



### Features

- Low on-resistance
- ESD protected gate up to 2kV HBM
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy

### Shipping Quantity

- 3000pcs / Tape & Reel

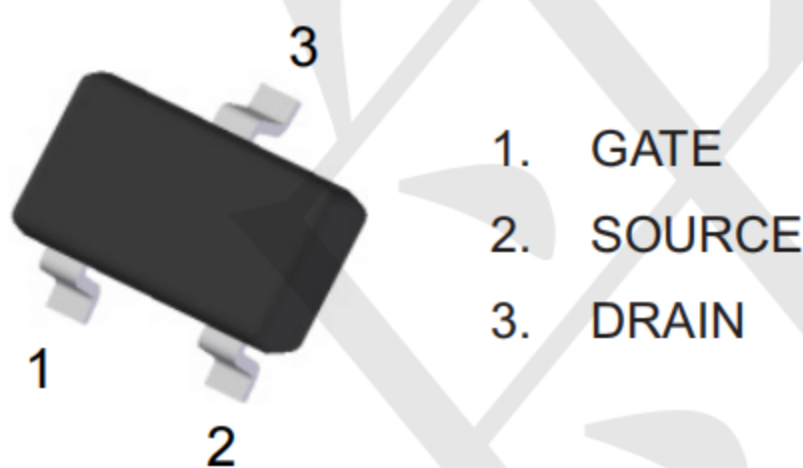
### Typical Applications

- N-channel enhancement mode effect transistor
- Switching application

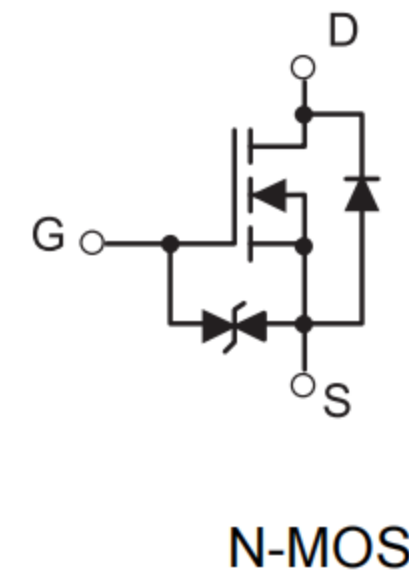
### Mechanical Data

- Case: SOT-323
- Molding Compound, UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Plated Leads, Solderable Per MIL-STD-202, Method 208

### SOT-323



### Circuit Diagram



### Marking: 72K c

### Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

Parameter	Symbol	Value	Units
Drain-Source Voltage	$V_{DSS}$	60	V
Gate -Source Voltage	$V_{GSS}$	±20	V
Continuous Drain Current	$I_D$	300	mA
Pulsed Drain Current ( $t_p = 10\mu s$ )	$I_{DM}$	2000	mA
Single Pulse Avalanche Energy <sup>*2</sup>	$E_{AS}$	0.11	mJ
Power Dissipation	SOT-323 $P_D$	0.25	W



## Thermal Characteristics

Parameter	Symbol	Limits	Unit
Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	500	°C/W
Thermal Resistance Junction to Lead	$R_{\theta JL}$	313	
Thermal Resistance Junction to Case	$R_{\theta JC}$	261	
Operating Junction Temperature Range	$T_J$	-55 to +150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C

## Electrical Characteristics (TA=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	MIN	TYP	MAX	UNIT
<b>OFF Characteristics</b>						
$V_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS} = 60V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 10$	$\mu A$
<b>ON Characteristics</b>						
$R_{DS(ON)}$	Drain-Source On-resistance *1	$V_{GS} = 5V, I_D = 0.05A$	-	1.5	3	$\Omega$
		$V_{GS} = 4.5V, I_D = 0.5A$	-	1.8	4	
		$V_{GS} = 10V, I_D = 0.5A$	-	1.45	2.5	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	2.5	V
$R_G$	Gate Resistance	$V_{GS} = 0V, f = 1.0MHz$	-	39	-	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{ISS}$	Input Capacitance	$V_{GS} = 0V$	-	47.2	-	$\mu F$
$C_{OSS}$	Output Capacitance	$V_{DS} = 20V$	-	7.3	-	
$C_{RSS}$	Reverse Transfer Capacitance	$f = 1.0MHz$	-	4.7	-	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time *3	$V_{DD} = 30V, I_D = 0.2A$ $V_{GS} = 10V, R_G = 25\Omega$ $R_L = 150\Omega$	-	6	-	nS
$t_r$	Turn-on Rise Time *3		-	5	-	
$t_{d(off)}$	Turn-Off Delay Time *3		-	25	-	
$t_f$	Turn-Off Fall Time *3		-	15	-	
$Q_G$	Total Gate-Charge	$V_{DS} = 10V$	-	0.44	-	nC
$Q_{GS}$	Gate to Source Charge	$V_{GS} = 4.5V$	-	0.14	-	nC
$Q_{GD}$	Gate to Drain (Miller) Charge	$I_D = 0.2A$	-	0.2	-	nC
<b>Source-Drain Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage *1	$I_S = 0.3A, V_{GS} = 0V$	-	0.85	1.2	V
$I_S$	Diode Continuous Forward Current	$T_C = 25^\circ C$	-	-	0.3	A





Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)

