

30V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	22mΩ@10V	5.8A
	24mΩ@4.5V	

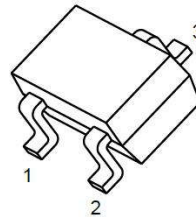
Features

- Low Gate Charge
- High Power and current handling capability
- Lead free product is acquired

Applications

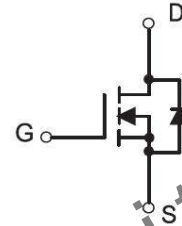
- PWM Application
- Load Switch
- Power Management

SOT-23-3L

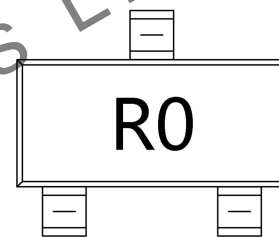


PIN1:GATE
PIN2:SOURCE
PIN3:DRAIN

Schematic diagram



Marking



Absolute Maximum rating ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	30	V
Gate - Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	5.8	A
Pulsed Drain Current	I_{DM}	23.2	A
Power Dissipation	P_D	1.4	W
Avalanche energy ¹	E_{AS}	20	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +150	$^\circ\text{C}$

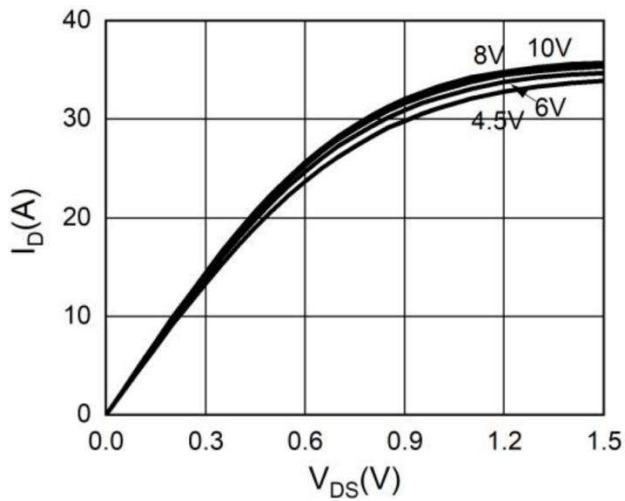
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}= 0V, I_D= 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}= 24V, V_{GS}= 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS}= \pm 12V, V_{DS}= 0V$			± 100	nA
Gate Threshold Voltage ³	$V_{GS(th)}$	$V_{DS}= V_{GS}, I_D= 250\mu A$	0.6		1.25	V
Drain-source On-resistance ³	$R_{DS(on)}$	$V_{GS}= 10V, I_D= 5.8A$		22	29	m Ω
		$V_{GS}= 4.5V, I_D= 5A$		24	32	
Forward transconductance ³	g_{FS}	$V_{DS}= 5V, I_D= 5A$		7.8		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}= 15V, V_{GS}= 0V, f= 1MHz$		696		pF
Output Capacitance	C_{oss}			53		
Reverse Transfer Capacitance	C_{rss}			42		
Gate resistance	R_g	$V_{DS}= 0V, V_{GS}= 0V, f= 1MHz$		1.9		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}= 15V, V_{GS}= 4.5V, I_D= 2A$		20		nC
Gate-source Charge	Q_{gs}			2		
Gate-drain Charge	Q_{gd}			2.2		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}= 4.5V, V_{DS}= 15V, R_L= 7.5\Omega, R_{GEN}= 3\Omega$		5		ns
Turn-on Rise Time	t_r			12		
Turn-off Delay Time	$t_{d(off)}$			24		
Turn-off Fall Time	t_f			2		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}= 0V, I_S= 2A$			1.2	V

