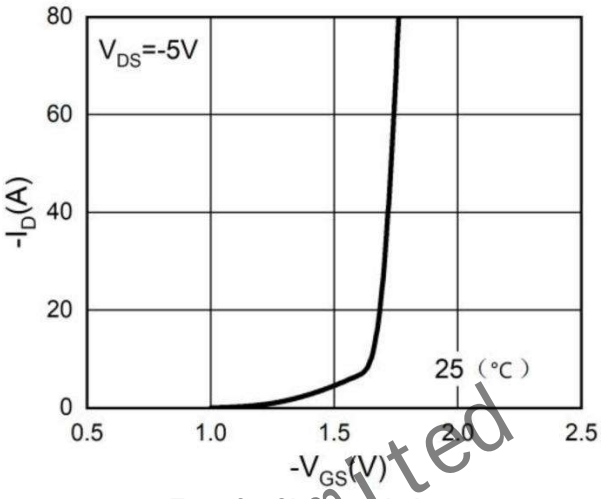
Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= -250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -20V, V_{GS}= 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS}= ±8V, V_{DS}= 0V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= -250μA	-0.5		-1.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = -4.5 V, I_D = -2.5 A		26	35	mΩ
		V_{GS} = -2.5V, I_D = -2 A		36	48	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, F=1.0Mhz		400		pF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			41		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-5A, V_{GS}=-4.5V		9		nC
Gate-source Charge	Q_{gs}			1.6		
Gate-drain Charge	Q_{gd}			1.5		
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V, V_{GS}=-4.5V, R_L=2Ω,R_{GEN}=3Ω,		12		ns
Turn-on Rise Time	t_r			35		
Turn-off Delay Time	$t_{d(off)}$			30		
Turn-off Fall Time	t_f			10		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_{SD} =-5A,T_J = 25℃			-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-5A, dI/dt=100A/μs		170		ns
Reverse Recovery Charge	Q_{rr}			60		nC

