





## N-Channel MOSFET

Drain Source Voltage - 20V  
Continuous Drain Current - 4.5A

### Features

- $V_{DS} = 20V$  ,  $I_D = 4.5A$
- $R_{DS(ON)} < 27\ m\Omega$  @  $V_{GS} = 4.5V$
- Very Low On-Resistance Low  $R_{DS(ON)}$
- Lead Free Product is Acquired
- Fast Switching and Low Crss

### Mechanical Data

- Case: SOT23 Package
  - Case Material: UL Flammability Classification Rating 94V-0
  - Halogen Free
  - Component in Accordance to RoHS
- Note: Products with logo  or  are made by HY Electronic (Cayman) Limited.

### Ordering Information

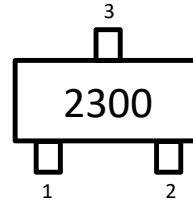
- Package :SOT23
- Reel Size :7 (inches)
- Quantity Per Reel :3,000 pcs
- Quantity One Box :45,000 pcs
- Quantity One Carton :180,000 pcs

### Package Outline



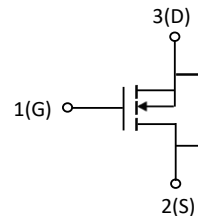
SOT23 Top View

### Marking Information



"2300" = Product Type Marking Code

### Device Schematic & PIN Configuration



### Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	4.5	A
	$T_C = 70^\circ\text{C}$	3.4	A
Pulsed Drain Current (*)	$I_{DM}$	12.9	A
Power Dissipation	$T_C = 25^\circ\text{C}$	1.38	W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	90.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	- 55 to 150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	$T_L$	300	$^\circ\text{C}$

