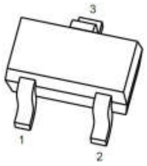
20V N-Channel MOSFET

Product Summary

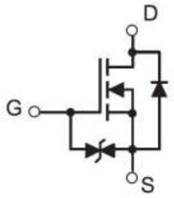
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	160mΩ@4.5V	0.8A
	220mΩ@2.5V	

SOT-523

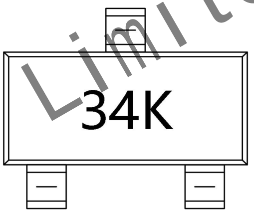


PIN1:GATE
PIN2:SOURCE
PIN3:DRAIN

Schematic diagram



Marking



Features

- Very Low On-resistance $R_{DS(ON)}$
- LowCrss
- Fast switching
- Improved dv/dt capability
- ESD Protected Up to 2.0KV (HBM)

Applications

- PWM application
- Load switch

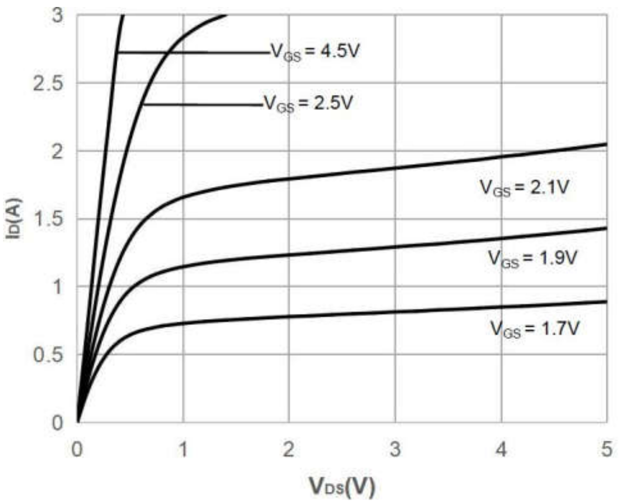
Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±10	V
Drain Current	T_A = 25℃	I_D	0.8	A
	T_A = 100℃		0.5	A
Drain Current - Pulsed		I_{DM}	3.2	A
Power Dissipation	T_A = 25℃	P_D	0.2	W
Thermal Resistance, Junction-to-Ambient		$R_{θJA}$	625	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

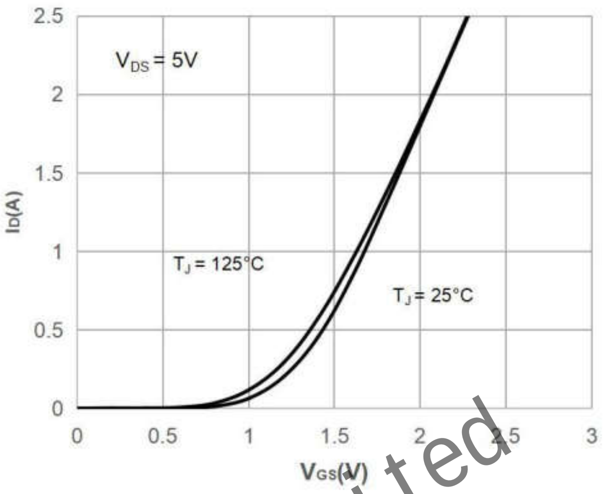
Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	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}= ±10V, V_{DS}= 0V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	0.4	0.7	1.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS}= 4.5V, I_D= 0.5A		160	300	mΩ
		V_{GS}= 2.5V, I_D= 0.3A		220	400	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}= 10V, V_{GS}= 0V, f= 1MHz		53		pF
Output Capacitance	C_{oss}			14		
Reverse Transfer Capacitance	C_{rss}			10		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}= 10V, V_{GS}= 4.5V, I_D= 0.8A		1		nC
Gate-source Charge	Q_{gs}			0.26		
Gate-drain Charge	Q_{gd}			0.21		
Turn-on Delay Time	$t_{d(on)}$	V_{GS}= 4.5V, V_{DS}= 10V, I_D= 0.5A, R_{GEN}= 10Ω		2		ns
Turn-on Rise Time	t_r			19		
Turn-off Delay Time	$t_{d(off)}$			10		
Turn-off Fall Time	t_f			22		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}= 0V, I_S= 0.8A			1.2	V

