P-Channel 20V(D-S) MOSFET

GENERAL DESCRIPTION

The ME2313 is the P-Channel logic enhancement mode power field effect transistors are produced 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 and notebook computer power management and other battery powered circuits where high-side switching and low in-line power loss are needed in a very small outline surface mount package.

FEATURES

- $R_{DS(ON)} \leqq 48m\Omega @ V_{GS}=-10V$
- $R_{DS(ON)} \leqq 52m\Omega @ V_{GS}=-4.5V$
- $R_{DS(ON)} \leqq 65m\Omega @ V_{GS}=-2.5V$
- $R_{DS(ON)} \leqq 85m\Omega @ V_{GS}=-1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

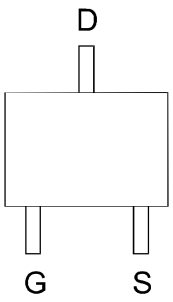
APPLICATIONS

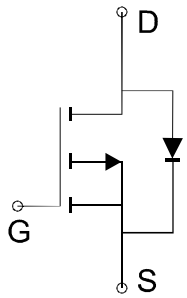
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION

(SOT-23)

Top View





Ordering Information: ME2313 (Pb-free)

ME2313 -G (Green product-Halogen free)

Absolute Maximum Ratings (T_A=25℃ 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℃	I_D	-4.3	A
	T_A=70℃		-3.4	
Pulsed Drain Current		I_{DM}	-17	A
Maximum Power Dissipation	T_A=25℃	P_D	1.4	W
	T_A=70℃		0.9	
Storage Temperature Range		Tstg	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	90	℃/W

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

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Electrical Characteristics (T_j =25℃ Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.5		-1.5	V
I_{GSS}	Gate 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}=-10V, I_D= -5.1A		40	48	mΩ
		V_{GS}=-4.5V, I_D= -4.5A		43	52	
		V_{GS}=-2.5V, I_D= -3.7A		52	65	
		V_{GS}=-1.8V, I_D= -1.7A		60	85	
V_{SD}	Diode Forward Voltage	I_S=-4.1A, V_{GS}=0V		-0.8	-1.2	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-5.1A		10.5		nC
Qg	Total Gate Charge	V_{DS}=-10V, V_{GS}=-2.5V, I_D=-5.1A		6.2		
Qgs	Gate-Source Charge			2.8		
Qgd	Gate-Drain Charge			2.3		
Rg	Gate-Resistance	V_{DS}=0V, V_{GS}=0V, F=1MHz		7.7		Ω
Ciss	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz		934		pF
Coss	Output Capacitance			93.7		
Crss	Reverse Transfer Capacitance			30.3		
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=-10V, R_L =10Ω R_{GEN}=1Ω, V_{GS}=-10V I_D=-4.1A		36.1		ns
t_r	Turn-On Rise Time			21.7		
$t_{d(off)}$	Turn-Off Delay Time			59.4		
t_f	Turn-Off Fall Time			5		

Notes: a. Pulse test; pulse width ≦ 300us, duty cycle≦ 2%

b. Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.

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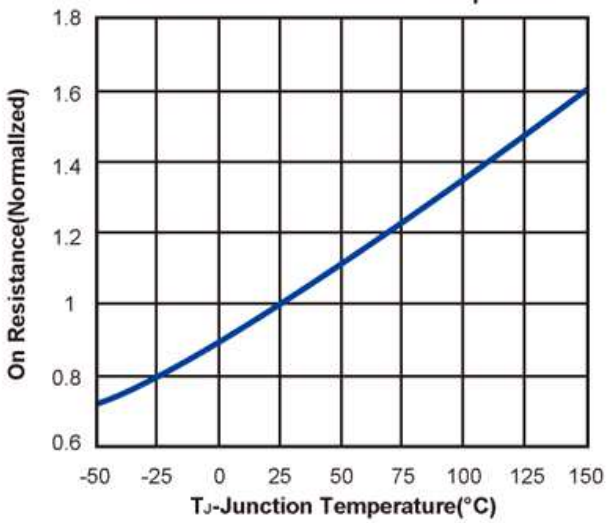
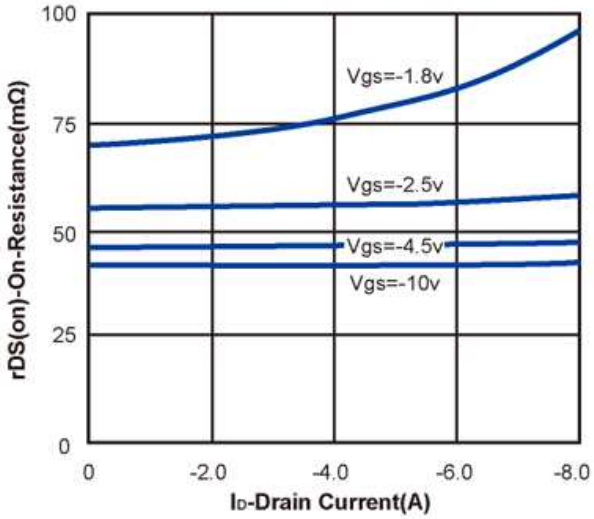
Typical Characteristics (T_J =25℃ Noted)

