

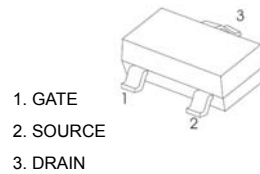
## DESCRIPTION

- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- TrenchFET Power MOSFET

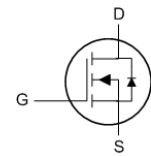
$V_{DSS}$  20 V  
 $I_D$  6.0 A  
 $R_{DS(ON)}$  23 m  $\Omega$



### SOT-23



### Equivalent Circuit



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8.0$	
Continuous Drain Current	$I_D$	6	A
Pulsed Drain Current	$I_{DM}$	20	
Continuous Source-Drain Diode Current	$I_S$	1.04	
Maximum Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-50 ~ +150	

$T_a=25^\circ\text{C}$  unless otherwise specified

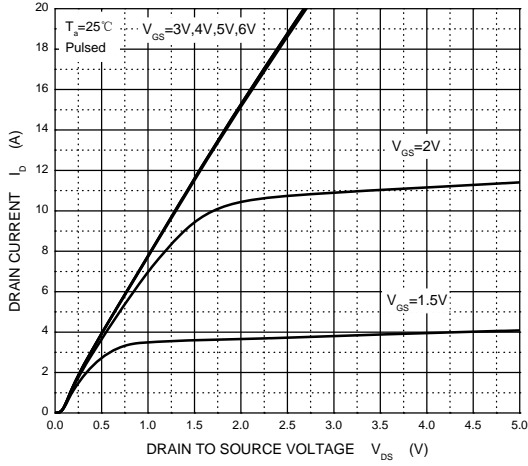
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Gate-source leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 8V$			$\pm 100$	nA
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1.0	$\mu A$
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.7	1.0	V
Drain-source on-state resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 5.0A$		0.013	0.023	$\Omega$
		$V_{GS} = 2.5V, I_D = 4.7A$		0.023	0.028	
		$V_{GS} = 1.8V, I_D = 4.3A$		0.030	0.04	
Forward transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10V, I_D = 5.0A$		6		S
<b>Dynamic<sup>b</sup></b>						
Input capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		865		pF
Output capacitance	$C_{oss}$			105		
Reverse transfer capacitance	$C_{rss}$			55		
Gate resistance	$R_g$	$f = 1MHz$	0.5		4.8	$\Omega$
Turn-on delay Time	$t_{d(on)}$	$V_{GEN} = 5V, V_{DD} = 10V,$ $I_D = 4A, R_G = 1\Omega, R_L = 2.2\Omega$			10	ns
Rise time	$t_r$				20	
Turn-off Delay time	$t_{d(off)}$				32	
Fall time	$t_f$				12	
<b>Drain-source body diode characteristics</b>						
Forward diode voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 4A$		0.75	1.2	V

**Notes :**

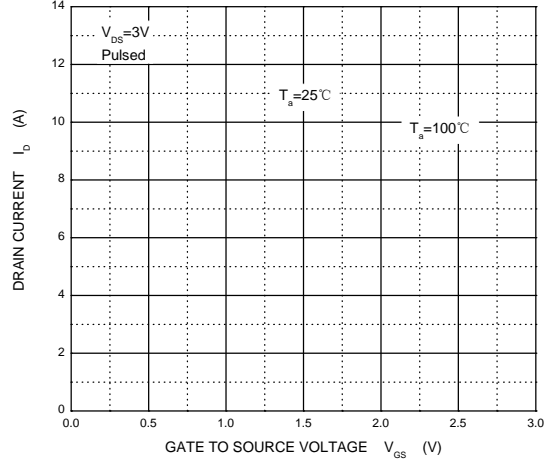
- Pulse Test : pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES

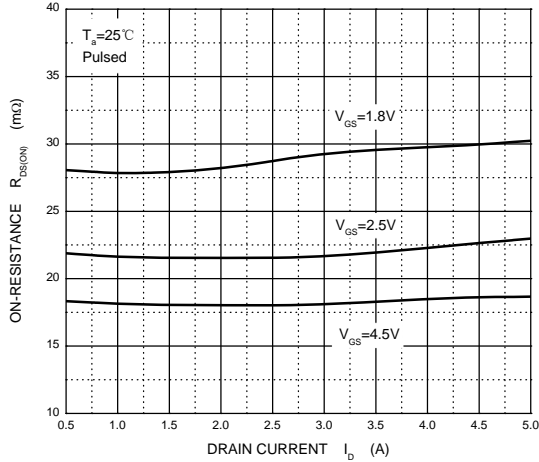
Output Characteristics



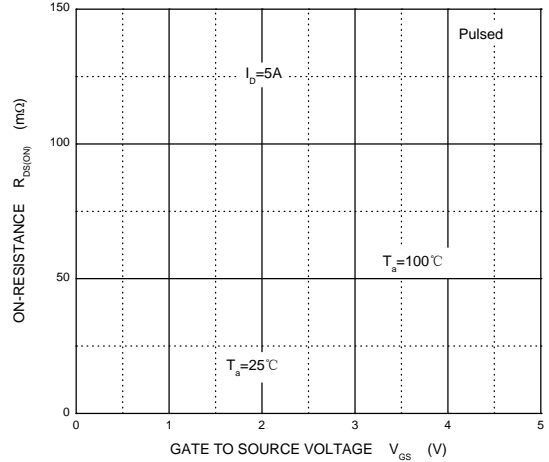
Transfer Characteristics



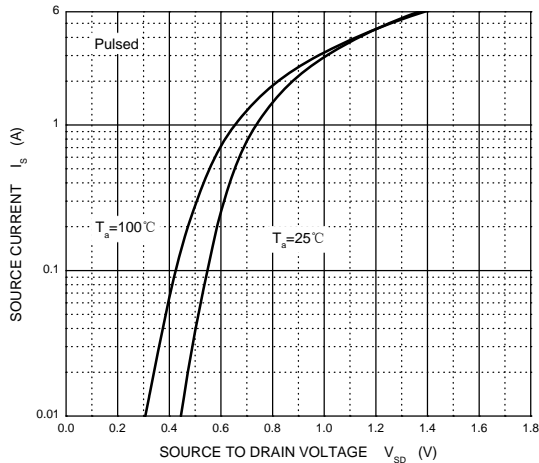
$R_{DS(ON)}$  —  $I_D$



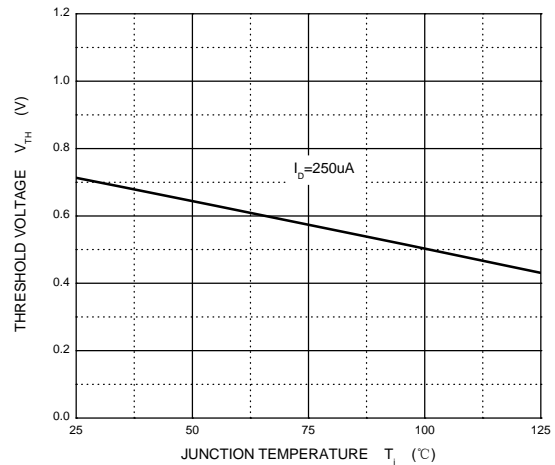
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$



Threshold Voltage



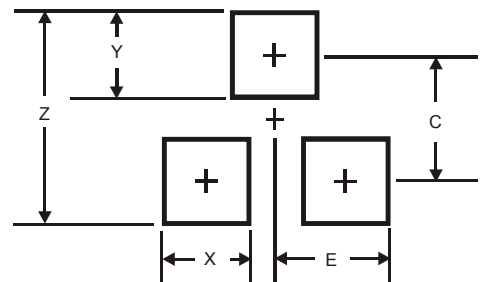
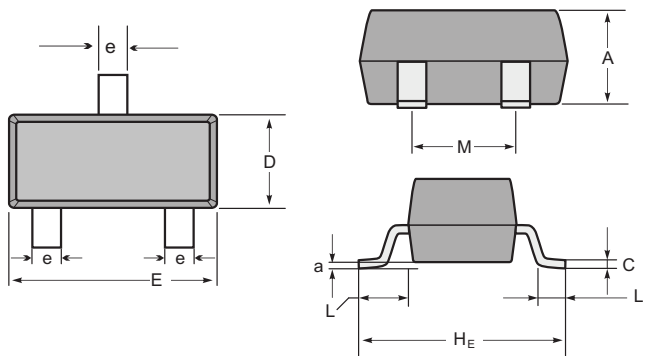
**Soldering parameters**

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C



**Package Dimensions & Suggested Pad Layout**

**SOT23**



**SOT-23 mechanical data**

UNIT	A	C	D	E	HE	e	M	L	L1	a	
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Tape & reel specification

Tape		Symbol	Dimension (mm)		
		P0	4.00±0.10		
		P1	4.00±0.10		
		P2	2.00±0.10		
		D0	1.55±0.10		
		D1	1.05±0.10		
		E	1.55±0.10		
		F	3.60±0.10		
		W	8.00±0.10		
		A0	3.80±0.20		
		B0	3.25±0.20		
		K0	1.45±0.10		
		T	0.25±0.05		
		7" Reel		D2	178.0±3.0
				D3	55Min.
D4	R24.0±3.0				
G	R82.0±3.0				
I	13.0±2.0				
W1	11.0±3.0				
Quantity: 3000PCS					