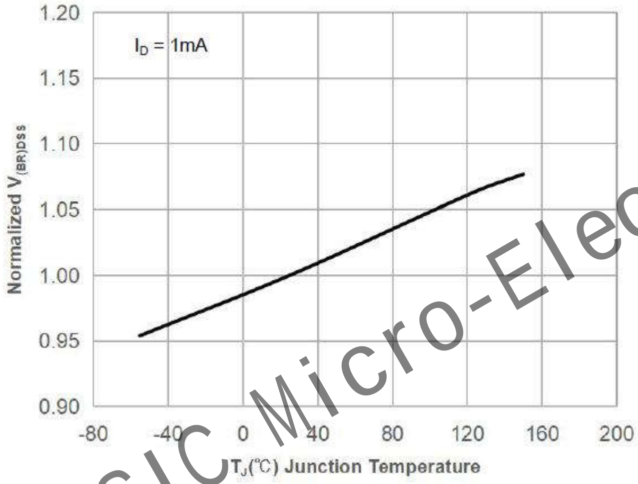
Typical Characteristic



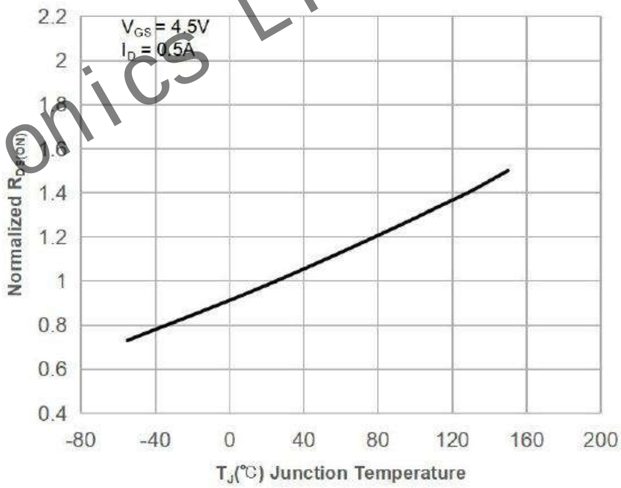
Output Characteristics



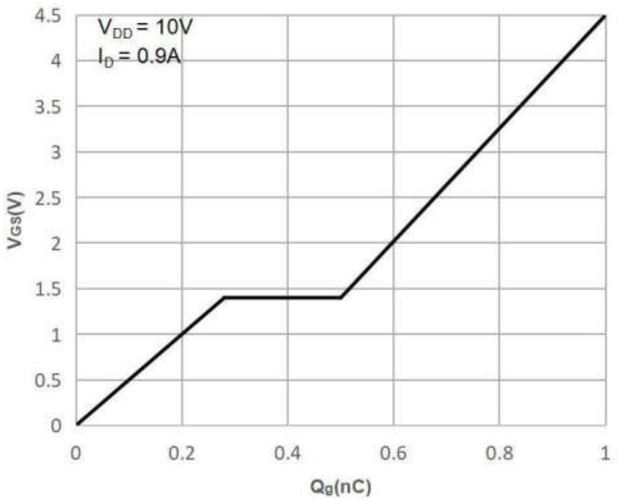
Transfer Characteristics



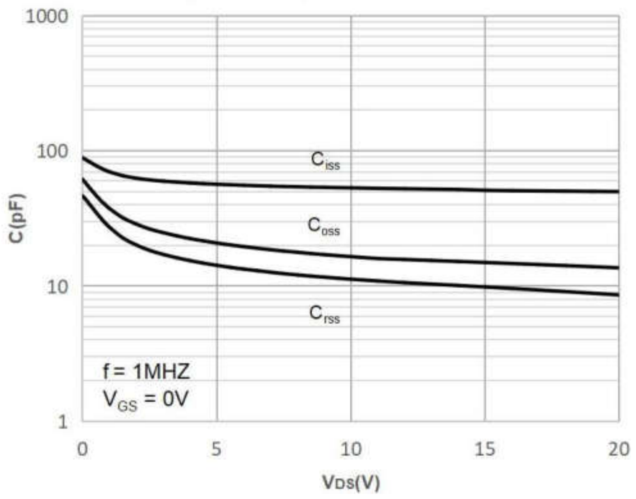
BV$_{DSS}$ vs Junction Temperature



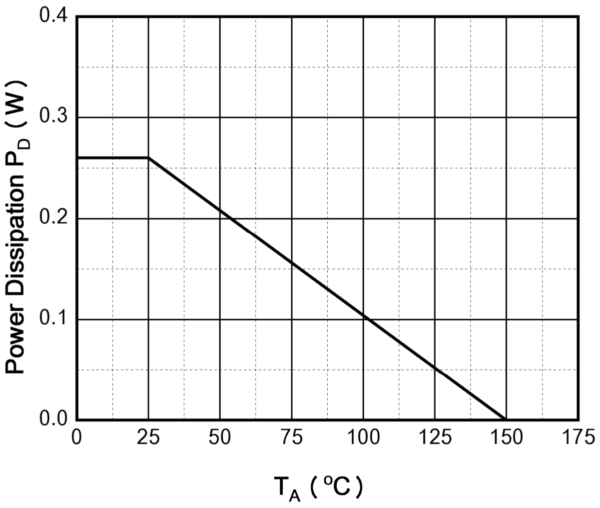
R$_{DS(ON)}$ vs Junction Temperature



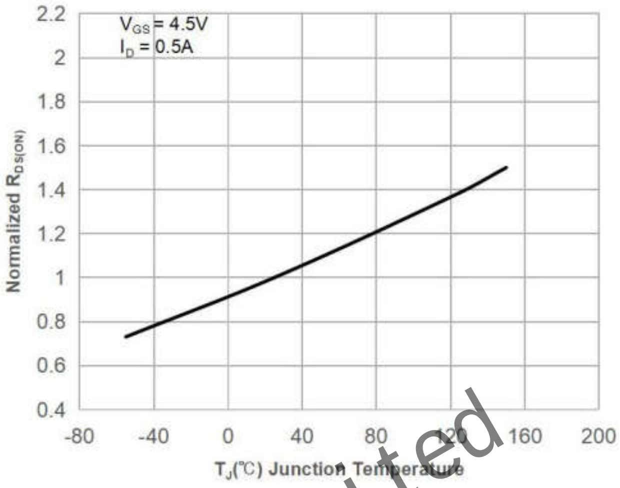
Gate Charge Characteristics



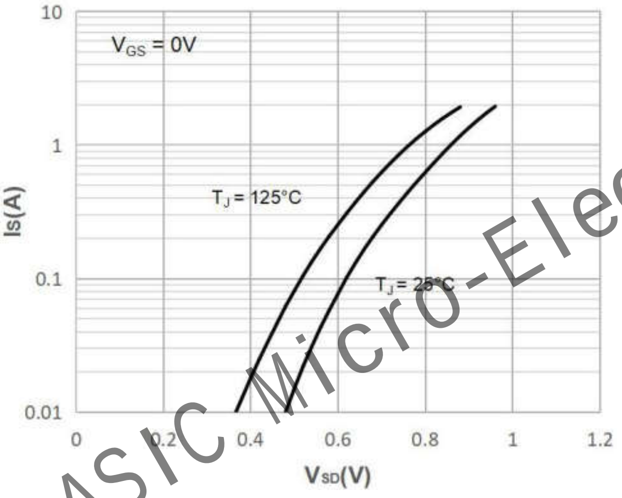
Capacitance Characteristics