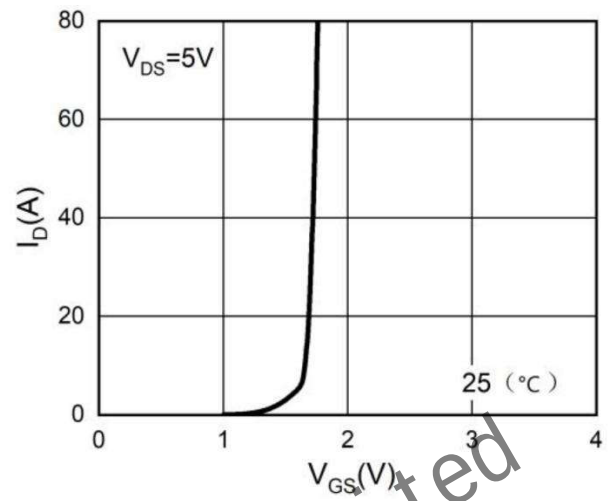
Notes :

1. E_{AS} condition: $T_J = 25^\circ\text{C}, V_{DD} = 30V, V_G = 10V, R_g = 25\Omega, L = 0.5mH$

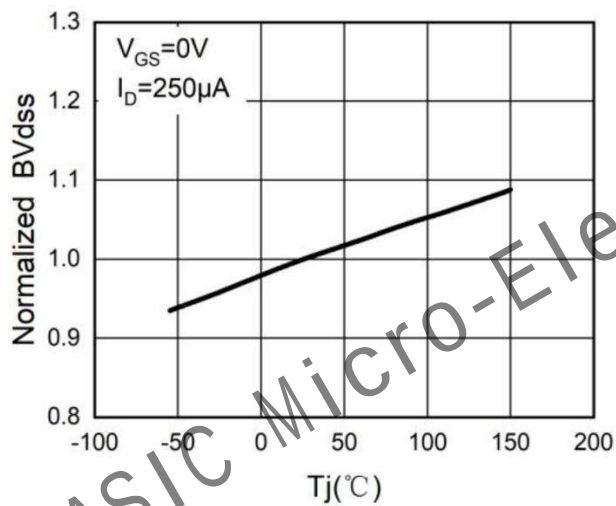
Typical Characteristic



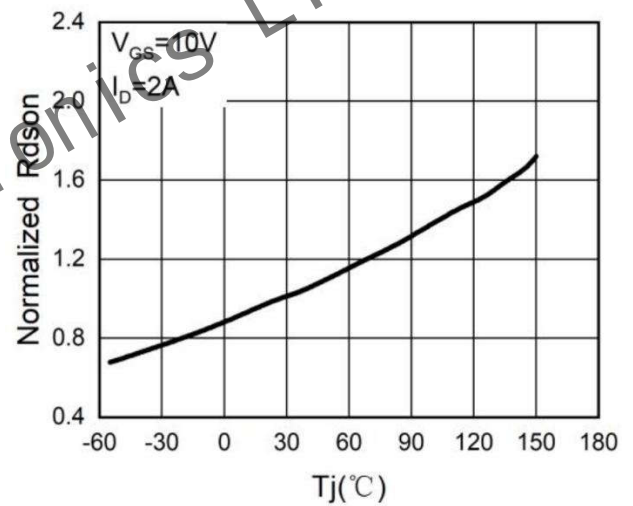
Output Characteristics



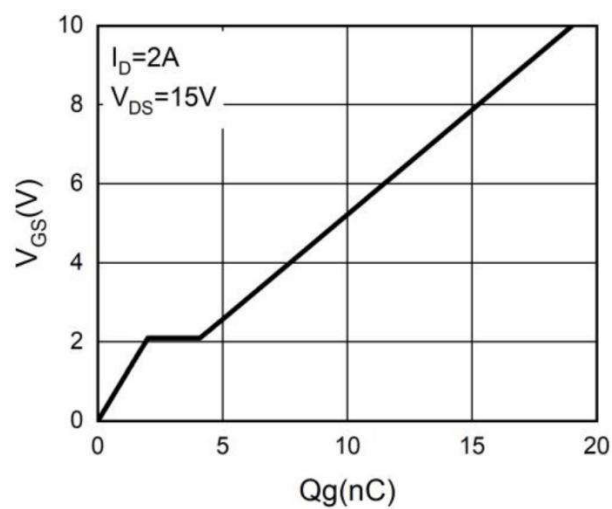
