

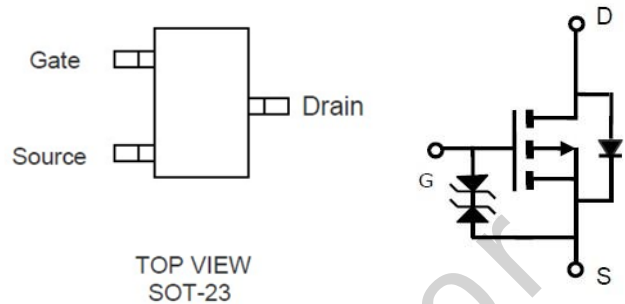
■ DESCRIPTION

The SI2301BDS-T1-GE3 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology..

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.

ESD Protected : 3KV

■ PIN CONFIGURATION



■ FEATURE

- ◆ -20V/-4.3A, $R_{DS(ON)}=34m\Omega$ (typ.)@ $V_{GS}=-4.5V$
- ◆ -20V/-3.0A, $R_{DS(ON)}=44m\Omega$ (typ.)@ $V_{GS}=-2.5V$
- ◆ -20V/-2.0A, $R_{DS(ON)}=56m\Omega$ (typ.)@ $V_{GS}=-1.8V$
- ◆ -20V/-1.0A, $R_{DS(ON)}=85m\Omega$ (typ.)@ $V_{GS}=-1.5V$
- ◆ Super high design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ Full RoHS compliance
- ◆ SOT23-3Lpackage design

■ APPLICATIONS

- ◆ Power Management
- ◆ Portable Equipment
- ◆ DC/DC Converter
- ◆ Load Switch
- ◆ DSC
- ◆ LCD Display inverter

■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Typical	Unit
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 8	V
I_D	Continuous Drain Current ($T_C=25^\circ\text{C}$)	$V_{GS}=-10\text{V}$	A
	Continuous Drain Current ($T_C=70^\circ\text{C}$)		
I_{DM}	Pulsed Drain Current	-20	A
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	W
		$T_A=70^\circ\text{C}$	
T_J	Operation Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55~+150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	120	$^\circ\text{C/W}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress rating only and functional device operation is not implied