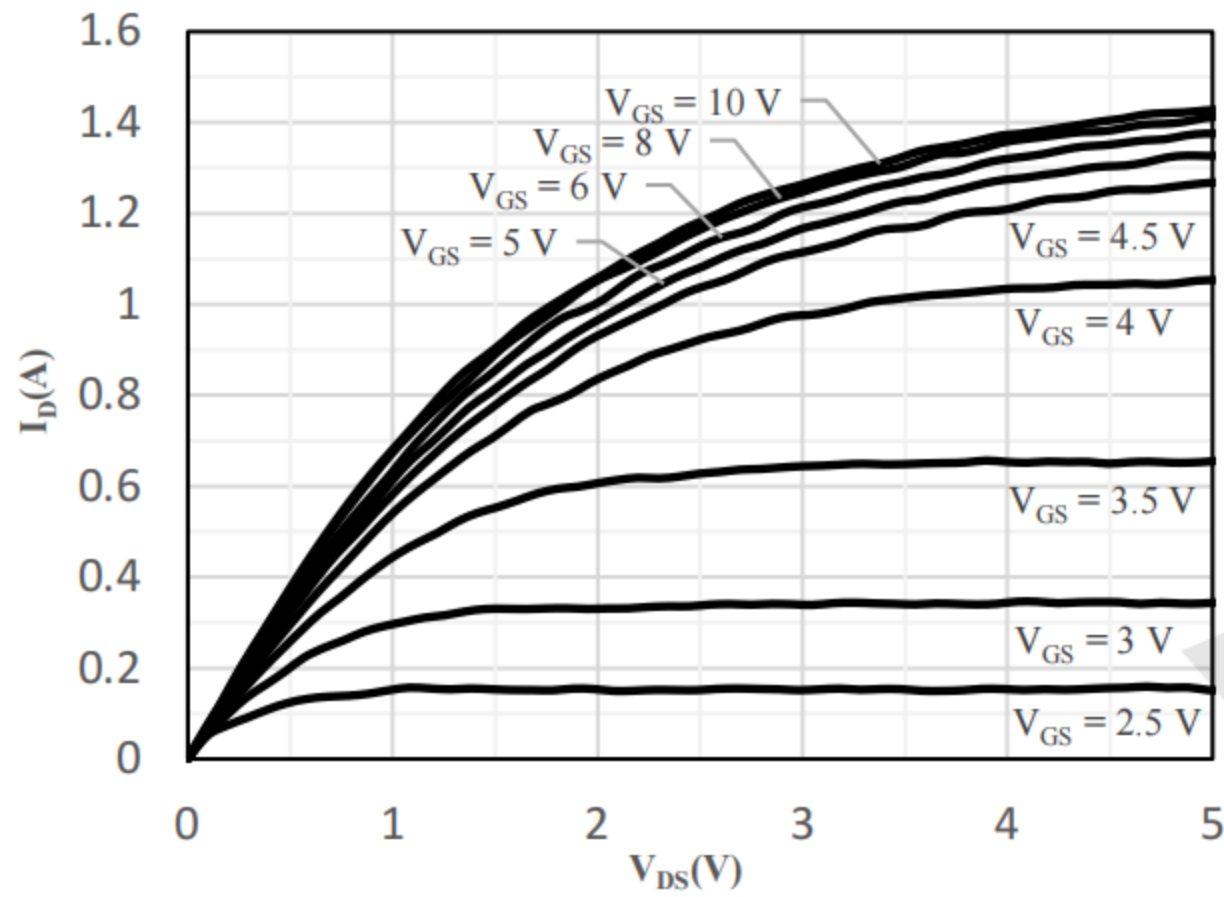


Fig 1 Typical Output Characteristics

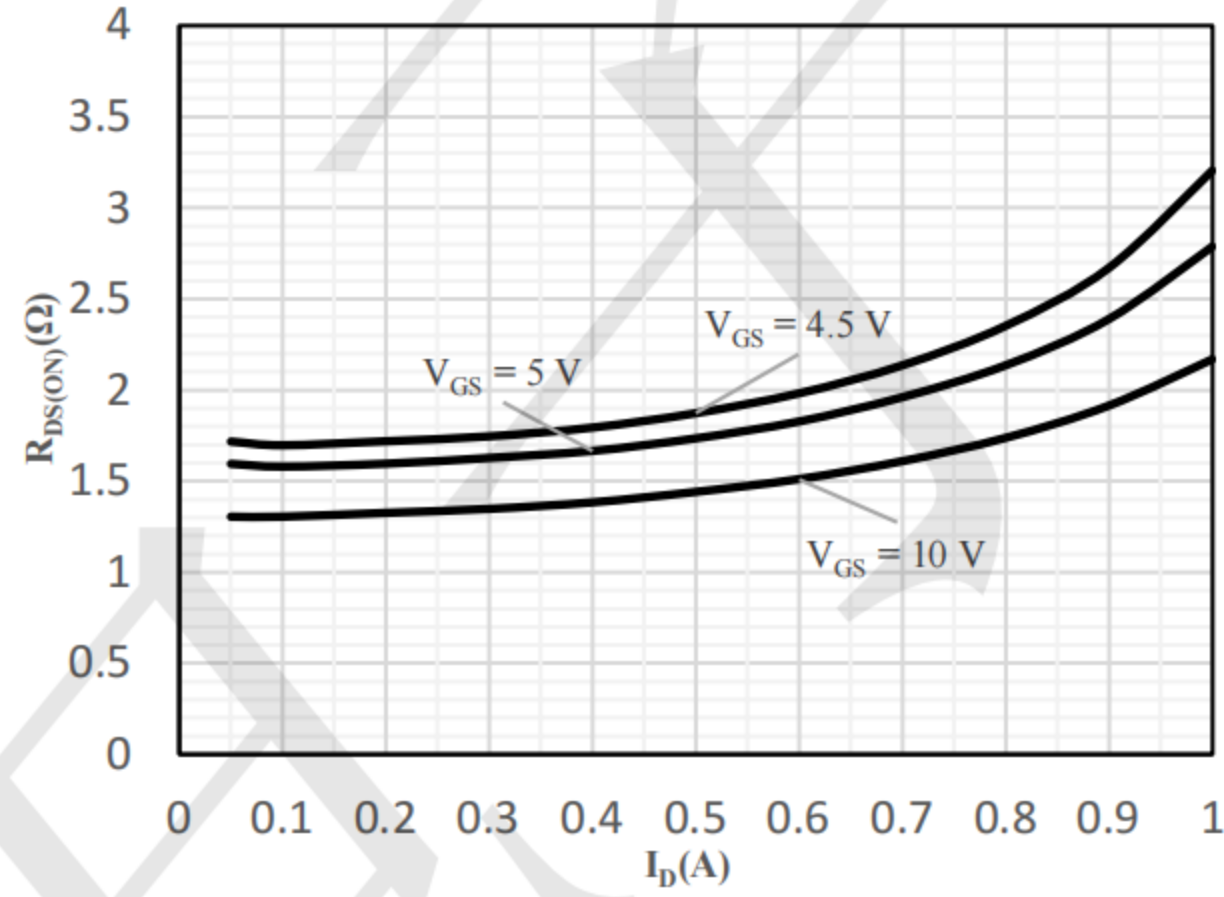


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