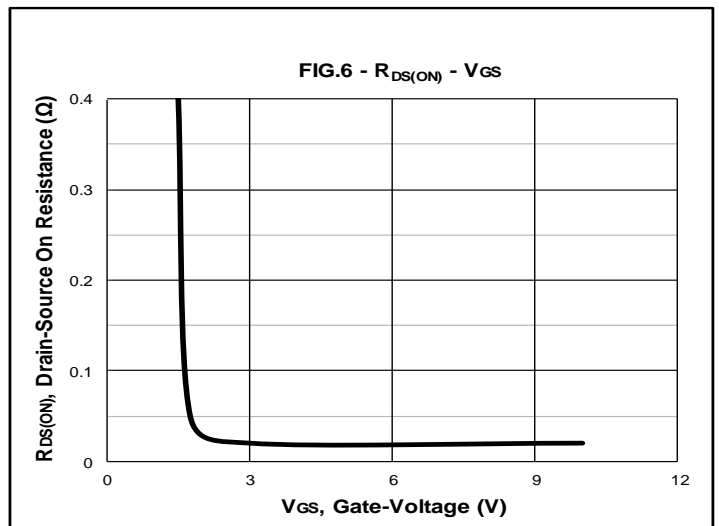
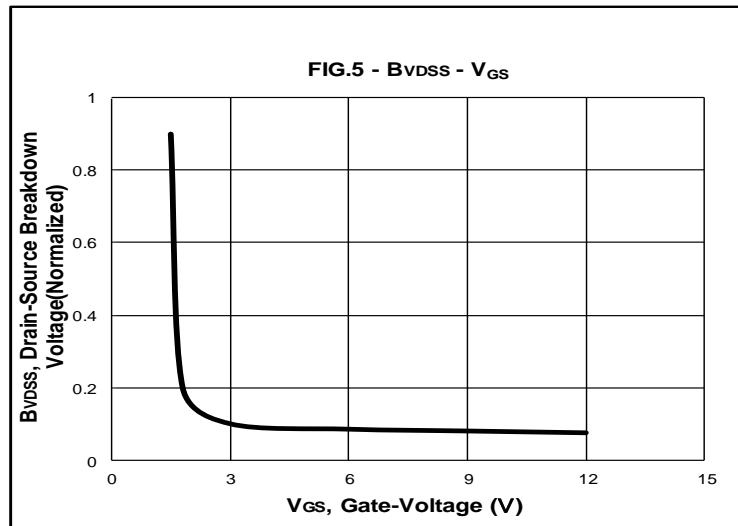
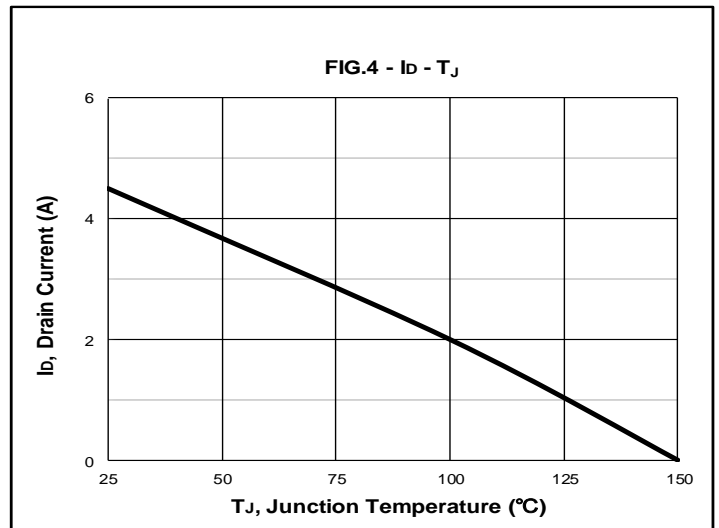
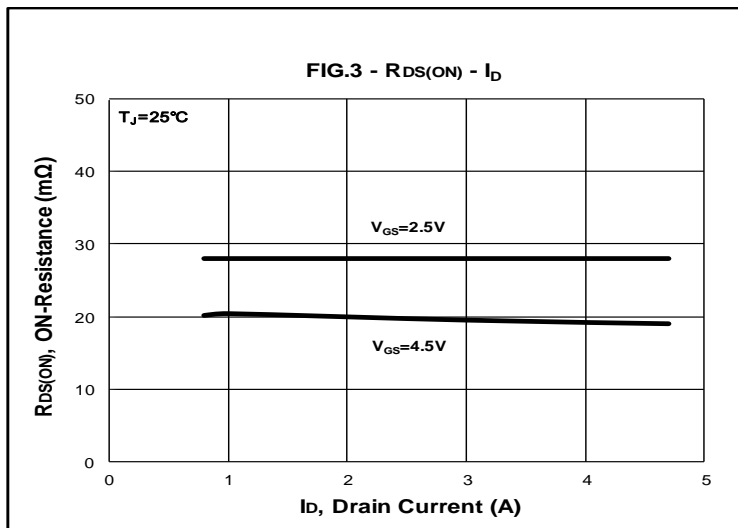
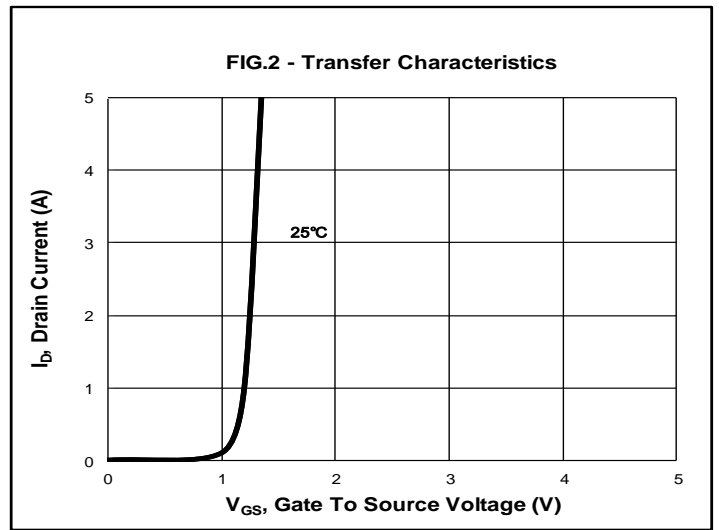
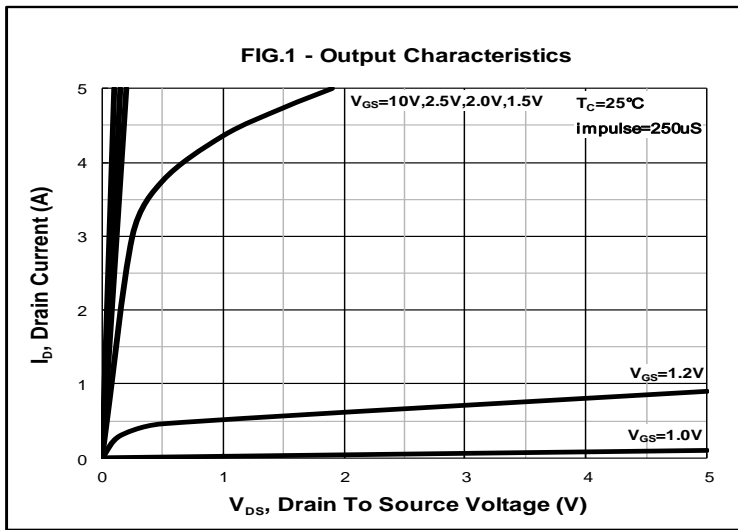
Notes : Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature.