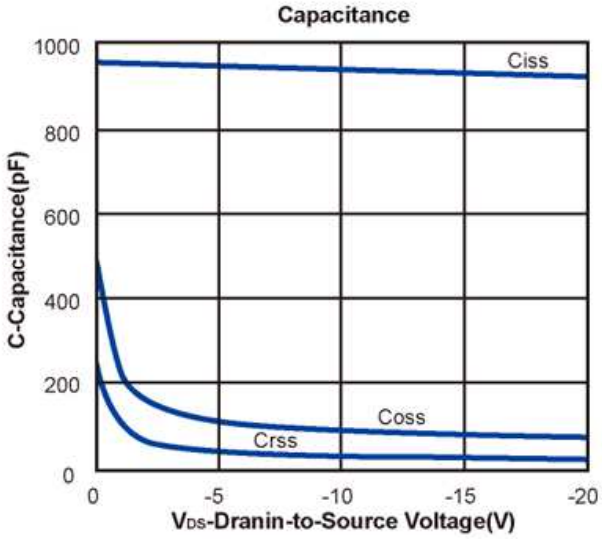
On Resistance vs. Junction Temperature



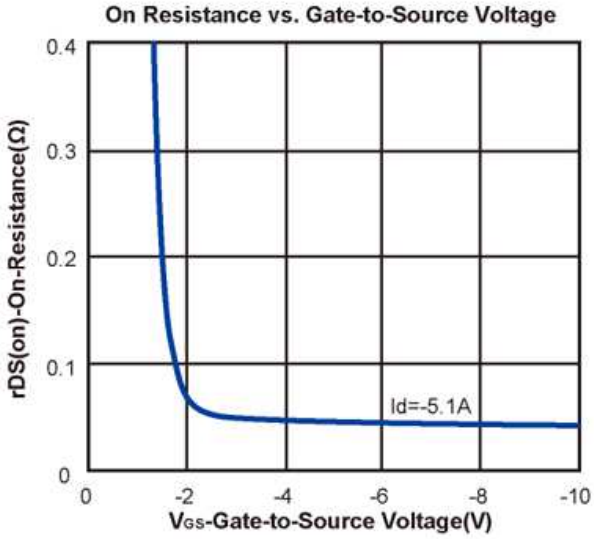
On Resistance vs. Drain Current



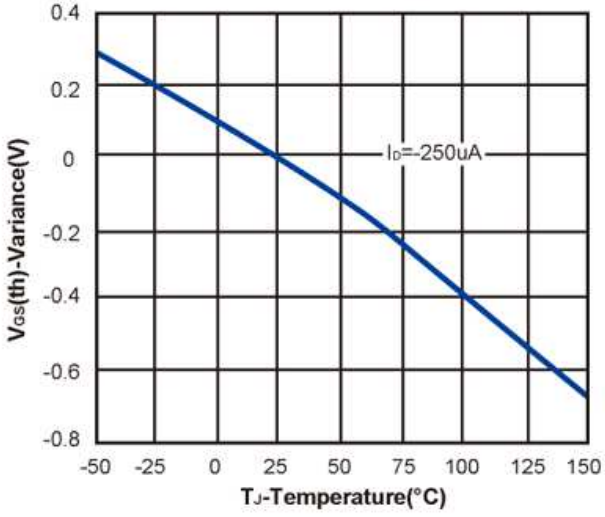
Capacitance



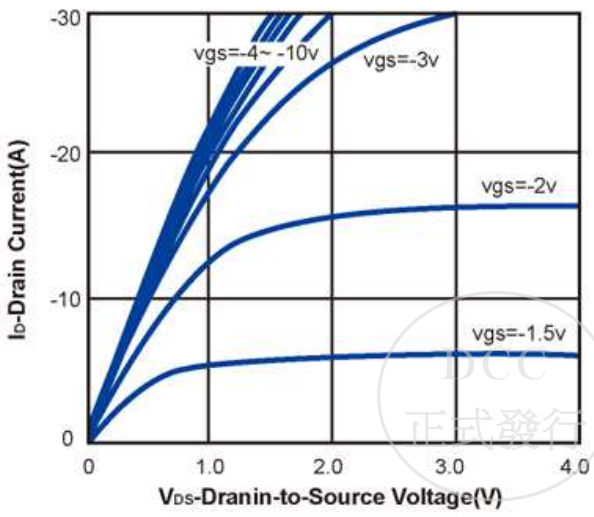