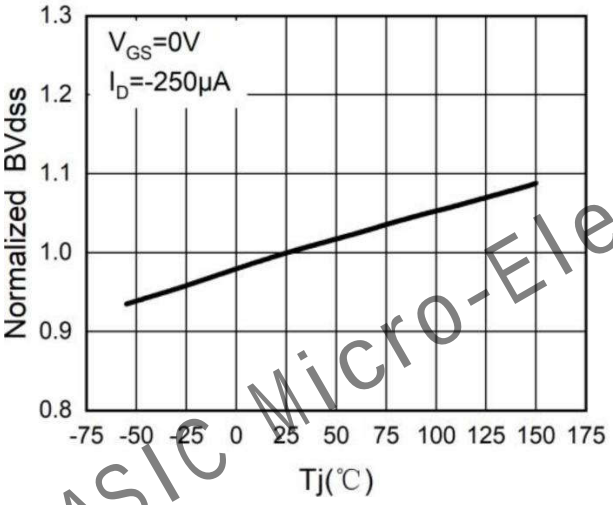
Typical Characteristic



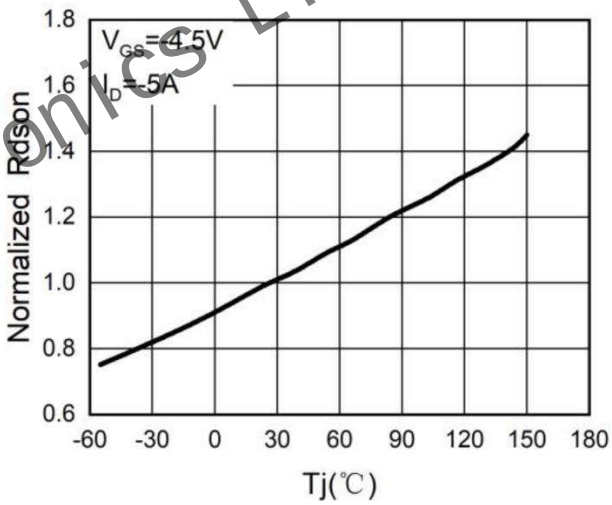
Output Characteristics



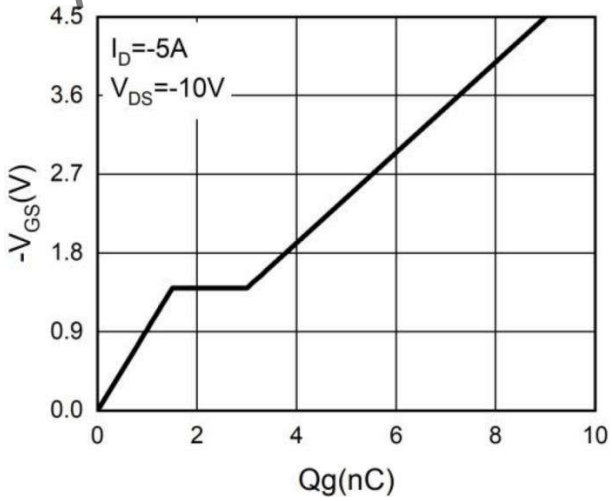
Transfer Characteristics



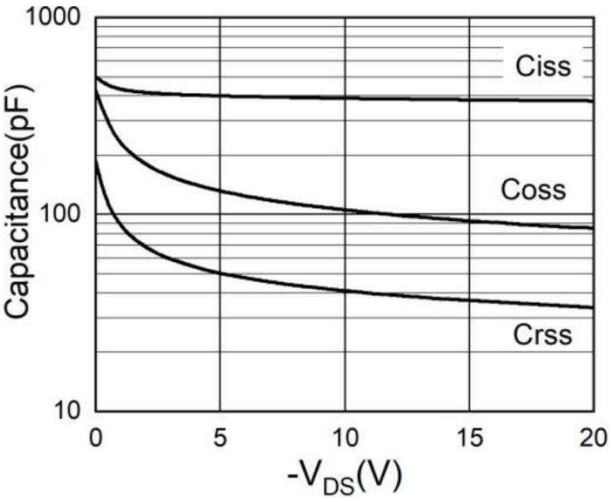
BV_{DSS} vs Junction Temperature



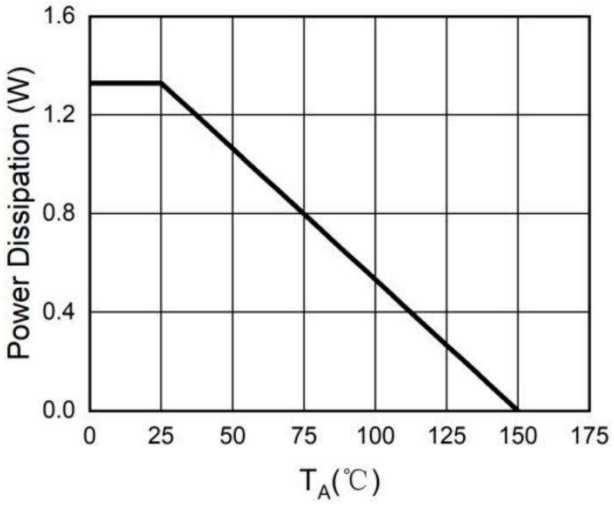
$R_{DS(ON)}$ vs Junction Temperature



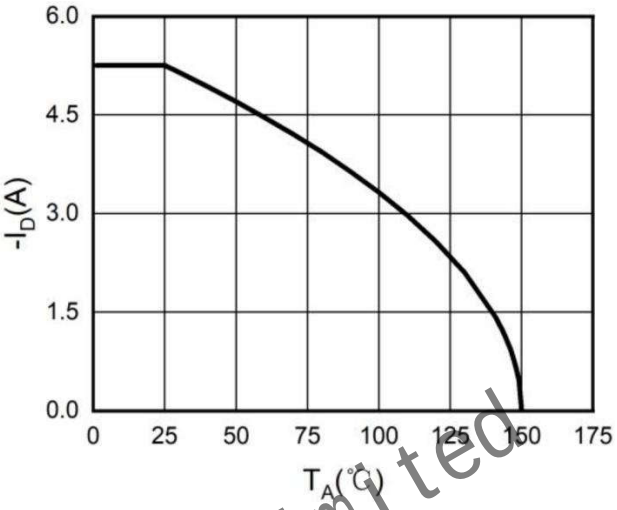
Gate Charge Characteristics



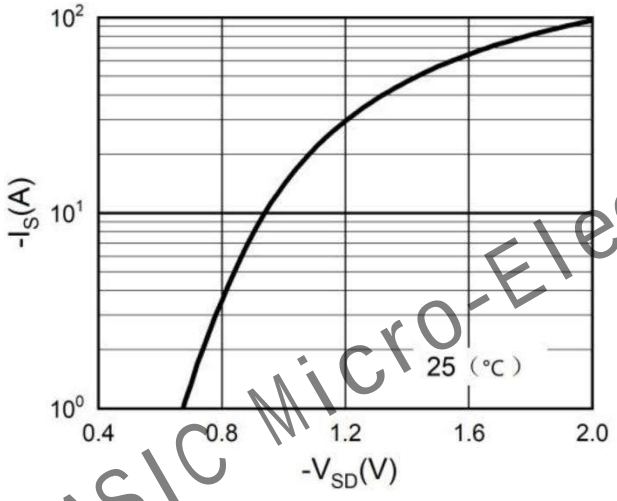
