

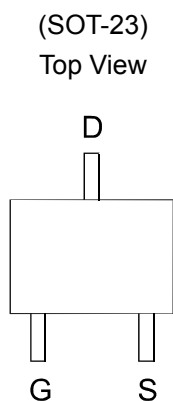
N-Channel 20V(D-S) MOSFET

GENERAL DESCRIPTION

The IT2302 is the N-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone, notebook computer power management and other battery powered circuits, and low in-line power loss that are needed in a very small outline surface mount package.

PIN CONFIGURATION

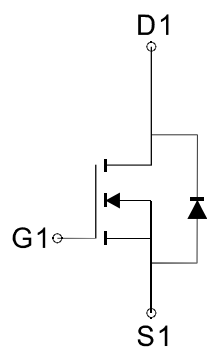


FEATURES

- $R_{DS(ON)} \leq 85m\Omega @ V_{GS}=4.5V$
- $R_{DS(ON)} \leq 115m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} \leq 130m\Omega @ V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

APPLICATIONS

- Power Management in Notebook
- Portable Equipment
- Load Switch
- DSC



N-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Parameter		Symbol	Maximum Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	3.2	A
	$T_A=70^\circ\text{C}$		2.6	
Pulsed Drain Current		I_{DM}	12.8	
Maximum Power Dissipation	$T_A=25^\circ\text{C}$	P_D	1.4	W
	$T_A=70^\circ\text{C}$		0.9	
Operating Junction Temperature		T_J	-55 to 150	$^\circ\text{C}$
Maximum Junction-to-Ambient		R_{thJA}	90	$^\circ\text{C/W}$

*The device mounted on 1in^2 FR4 board with 2 oz copper

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Electrical Characteristics (T_A=25°C Unless Otherwise Specified)

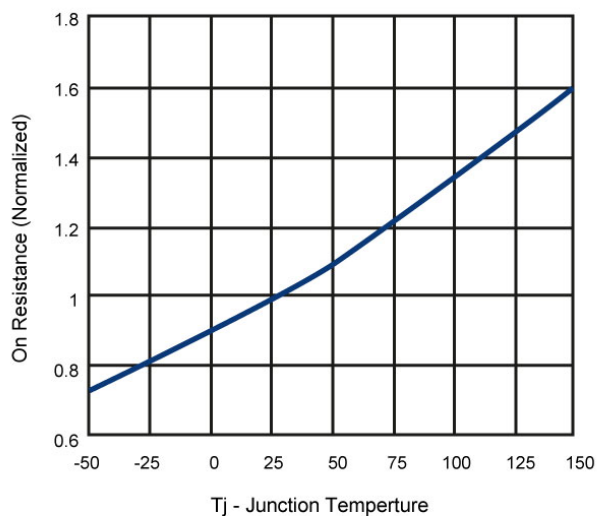
Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC PARAMETERS						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	0.6		1.2	
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0V, V _{GS} =±8V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			1	μA
R _{DS(ON)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D = 2.8A		55	85	mΩ
		V _{GS} =2.5V, I _D = 2.5A		65	115	
		V _{GS} =1.8V, I _D = 2.2A		80	130	
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.75	1.2	V
DYNAMIC PARAMETERS						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =2.8A		9		nC
Q _{gs}	Gate-Source Charge			2.2		
Q _{gd}	Gate-Drain Charge			3		
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		450		pF
C _{oss}	Output Capacitance			72		
C _{rss}	Reverse Transfer Capacitance			22		
t _{d(on)}	Turn-On Delay Time	V _{DD} =10V, R _L =10Ω V _{GEN} =4.5Ω, R _G =6Ω		9		ns
t _r	Rise Time			23		
t _{d(off)}	Turn-Off Delay Time			38		
t _f	Fall Time			3		