Transfer Characteristics



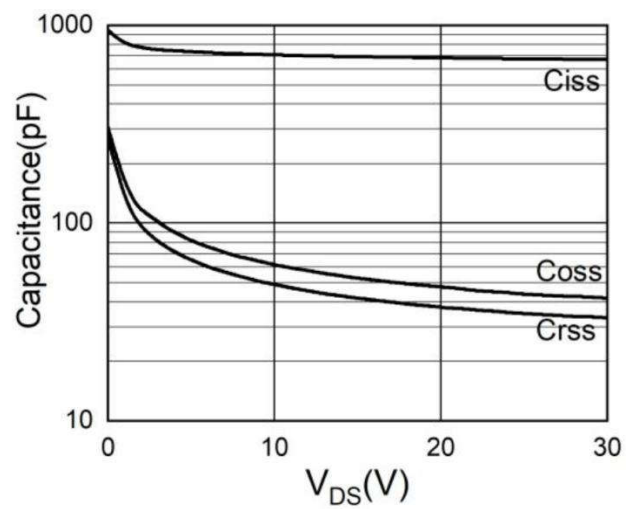
BV_{DS} vs Junction Temperature



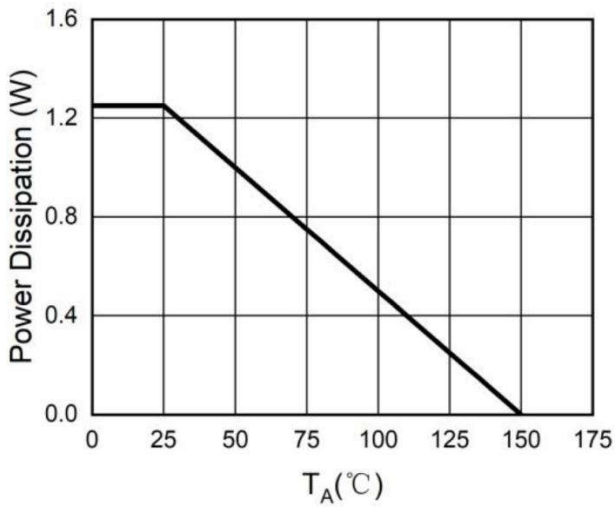
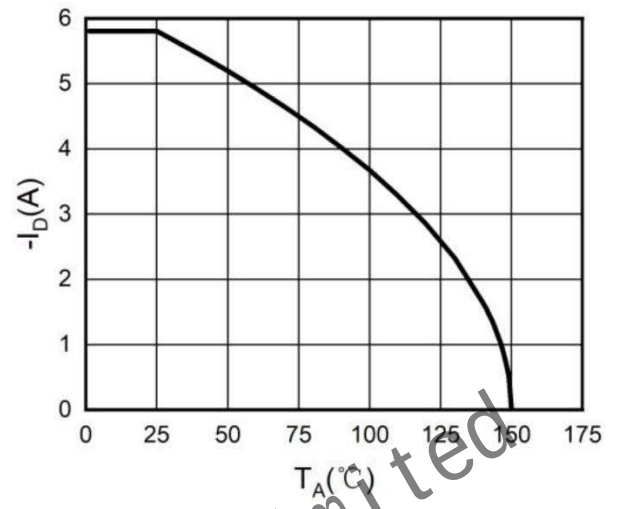
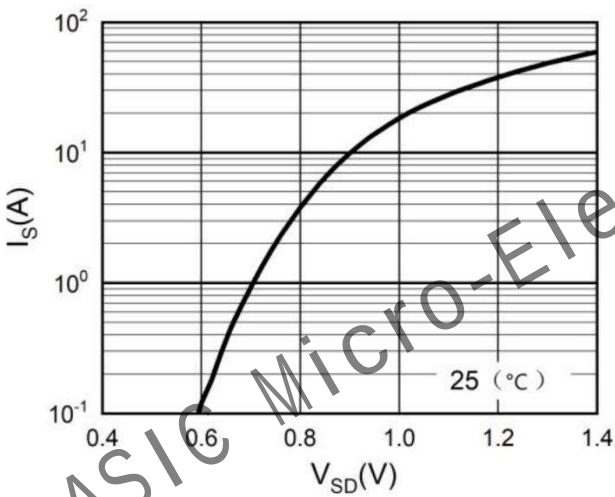
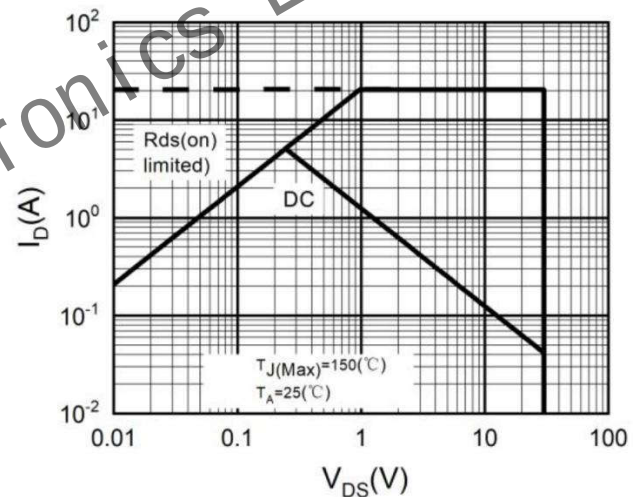
$R_{DS(ON)}$ vs Junction Temperature