Capacitance Characteristics



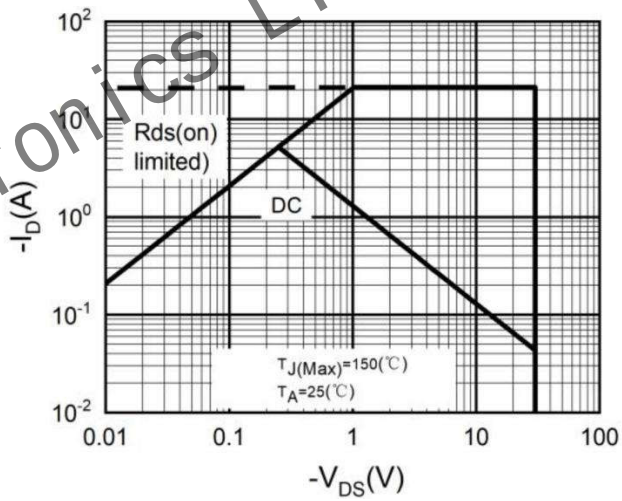
Power Dissipation



Drain Current



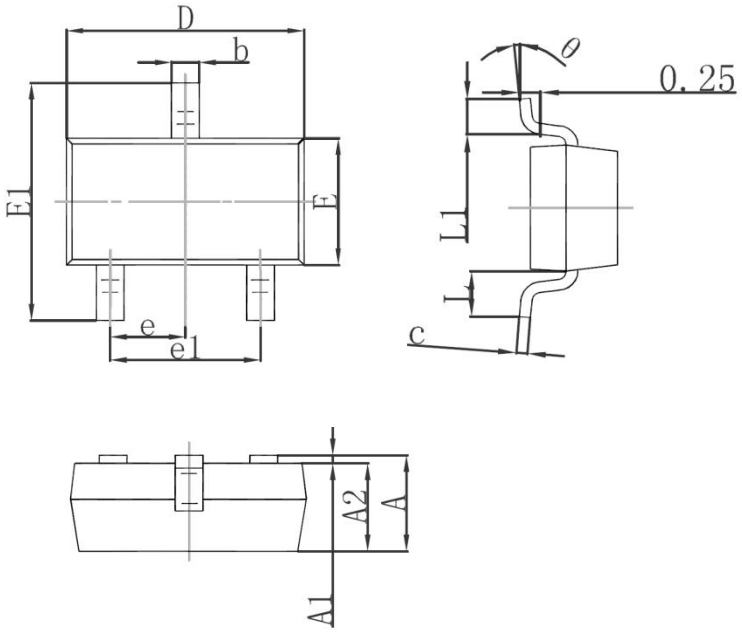
Body-Diode Characteristics



Maximum Safe Operating Area

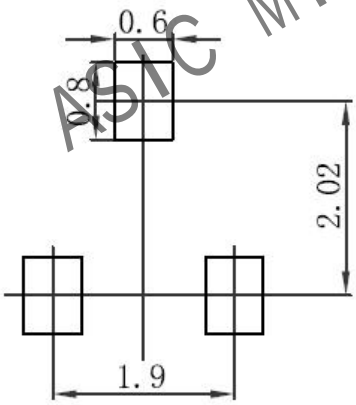
Dimension

SOT-23



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Recommended Land Pattern



Note:

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference only
4. Unit: mm