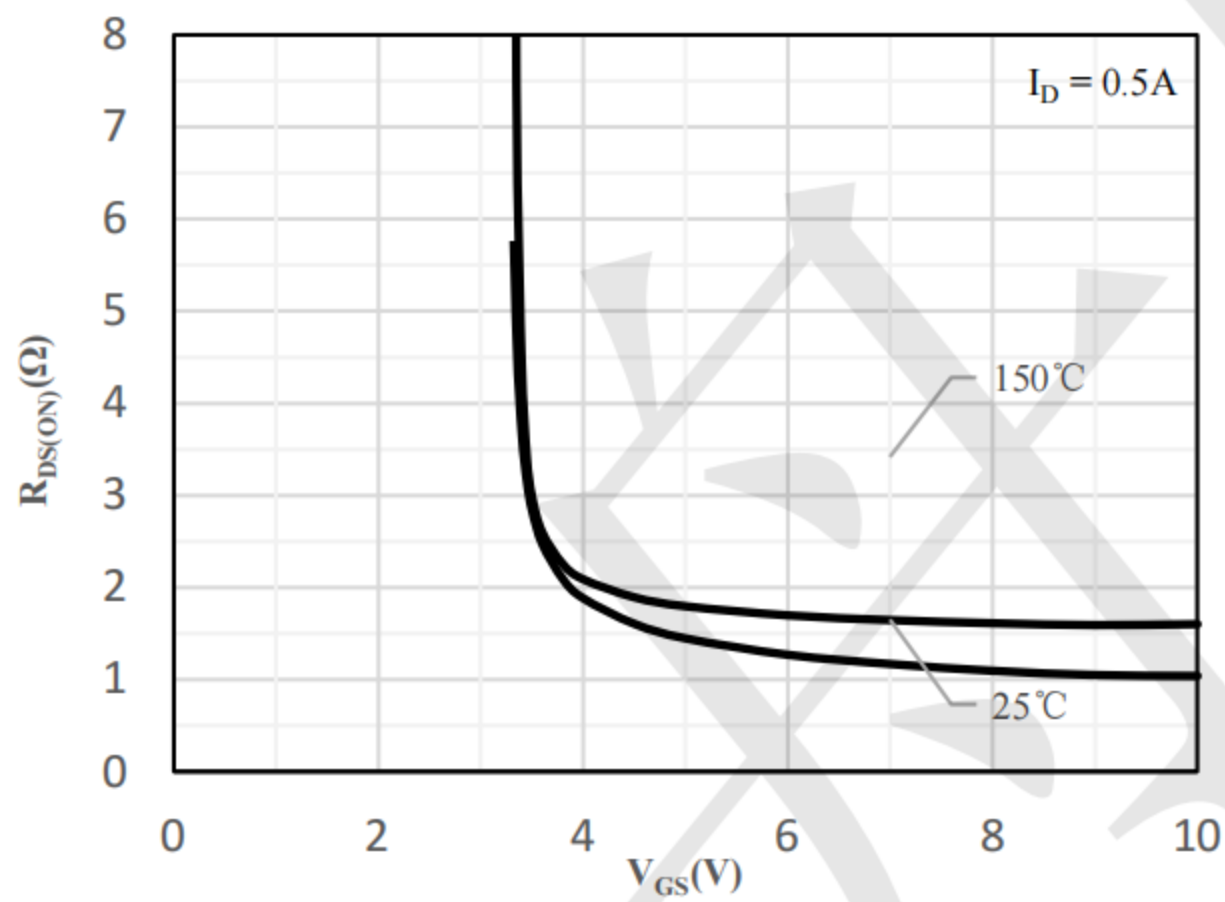


Fig 3 On-Resistance vs. Gate-Source Voltage

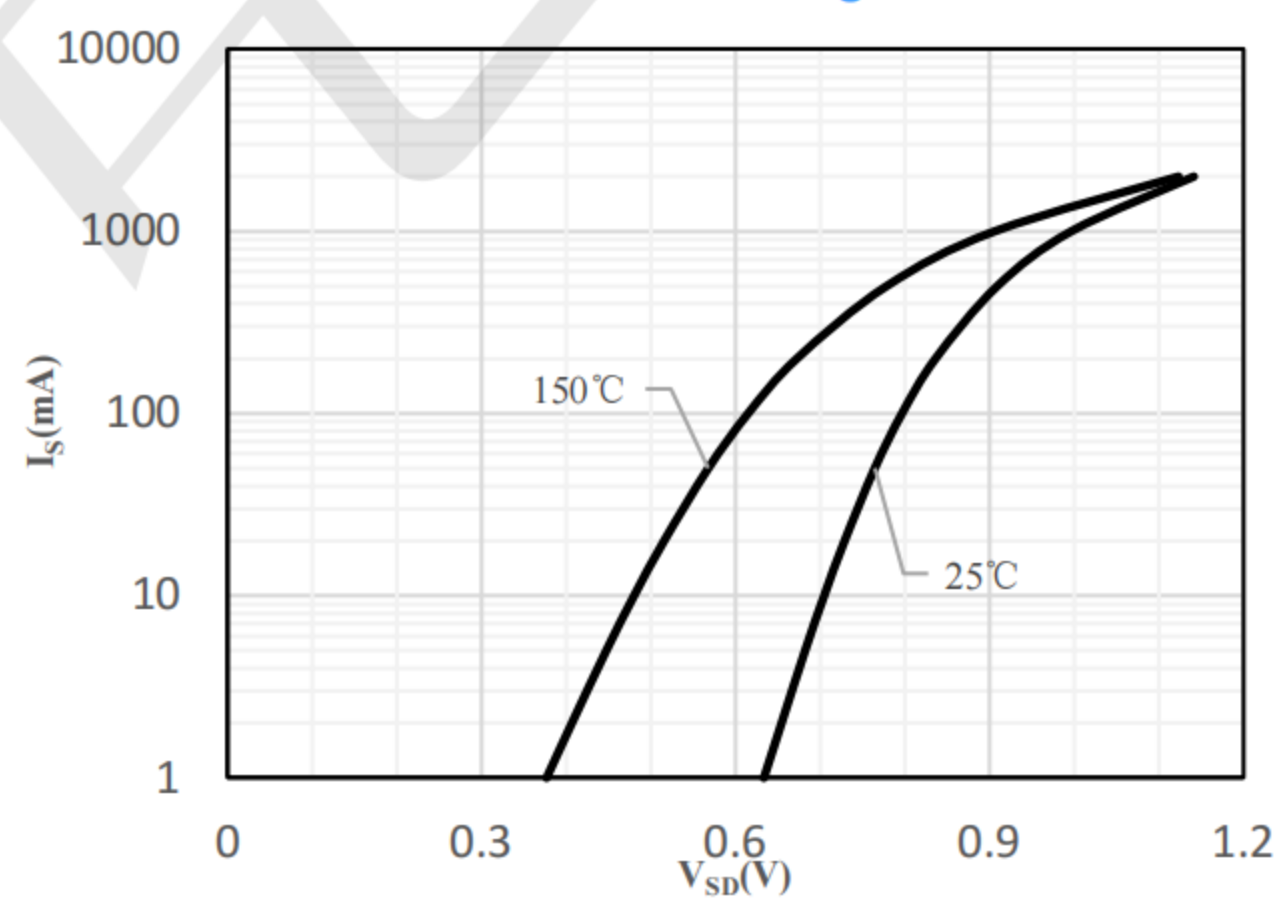


Fig 4 Body-Diode Characteristics

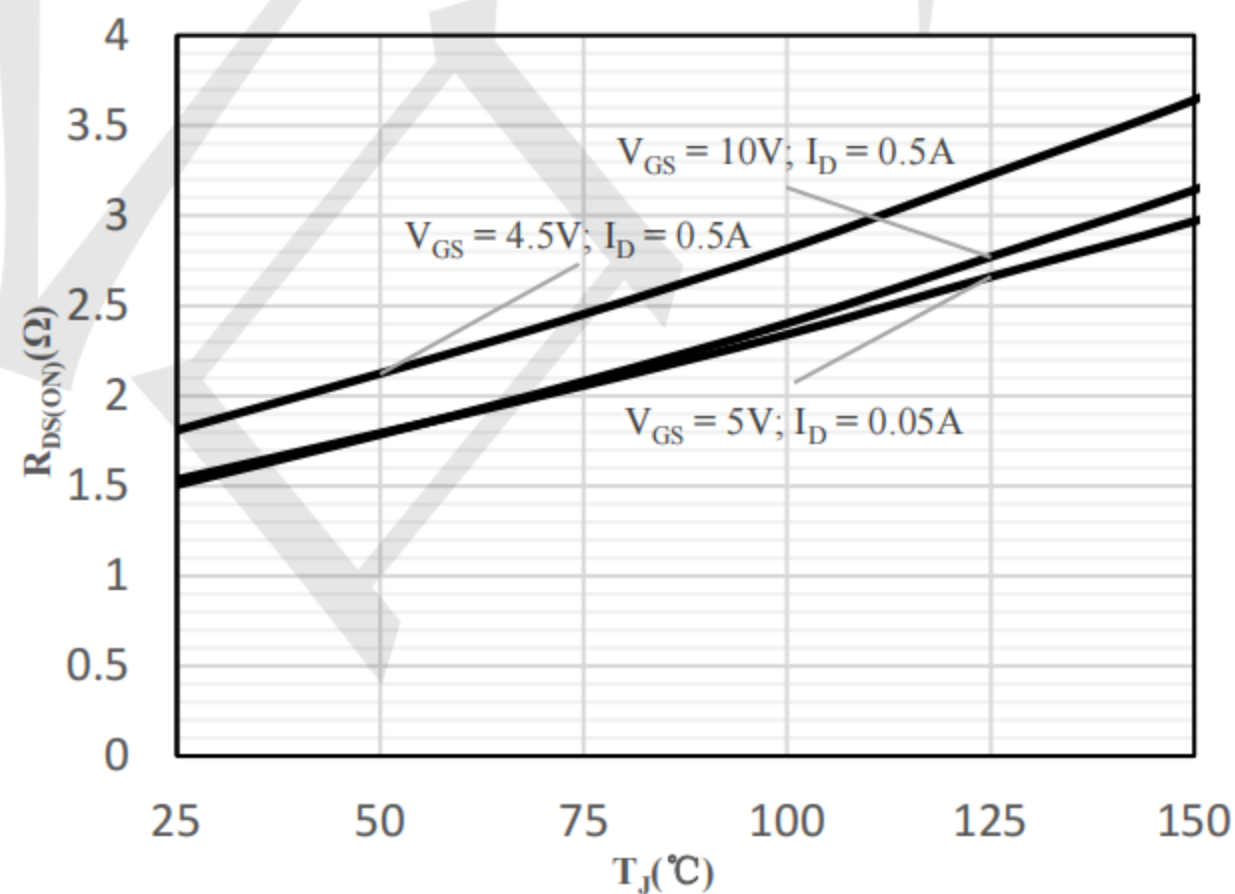