Gate Charge Characteristics

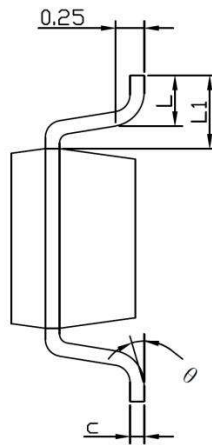
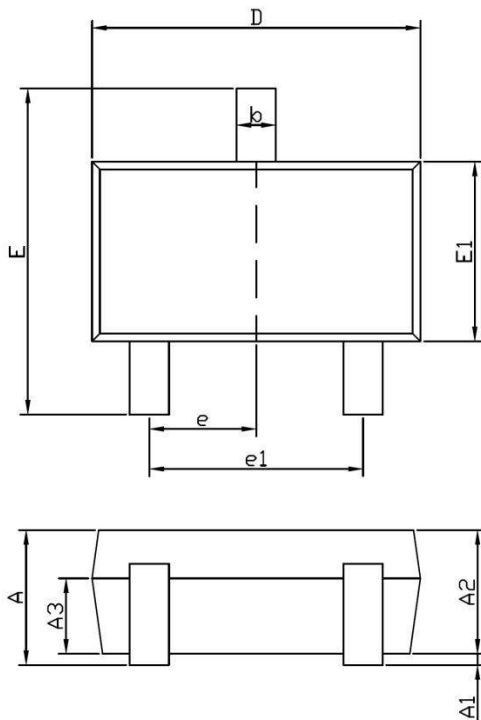


Capacitance Characteristics


Power Dissipation

Drain Current

Body-Diode Characteristics

Maximum Safe Operating Area

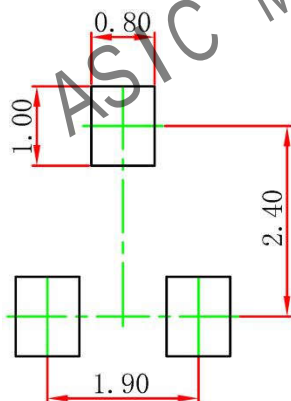
Dimension

SOT-23-3L



Symbol	Millimeters		
	Min.	Typ.	Max.
A			1.25
A1	0.01		0.08
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.33		0.41
c	0.11		0.20
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.90	0.95	1.00
e1	1.90BSC		
L	0.30		0.60
L1	0.55	0.60	0.70
θ	0°		8°

Recommended Land Pattern



Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference only
4. Unit: mm