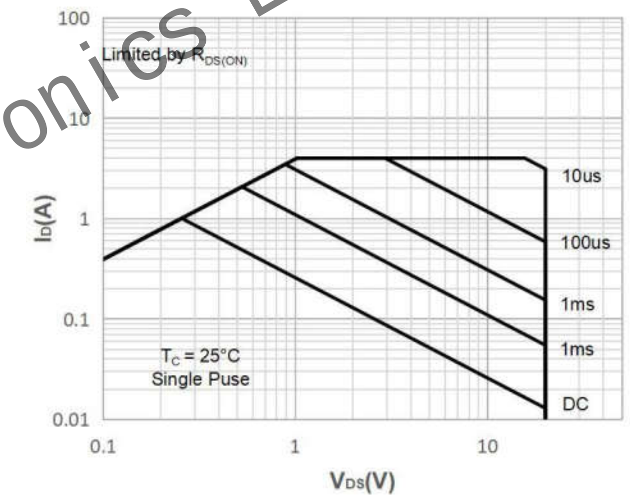
Power Dissipation



Drain Current



Body-Diode Characteristics



Maximum Safe Operating Area

Dimension

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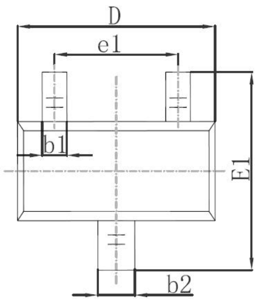
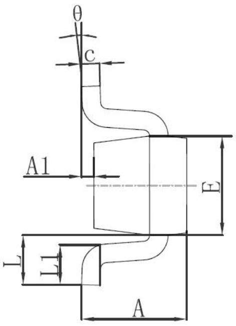
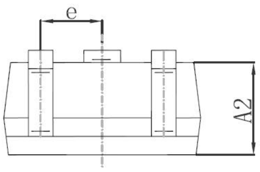
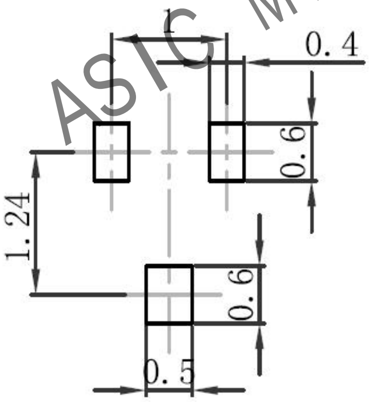






Symbol	Millimeters		Inches	
	Min	**Max**	**Min**	**Max**
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
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