Fig 5 On-Resistance vs. Junction Temperature

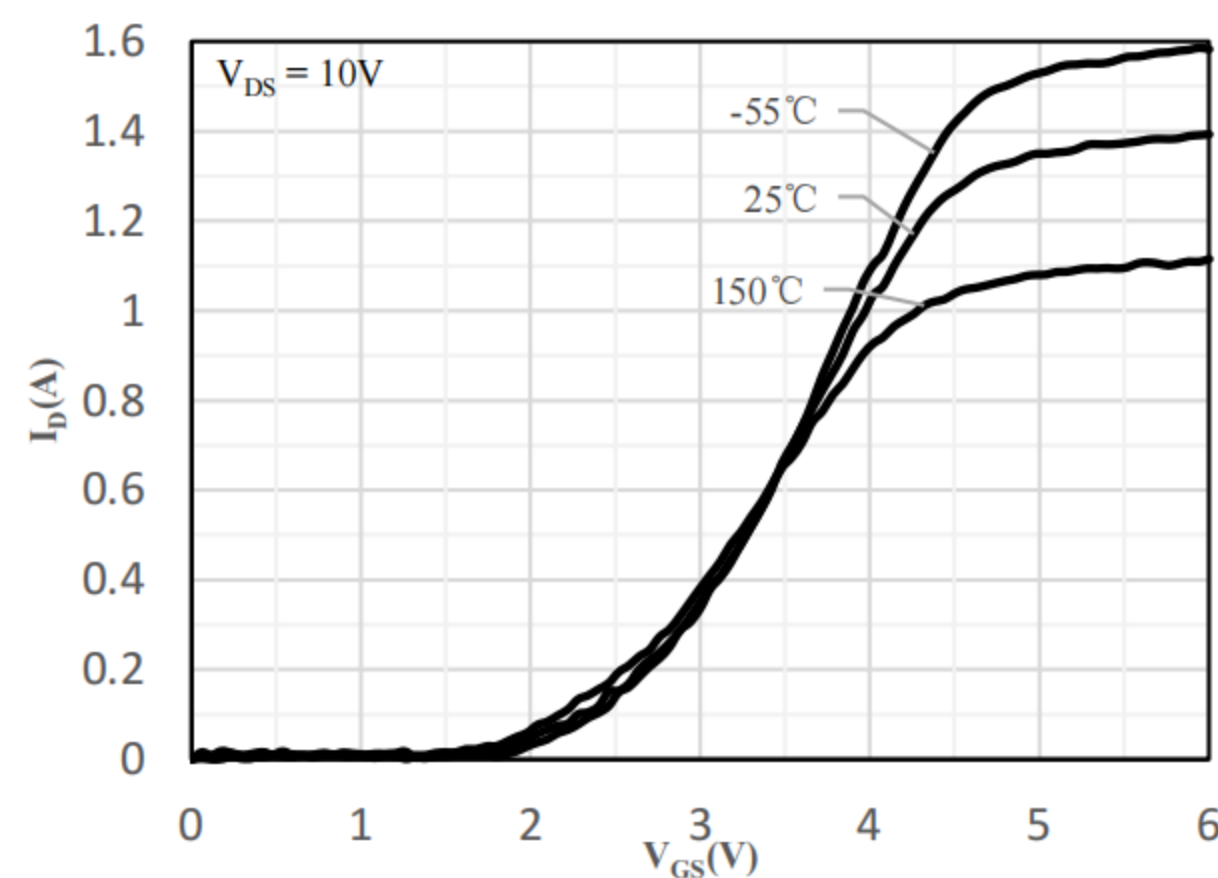


Fig 6 Transfer Characteristics



Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)