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage



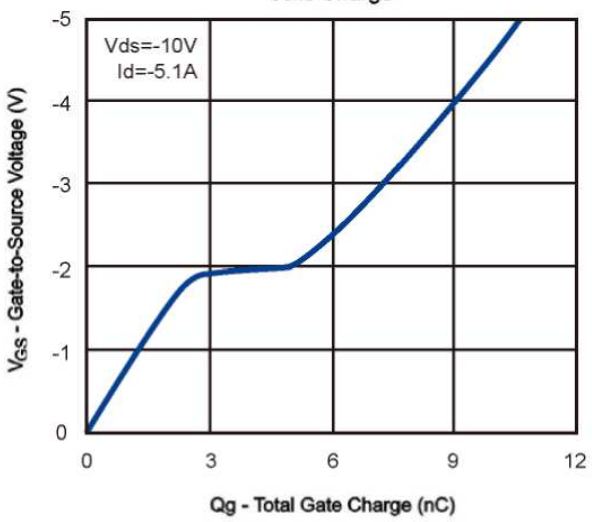
On-Region Characteristics



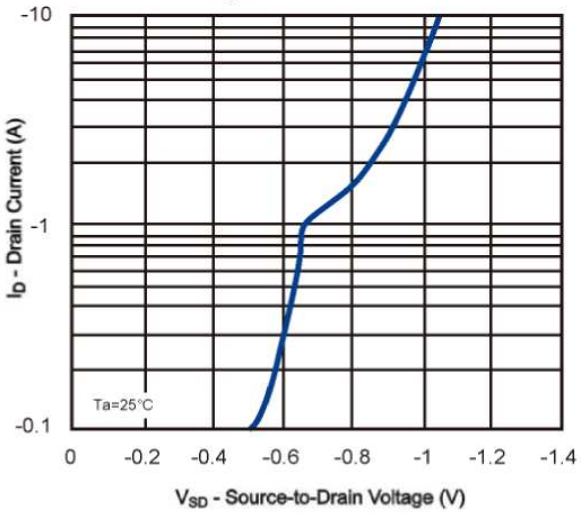
P-Channel 20V(D-S) MOSFET

Typical Characteristics (T_J =25℃ Noted)

