

Features

- Low on-resistance
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- JESD22-A114-B: 2

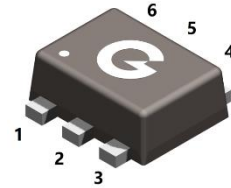
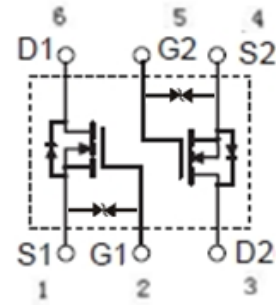
HF

Typical Applications

- N-channel enhancement mode effect transistor
- Switching application

Mechanical Data

- Case: SOT-563
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



SOT-563

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
2N5003V	SOT-563	3000 pcs / Tape & Reel	53

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	50	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current *1	I _D	300	mA
Pulsed Drain Current (t _p = 10μs)	I _{DM}	2000	mA
Power Dissipation (T _A = 25°C) *1	P _D	0.25	W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Air *1	R _{θJA}	-	-	500	°C/W

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

Symbol	Parameter	Test conditions	MIN	TYP	MAX	UNIT
OFF Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	50	-	-	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = 50V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate-body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 10	μA
ON Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance ^{*2}	$V_{GS} = 10V, I_D = 0.5A$	-	1.1	1.5	Ω
		$V_{GS} = 4.5V, I_D = 0.2A$	-	1.2	2.5	
		$V_{GS} = 2.5V, I_D = 0.2A$	-	1.6	2.9	
		$V_{GS} = 1.8V, I_D = 0.05A$	-	2.8	4.0	
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.8	1.0	V
R_G	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	34	-	Ω
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$	-	44	-	pF
C_{OSS}	Output Capacitance	$V_{DS} = 20V$	-	10	-	
C_{RSS}	Reverse Transfer Capacitance	$f = 1.0MHz$	-	7	-	
Switching Characteristics						
$t_{d(on)}$	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	$V_{DD} = 25V$	-	4.3	-	nC
Q_{GS}	Gate to Source Charge	$V_{GS} = 10V$	-	0.7	-	
Q_{GD}	Gate to Drain (Miller) Charge	$I_D = 0.2A$	-	0.5	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage ^{*2}	$I_S = 0.3A, V_{GS} = 0V$	-	0.85	1.2	V

Notes:

1. The data tested by surface mounted on a FR-4 board
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

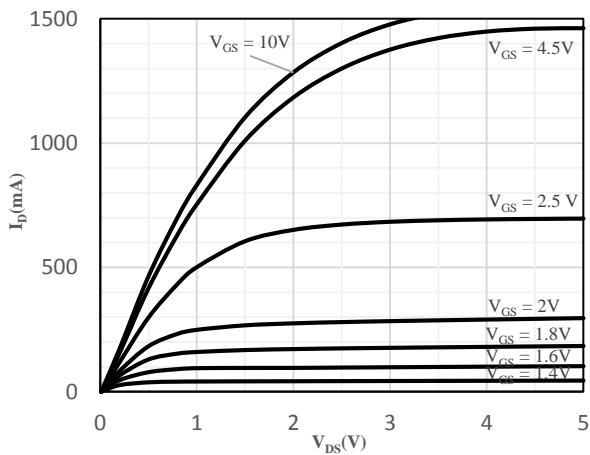


Fig 1 Typical Output Characteristics

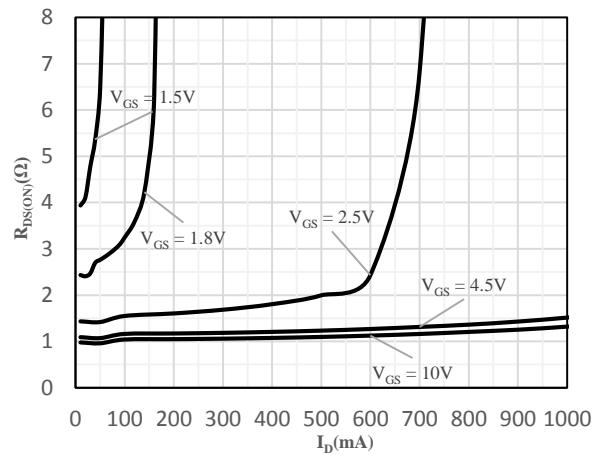


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

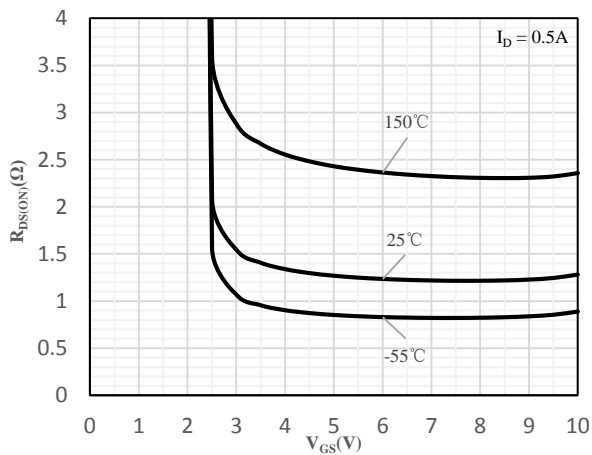


Fig 3 On-Resistance vs. Gate-Source Voltage

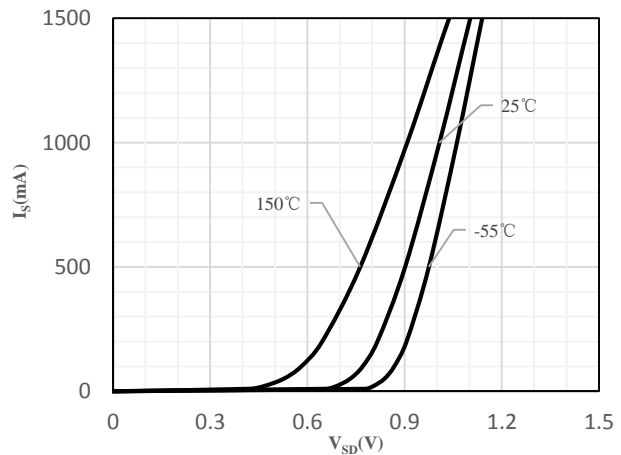


Fig 4 Body-Diode Characteristics

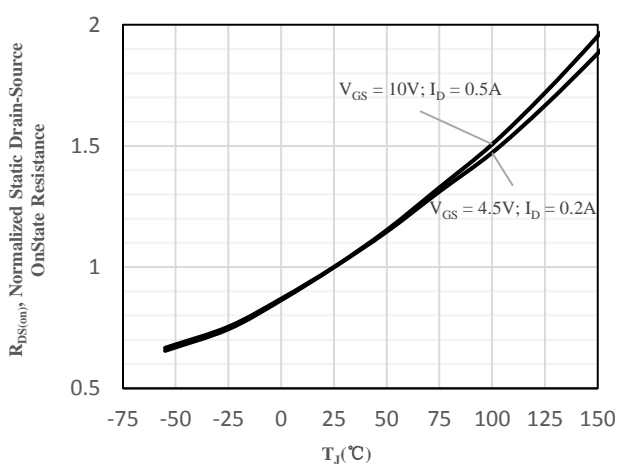


Fig 5 Normalized On-Resistance vs. Junction Temperature

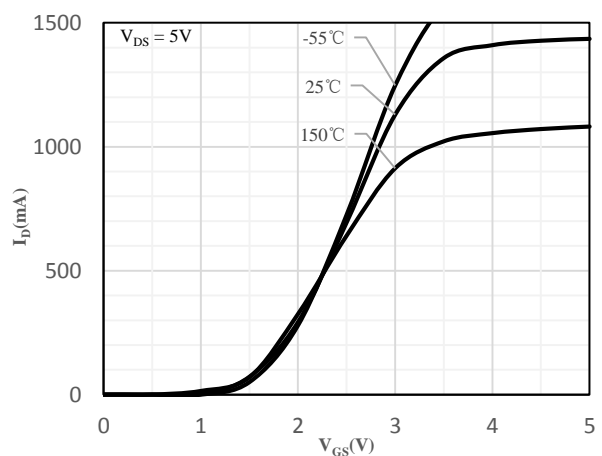


Fig 6 Transfer Characteristics

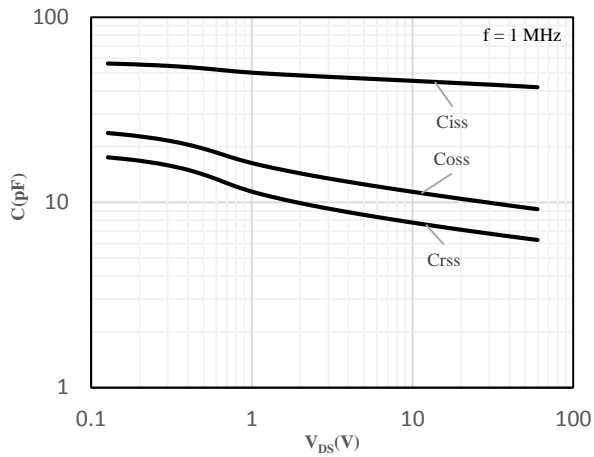