Notes: a. Pulse test; pulse width ≤ 380us, duty cycle ≤ 2%

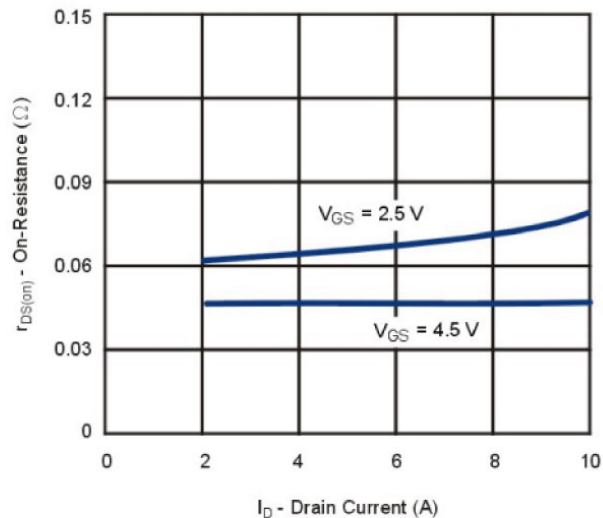
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Typical Characteristics ($T_J = 25^\circ\text{C}$ Noted)

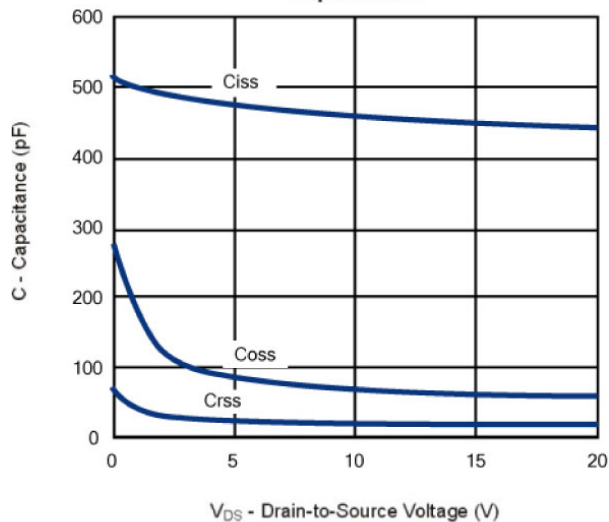
On Resistance vs. Junction Temperature



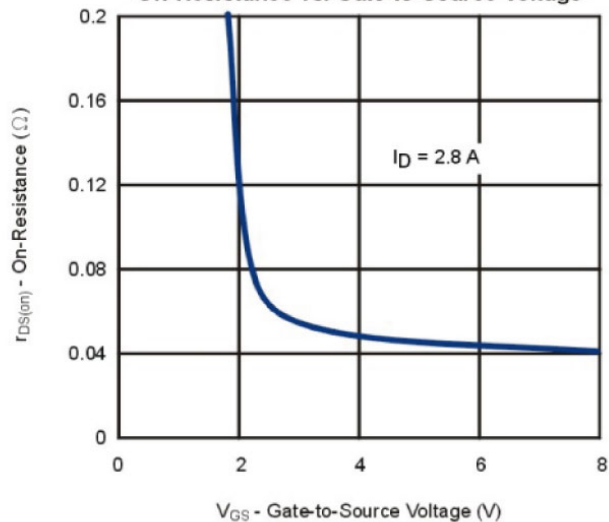