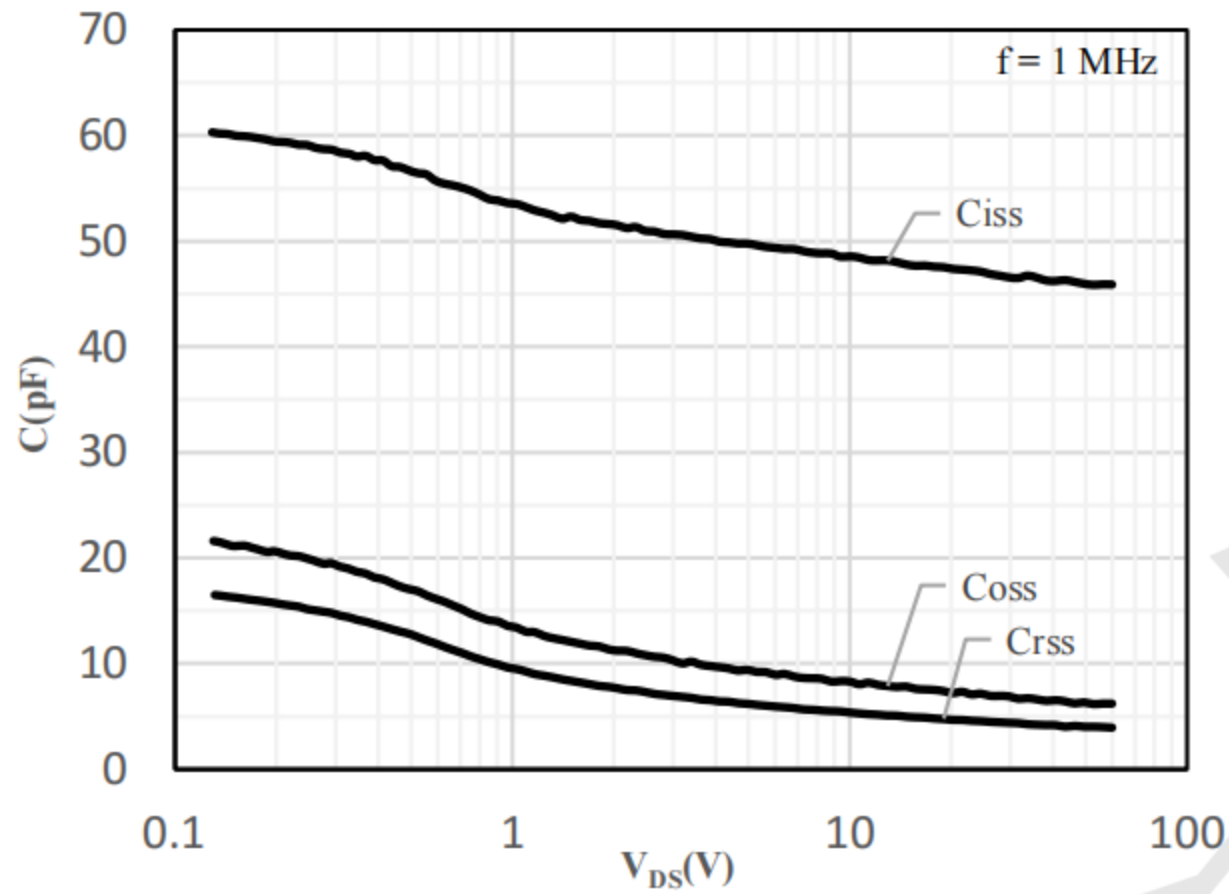


Fig 7 Capacitance Characteristics

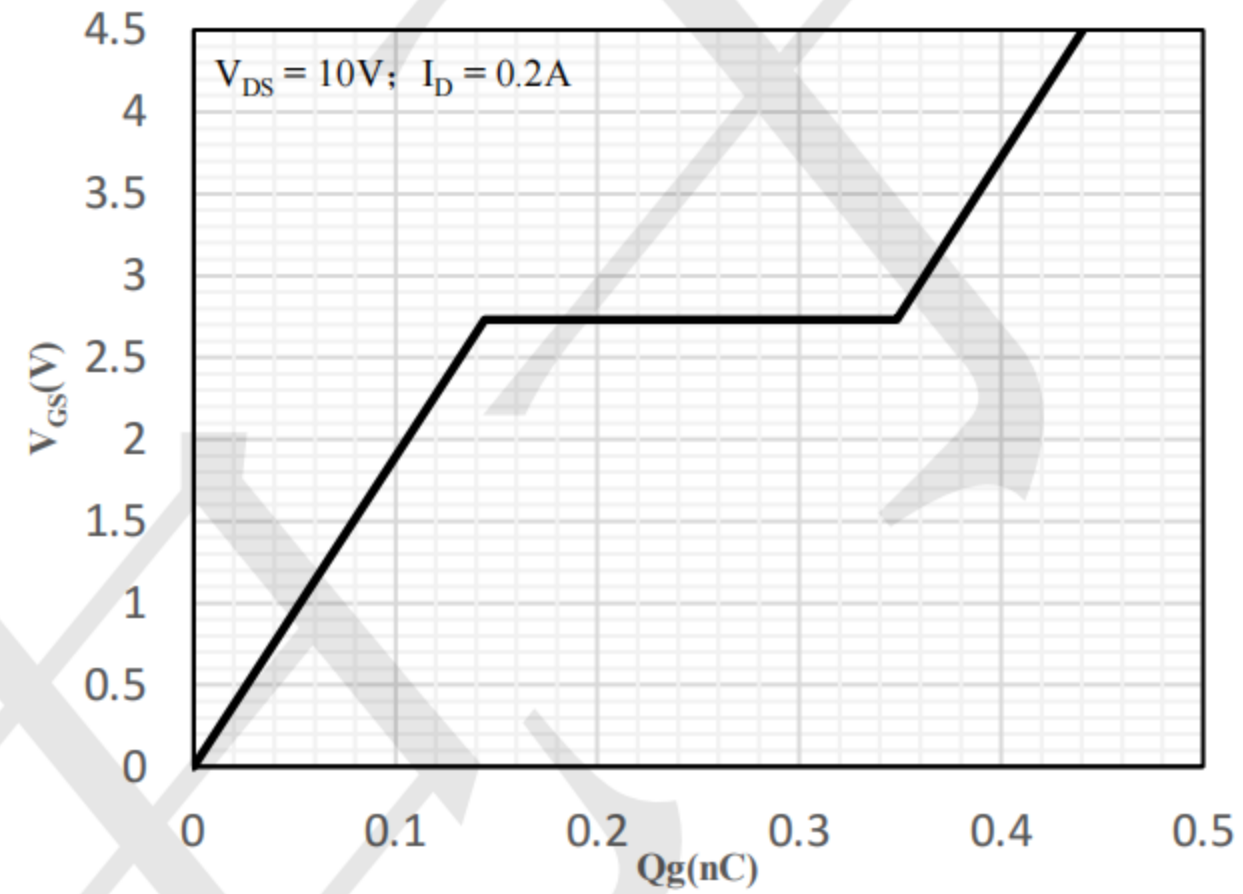