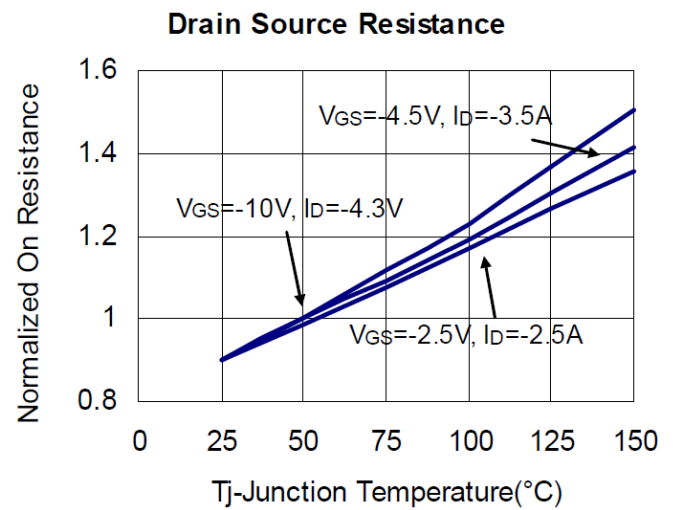
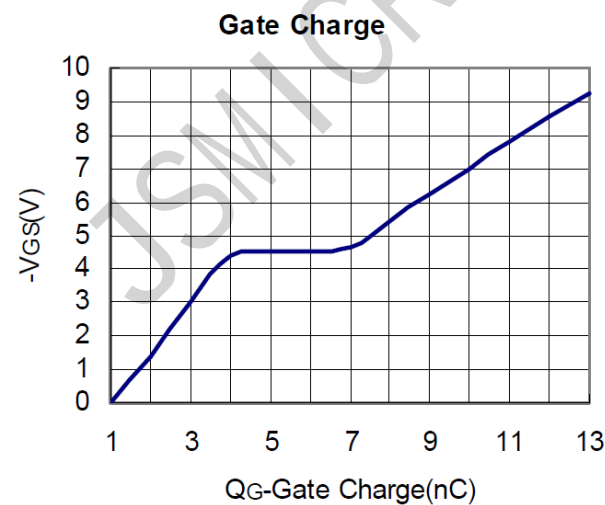
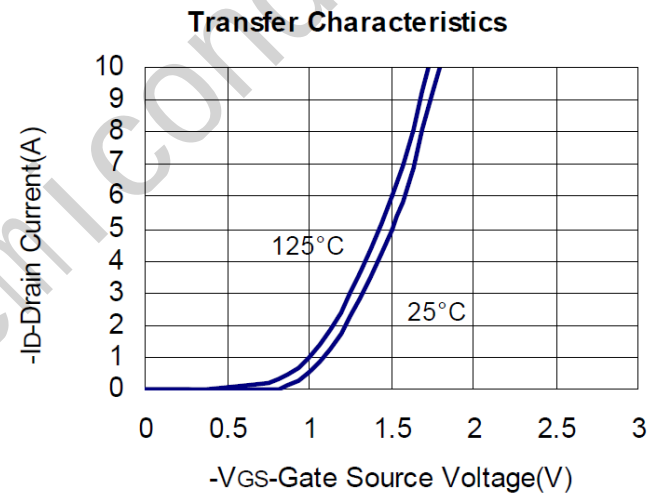
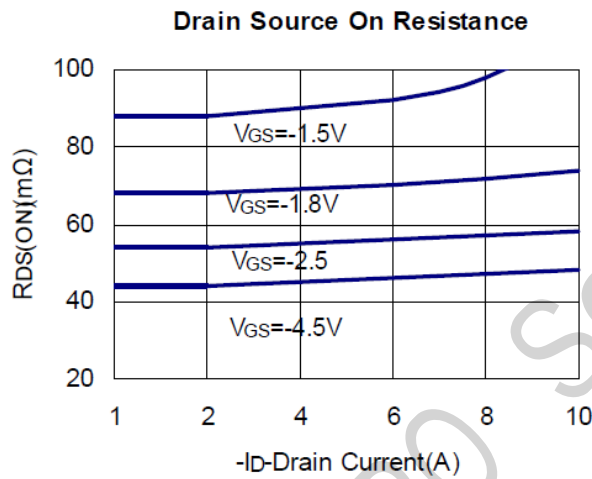
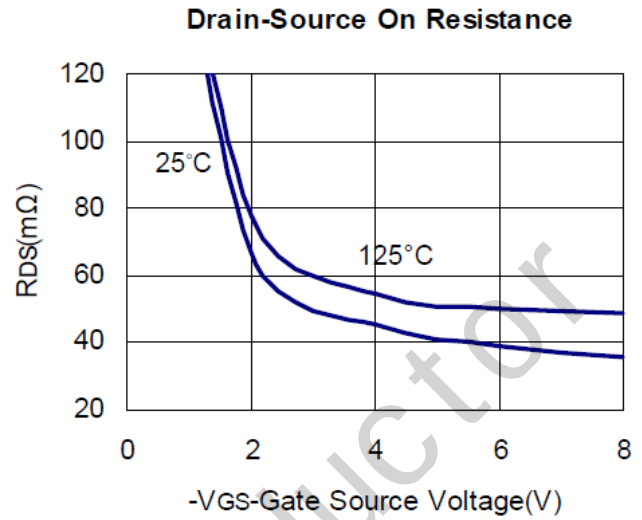
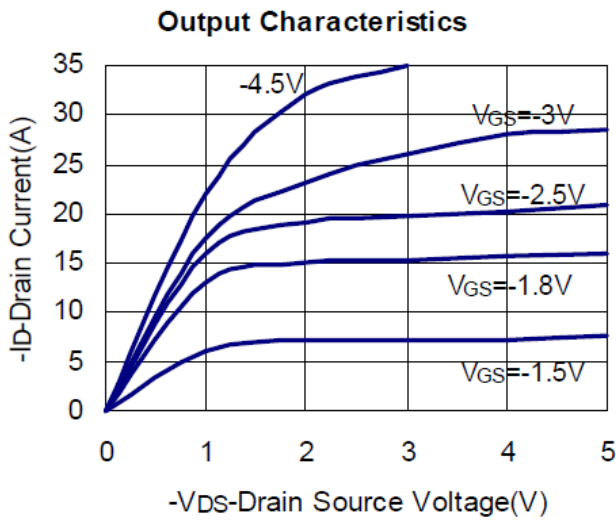
■ ELECTRICAL CHARACTERISTICS($T_A=25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.3		-1.0	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0\text{V}, V_{GS}=\pm 8\text{V}$			± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-12\text{V}, V_{GS}=0$			-1	μA
		$V_{DS}=-12\text{V}, V_{GS}=0$ $T_J=55^\circ\text{C}$			-5	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-4.5\text{V}, I_D=-4.0\text{A}$		34	44	$\text{m}\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-3.0\text{A}$		44	52	
		$V_{GS}=-1.8\text{V}, I_D=-2.0\text{A}$		56	75	
		$V_{GS}=-1.5\text{V}, I_D=-1.0\text{A}$		85	110	
G_{fs}	Forward Transconductance	$V_{DS}=-5\text{V}, I_D=-4.0\text{A}$		22		S
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	$I_S=-1.0\text{A}, V_{GS}=0\text{V}$		-0.67	-1.2	V
Dynamic Parameters						
Q_g	Total Gate Charge	$V_{DS}=-10\text{V}$ $V_{GS}=-4.5\text{V}$ $I_D=-4.0\text{A}$		11.1		nC
Q_{gs}	Gate-Source Charge			3.1		
Q_{gd}	Gate-Drain Charge			2.4		
C_{iss}	Input Capacitance	$V_{DS}=-10\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$		989		pF
C_{oss}	Output Capacitance			167		
C_{rss}	Reverse Transfer Capacitance			75.5		
$T_{d(on)}$	Turn-On Time	$V_{DS}=-10\text{V}$ $I_D=-3.7\text{A}$		712		nS
T_r				1386		
$T_{d(off)}$	Turn-Off Time	$V_{GEN}=-4.5\text{V}$ $R_G=1\Omega$		9.1		
T_f				4		