On-Resistance vs. Drain Current



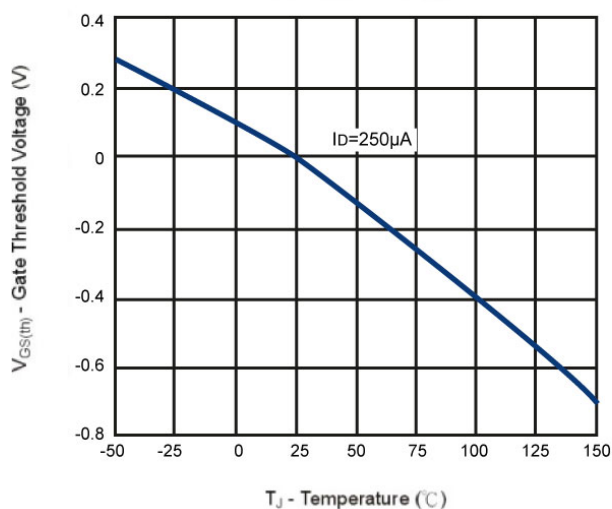
Capacitance



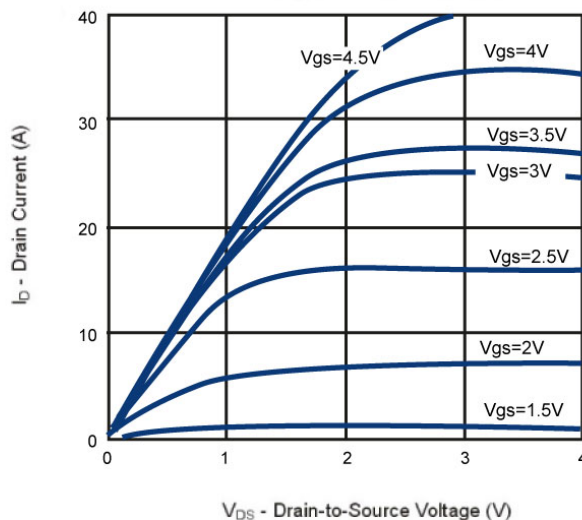
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

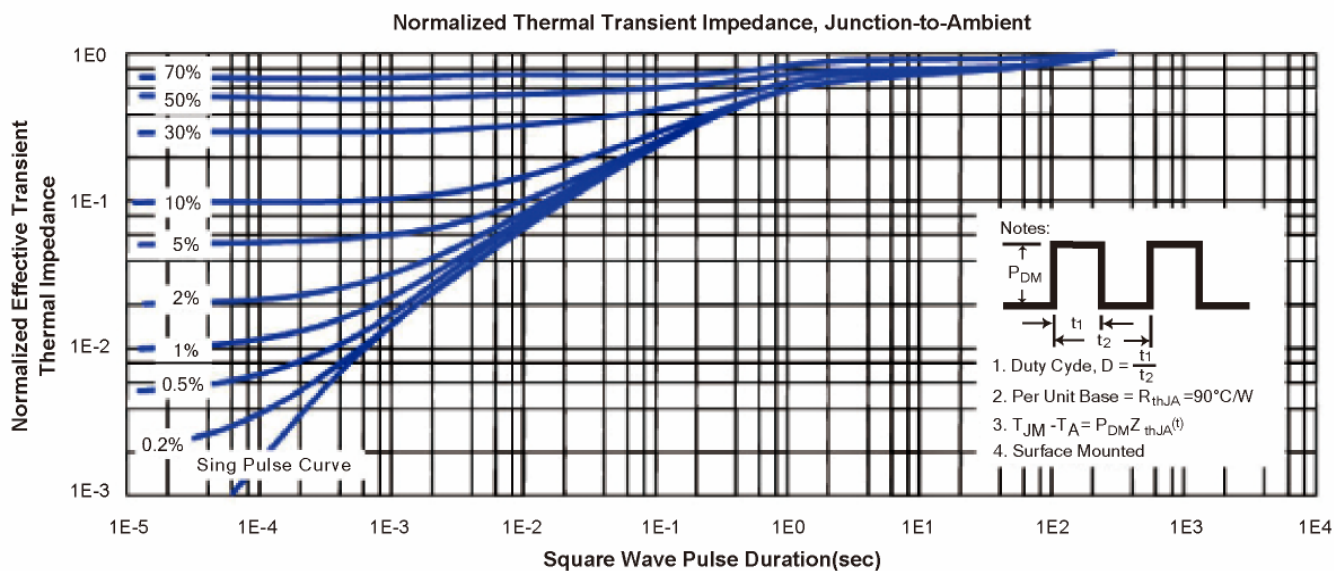
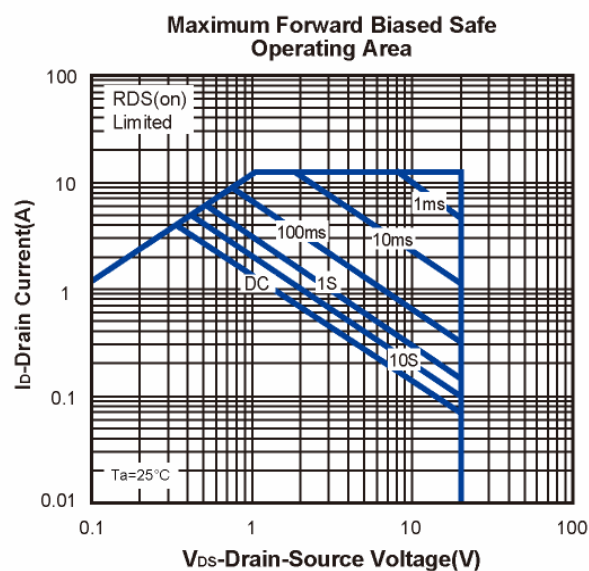
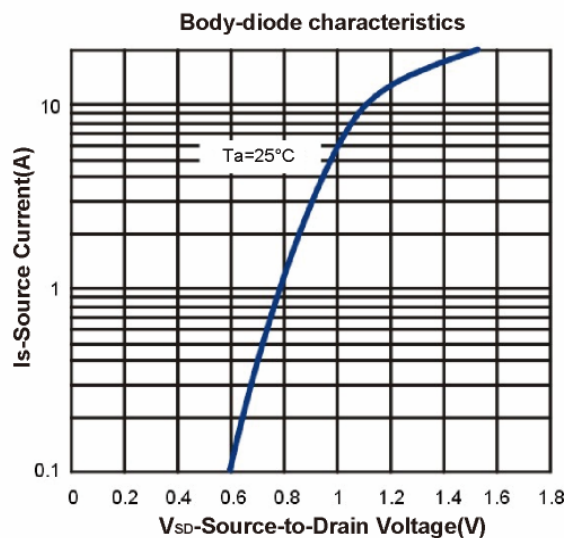
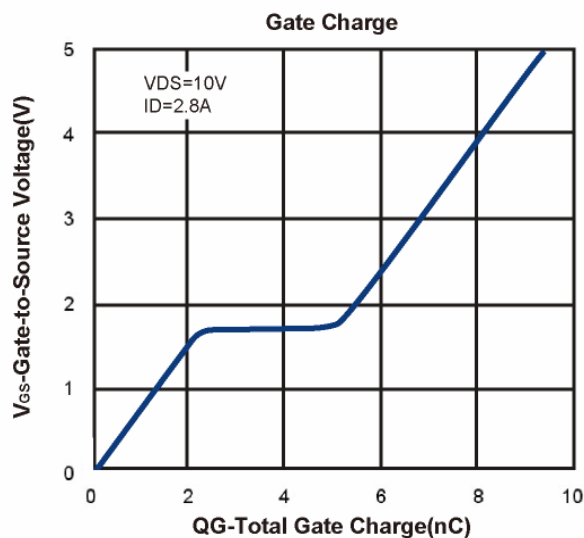