Fig 8 Gate-Charge Characteristics

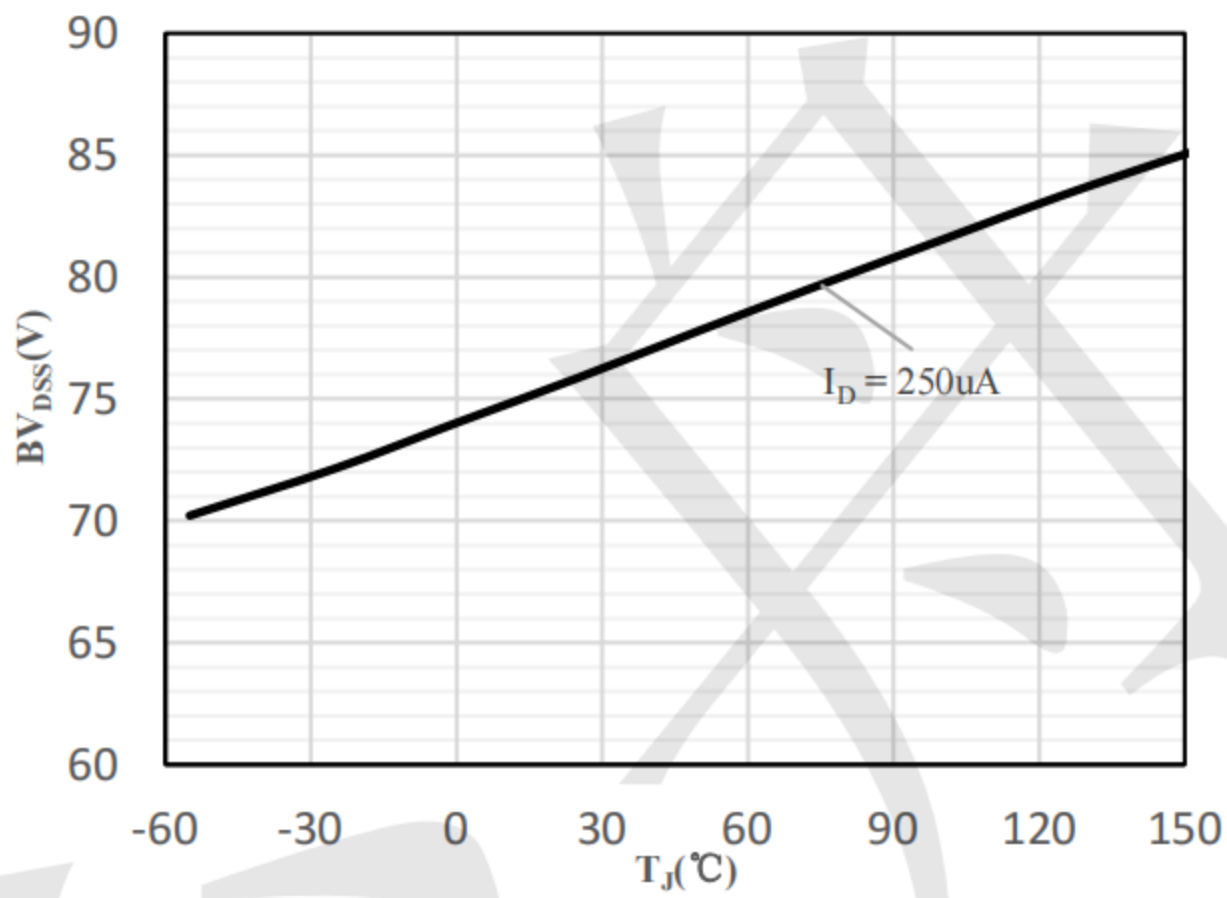


Fig 9 Breakdown Voltage