Electrical Characteristics(@T<sub>J</sub> = +25°C, unless otherwise specified.)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	BV <sub>DSS</sub>	20	-	-	V
Gate-Body Leakage Current, Forward	V <sub>GS</sub> =10V, V <sub>DS</sub> =0V	I <sub>GSSF</sub>	-	-	100	nA
Gate-Body Leakage Current, Reverse	V <sub>GS</sub> =-10V, V <sub>DS</sub> =0V	I <sub>GSSR</sub>	-	-	-100	nA
Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	I <sub>DSS</sub>	-	-	1	μA
	V <sub>DS</sub> =16V, T <sub>C</sub> =125°C		-	-	10	μA
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	V <sub>GS(th)</sub>	0.45	-	1.1	V
Static Drain-Source	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.3A		-	19	27	mΩ
On-Resistance	V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.0A	R <sub>DS(on)</sub>	-	26	38	
<b>Dynamic Characteristics</b>						
Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, F=1MHz	C <sub>iss</sub>	-	354	-	pF
Output Capacitance		C <sub>oss</sub>	-	71	-	
Reverse Transfer Capacitance		C <sub>rss</sub>	-	67	-	
<b>Switching Characteristics</b>						
Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =5V, I <sub>D</sub> =4.3A	Q <sub>g</sub>	-	4.4	-	nC
Gate Source Charge		Q <sub>gs</sub>	-	0.6	-	
Gate Drain Charge		Q <sub>gd</sub>	-	1.9	-	
Turn-On Delay Time	V <sub>DS</sub> =10V, V <sub>GS</sub> =5V, I <sub>D</sub> =4.3A, R <sub>G</sub> =6Ω, R <sub>L</sub> =2.7Ω	t <sub>d(on)</sub>	-	5.2	-	ns
Turn-On Rise Time		t <sub>r</sub>	-	37	-	
Turn-Off Delay Time		t <sub>d(off)</sub>	-	15	-	
Turn-Off Fall Time		t <sub>f</sub>	-	5.7	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Maximum Continuous Drain-Source Diode Forward Current		I <sub>S</sub>	-	-	4.5	A
Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>	-	-	12.9	A
Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>SD</sub> =4.3A, T <sub>J</sub> =25°C	V <sub>SD</sub>	-	-	1.2	V