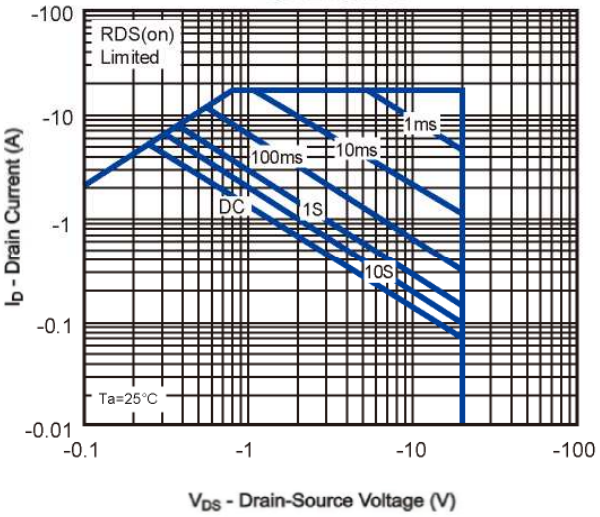
Gate Charge



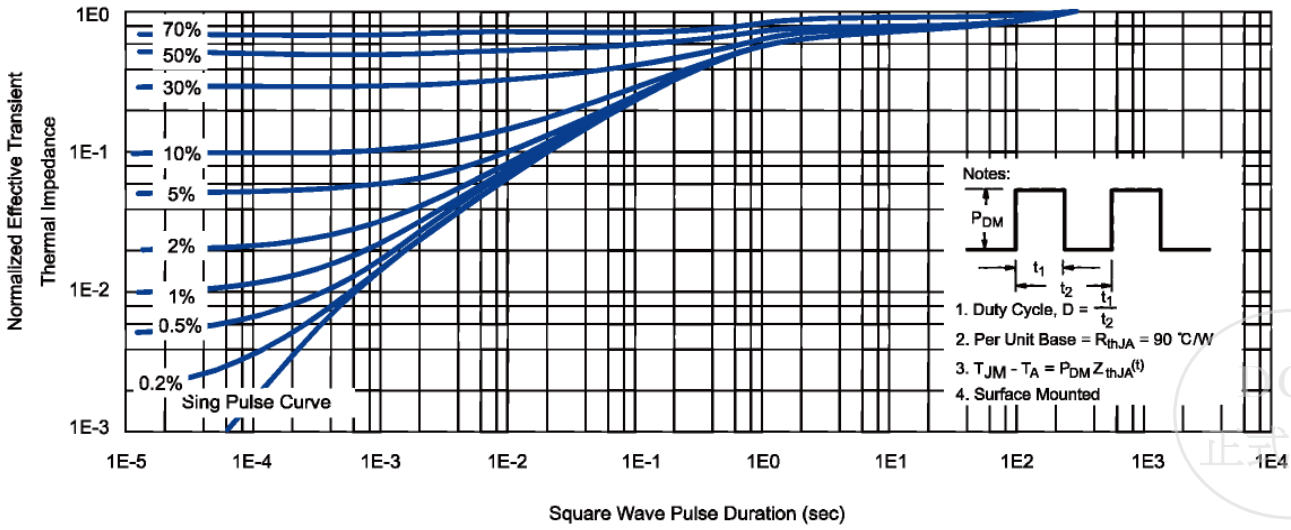
Body-diode characteristics



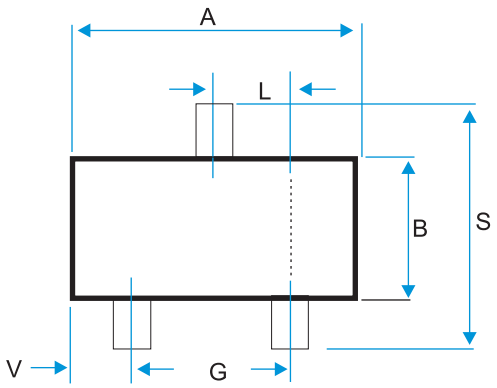
Maximum Forward Biased Safe Operating Area

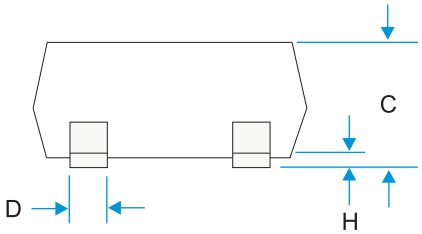


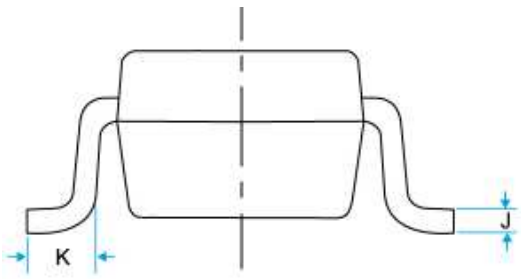
Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-23 Package Outline







DIM	MILLIMETERS (mm)	
	MIN	MAX
A	2.800	3.00
B	1.200	1.70
C	0.900	1.30
D	0.350	0.50
G	1.780	2.04
H	0.010	0.15
J	0.085	0.20
K	0.300	0.65
L	0.890	1.02
S	2.100	3.00
V	0.450	0.60