vs. Junction Temperature

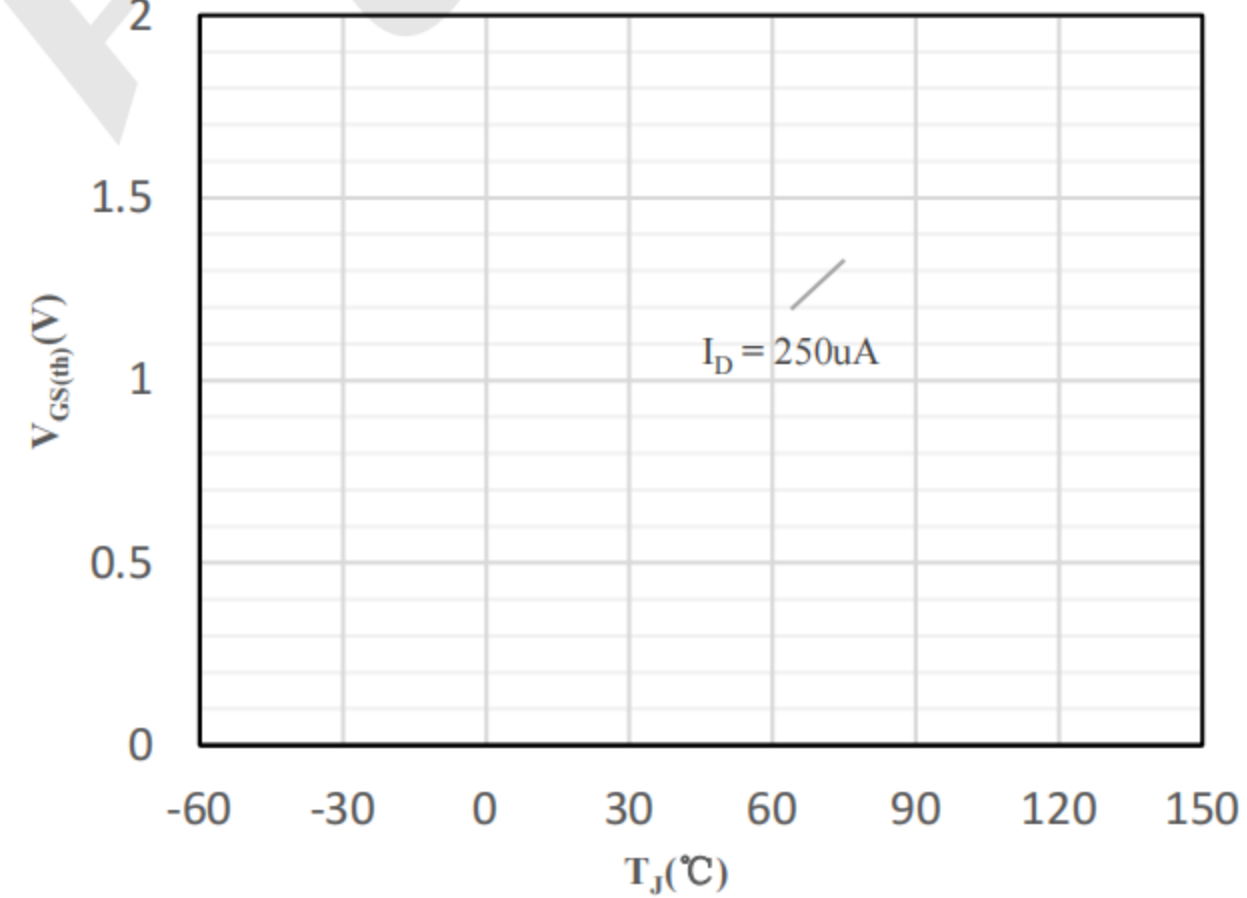
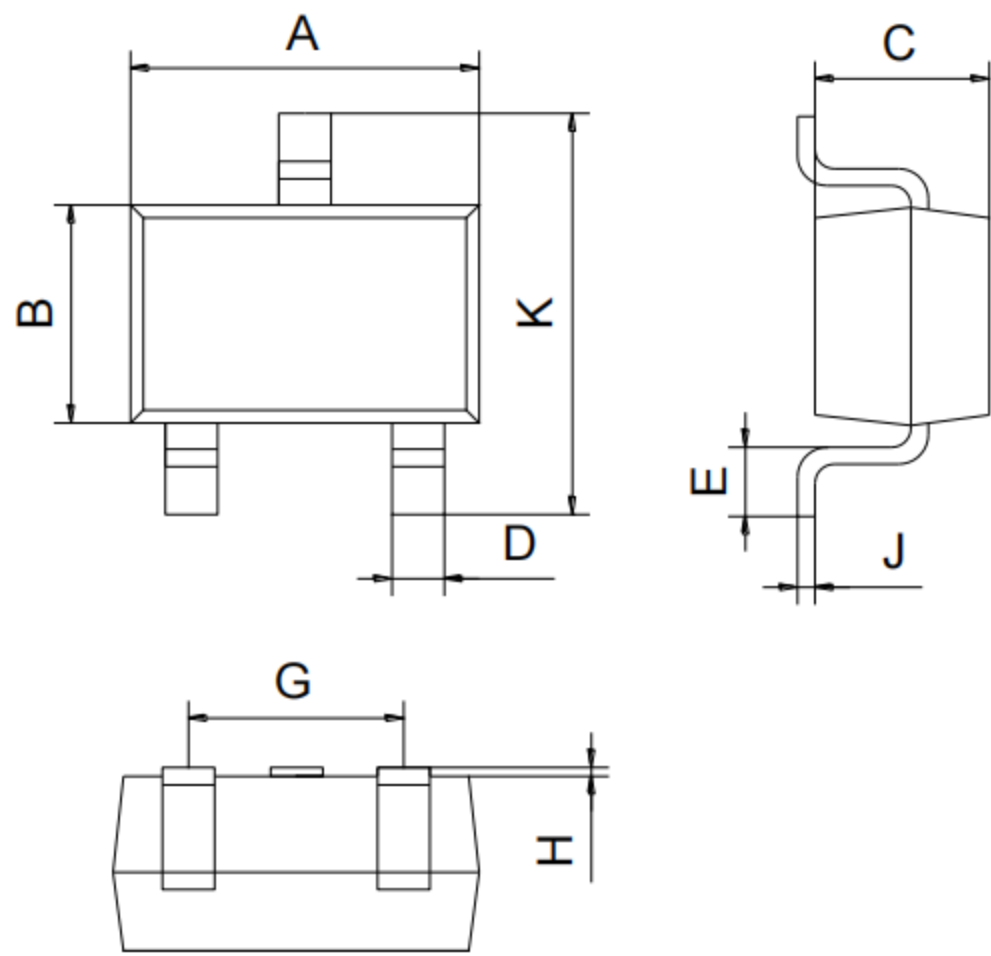