## Rating and Characteristic Curves





## Rating and Characteristic Curves

FIG.7 - Capacitance Characteristics

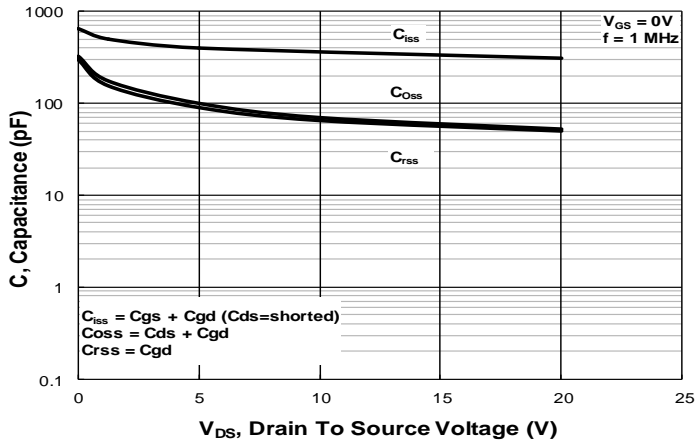


FIG.8 - Gate Charge Characteristics

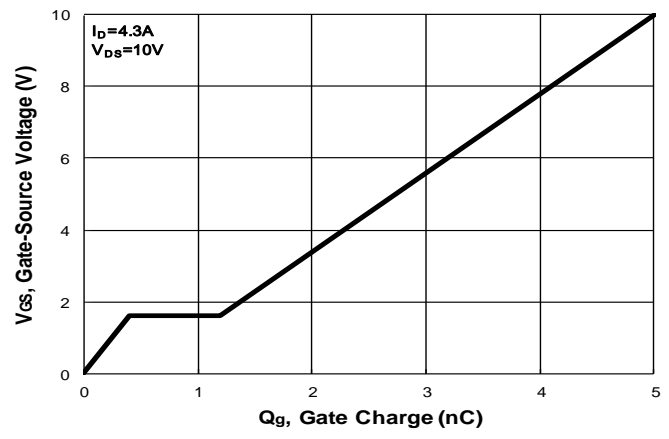


FIG.9 - Body Diode Characteristics

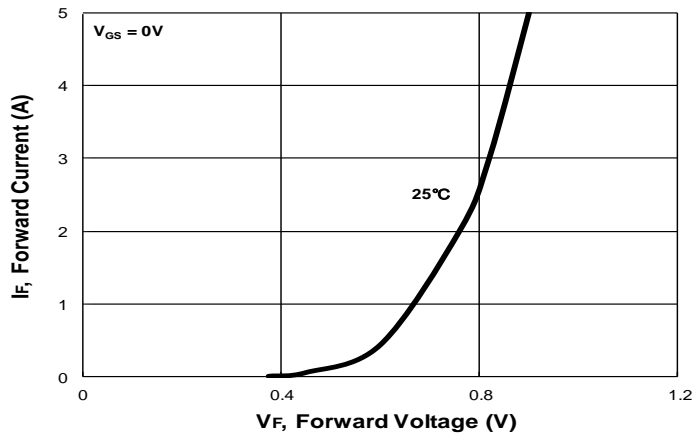
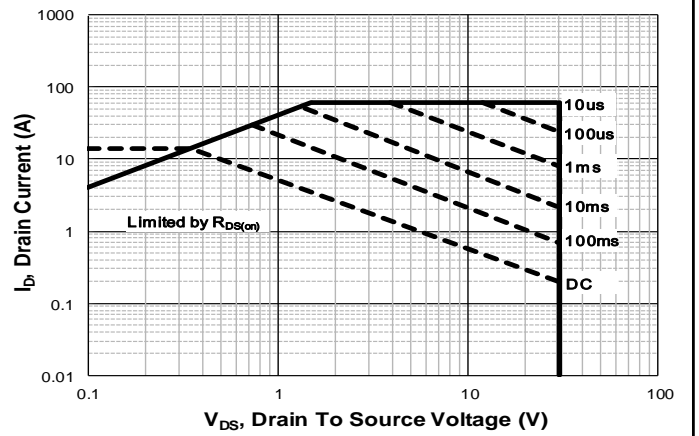
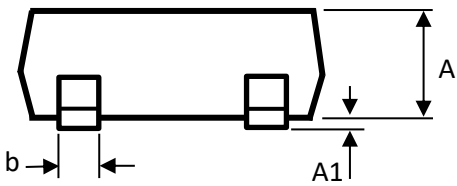
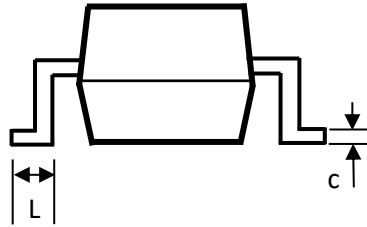
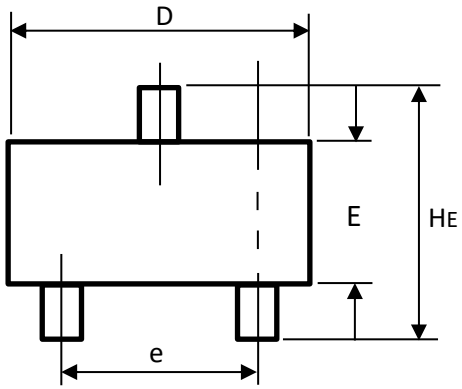


FIG.10 - Maximum Safe Operating Area





## Package Outline Dimensions



SOT23 Package		
Dim	Min	Max
A	0.87	1.07
A1	0.00	0.10
b	0.30	0.50
c	0.09	0.15
D	2.80	3.00
E	1.20	1.60
e	1.80	2.00
L	0.20	0.45
HE	2.25	2.55
All Dimensions in mm		



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