Note: 1. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

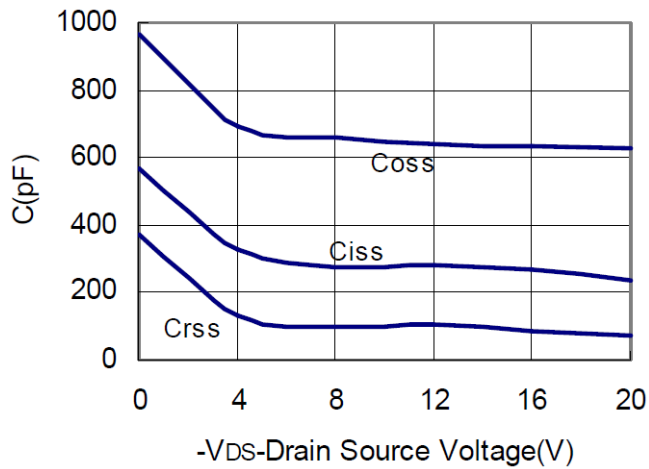
2.Static parameters are based on package level with recommended wire bonding

■ **TYPICAL CHARACTERISTICS** (25 °C Unless Note)

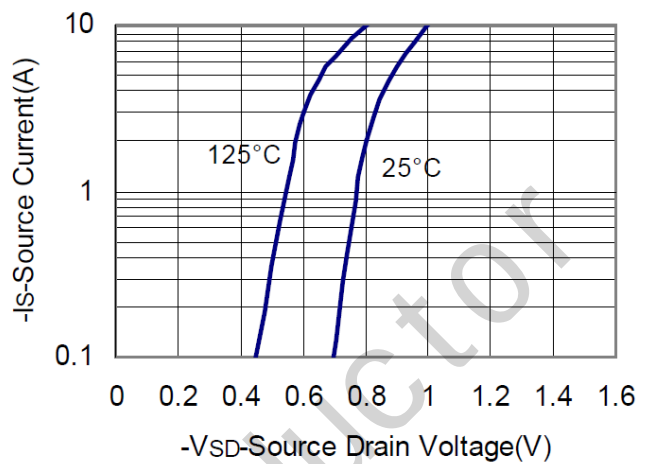


■ **TYPICAL CHARACTERISTICS** (continuous)