Fig 10  $V_{GS(th)}$  vs. Junction Temperature

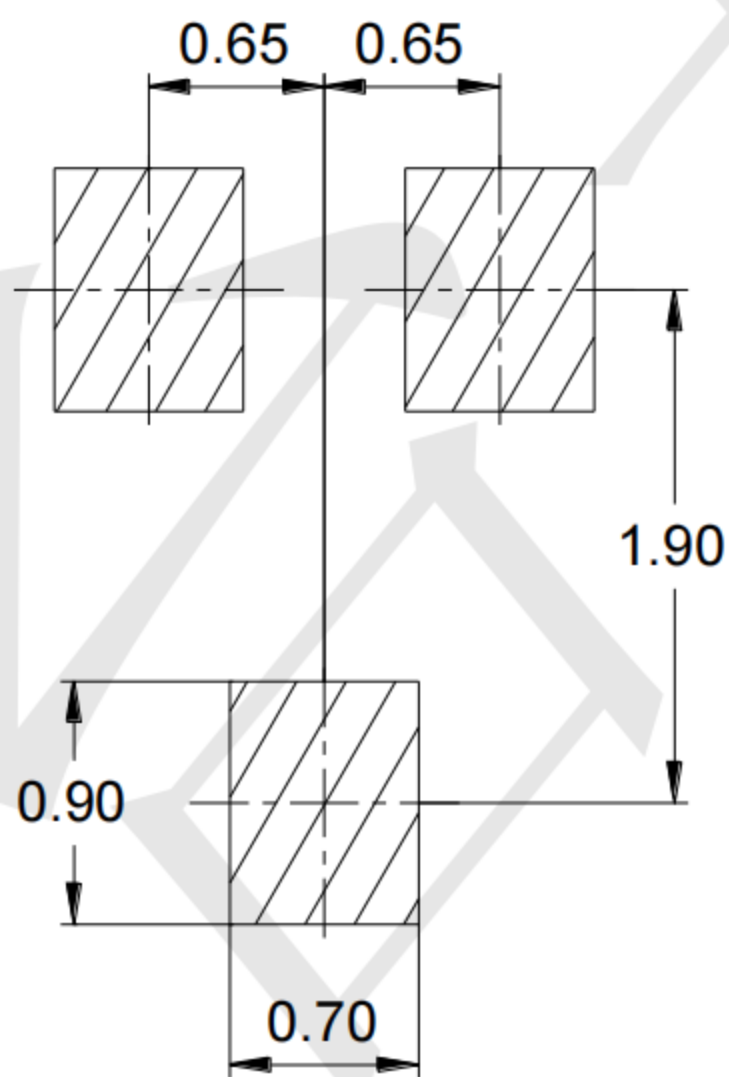


Outline Drawing - SOT323(unit: mm)



SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Mounting Pad Layout-SOT323(unit: mm)



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