Fig 7 Capacitance Characteristics

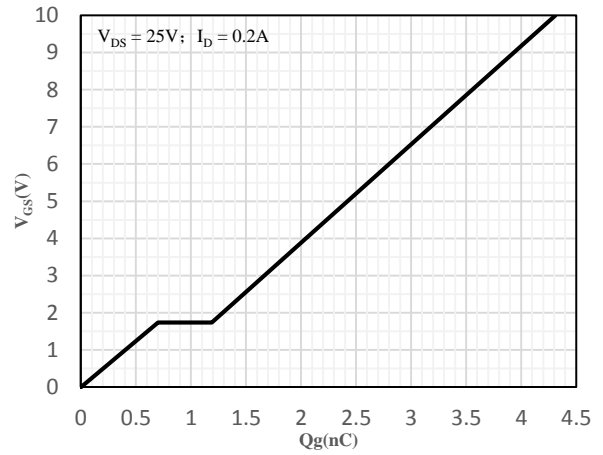


Fig 8 Gate-Charge Characteristics

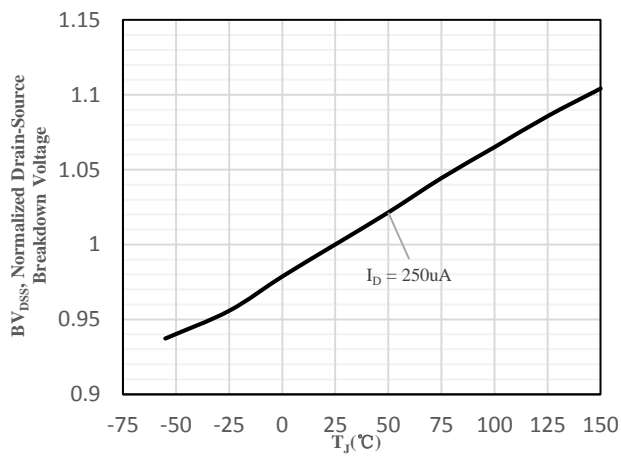


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

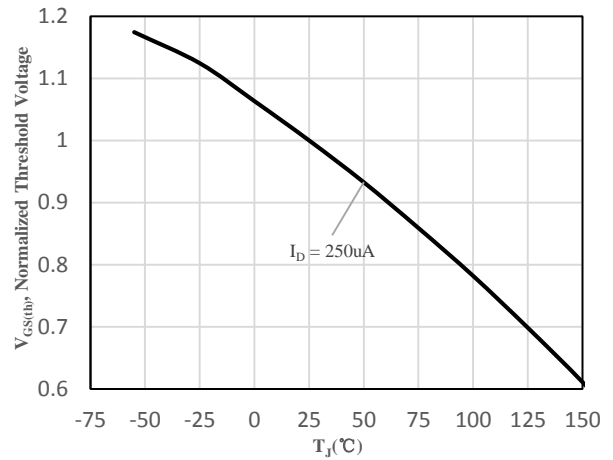
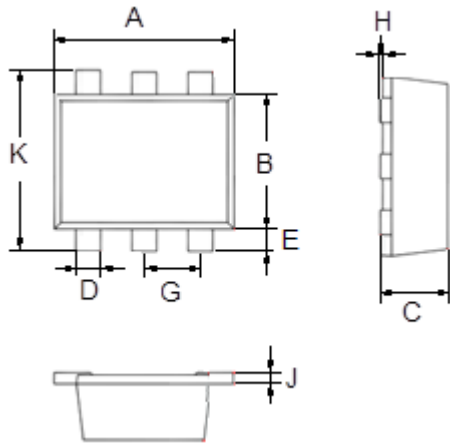


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

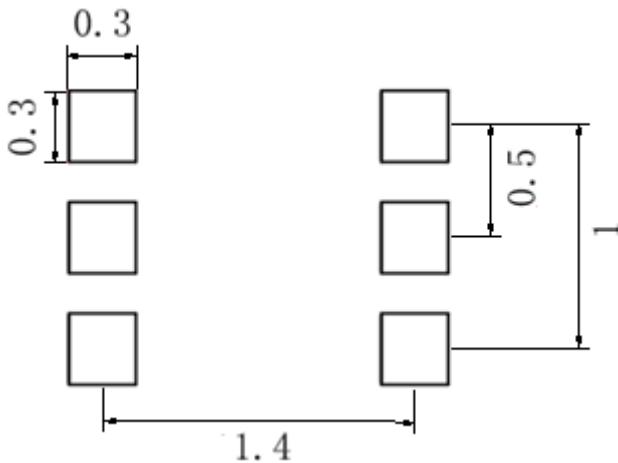
Package Outline Dimensions (Unit: mm)



SOT-563		
Dimension	Min.	Max.
A	1.500	1.700
B	1.100	1.300
C	0.525	0.600
D	0.170	0.270
E	0.100	0.300
G	0.450	0.550
H	0.000	0.050
J	0.090	0.160
K	1.500	1.700

Mounting Pad Layout (Unit: mm)

SOT-563



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