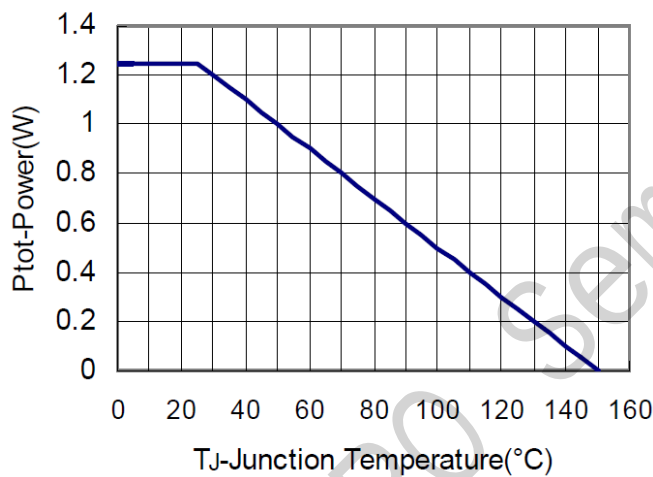
Capacitance



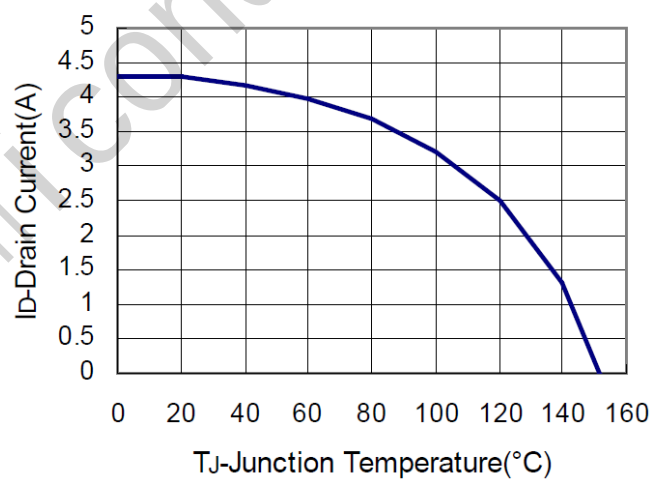
Source Drain Diode Forward



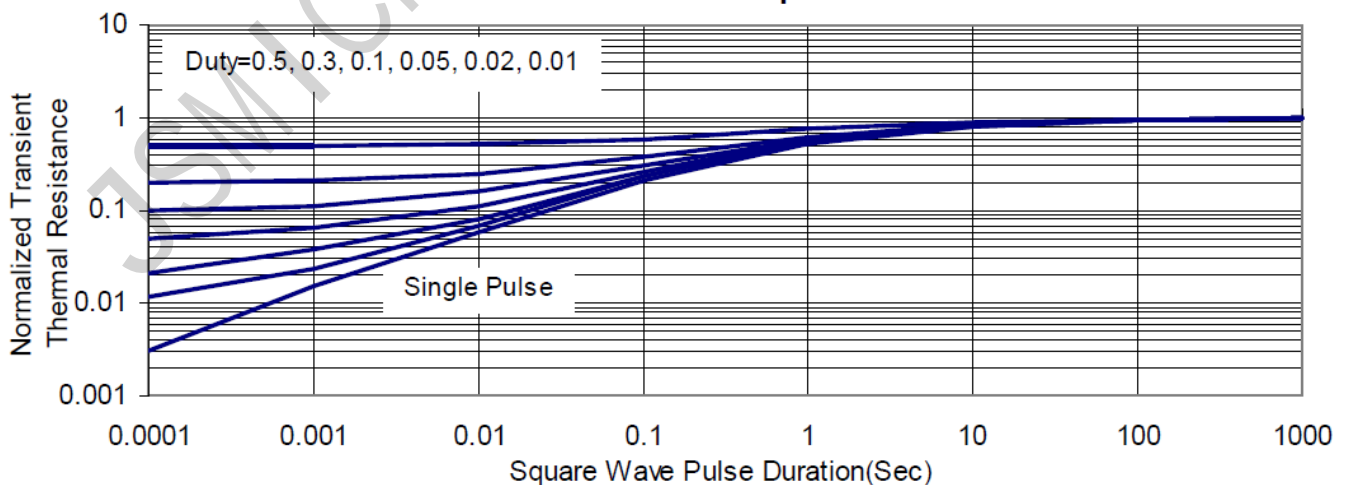
Power Dissipation



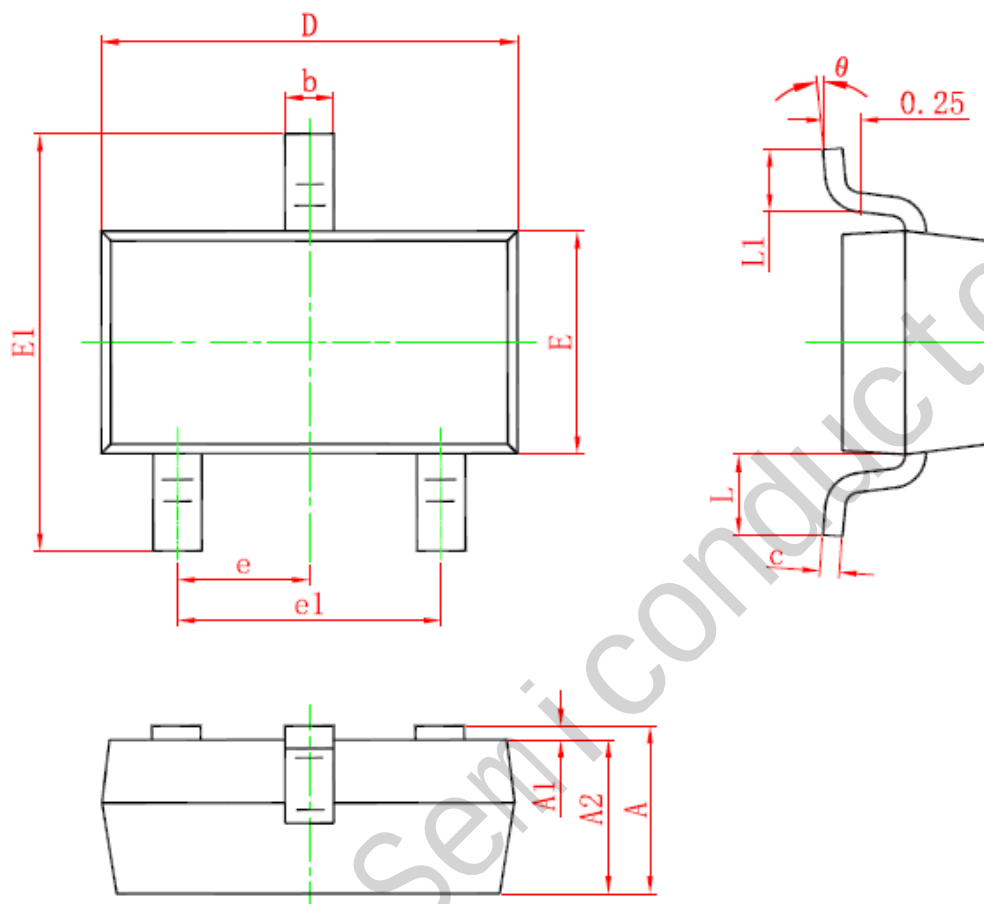
Drain Current



Thermal Transient Impedance



■ SOT23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°