On-Region Characteristics



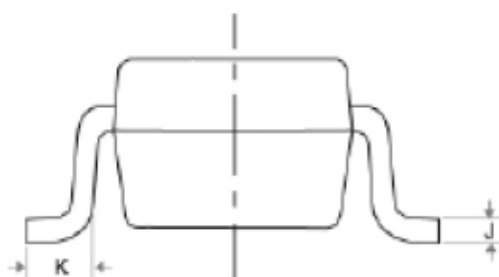
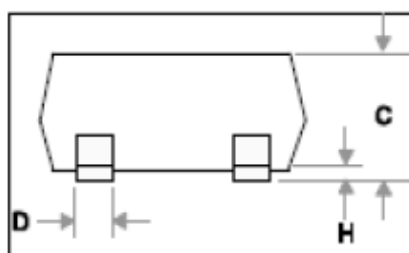
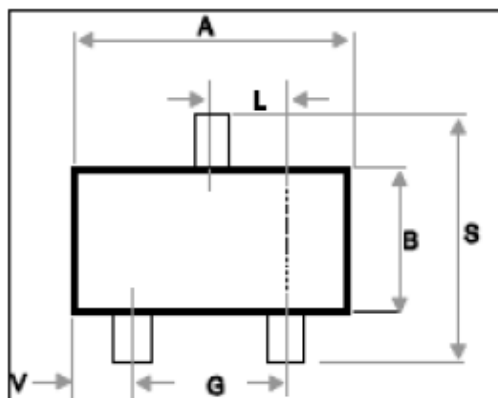
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Typical Characteristics ($T_J = 25^\circ\text{C}$ Noted)



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SOT-23 Package Outline



Symbol	MILLIMETERS (mm)	
	MIN	MAX
A	2.800	3.000
B	1.250	1.350
C	0.900	1.100
D	0.350	0.50
G	1.800	2.000
H	0.000	0.100
J	0.090	0.150
K	0.200	0.450
L	0.950TYP	
S	2.250	2.550
V	0.550	0.600