Preliminary-ME2320DS/ME2320DS-G

N-Channel 20V (D-S) MOSFET , ESD Protection

GENERAL DESCRIPTION

The ME2320DS is the N-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

- $R_{DS(ON)}$=21mΩ@V_{GS}=4.5V
- $R_{DS(ON)}$=25 mΩ@V_{GS}=2.5V
- $R_{DS(ON)}$=33 mΩ@V_{GS}=1.8V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

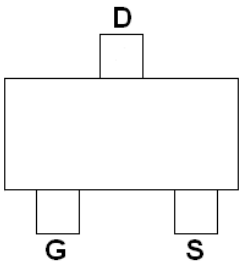
APPLICATIONS

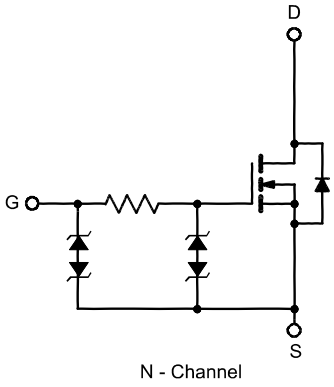
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION

(SOT-23)

Top View





N - Channel

Ordering Information:ME2320DS(Pb-Free)

ME2320DS-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	6.4	A
	T_A=70℃		5.1	
Pulsed Drain Current		I_{DM}	26	A
Maximum Power Dissipation	T_A=25℃	P_D	1.4	W
	T_A=70℃		0.9	
Junction and Storage Temperature Range		TJ, 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	0.4		1	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±4.5V			±1	μA
		V_{DS}=0V, V_{GS}=±8V			±10	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V			1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance[a]	V_{GS}=4.5V, I_D= 6.5A		17	21	mΩ
		V_{GS}=2.5V, I_D= 5.5A		20	25	
		V_{GS}=1.8V, I_D= 5A		25	33	
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V		0.6	1	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=10V, V_{GS}=4.5, I_D=6.5A		10		nC
Qgs	Gate-Source Charge			0.9		
Qgd	Gate-Drain Charge			3		
Ciss	Input Capacitance	V_{DS}=10V, V_{GS}=0V,f=1MHz		150		pF
Coss	Output Capacitance			95		
Crss	Reverse Transfer Capacitance			25		
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=10V, R_L= 1.5Ω V_{GS}=5V, R_{GEN}=3Ω		250		ns
tr	Turn-On Rise Time			420		
$t_{d(off)}$	Turn-Off Delay Time			3950		
tf	Turn-Off Fall Time			3700		

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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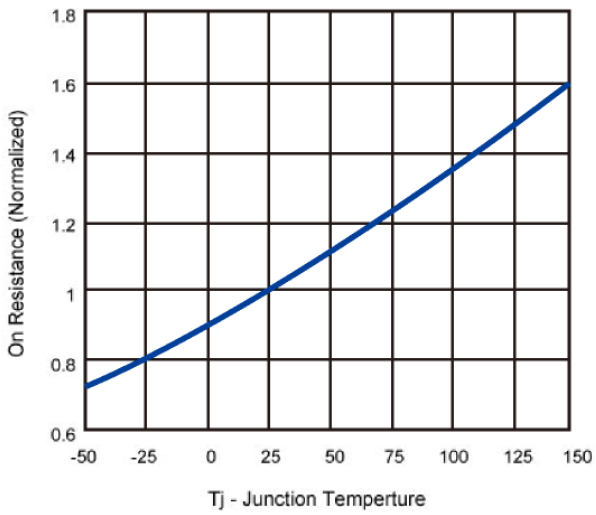
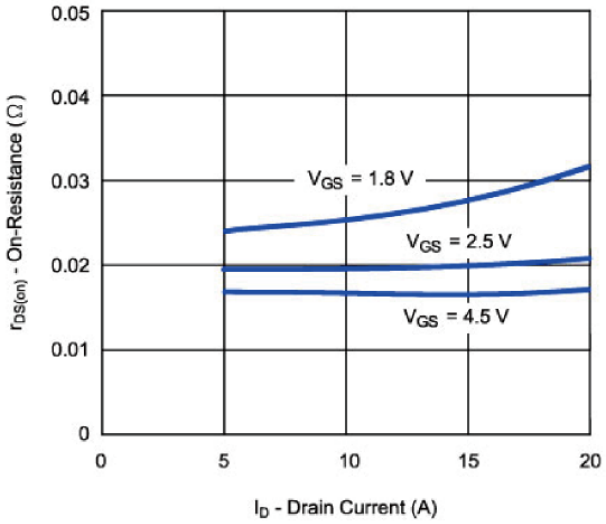
Typical Characteristics (T_J =25℃ Noted)

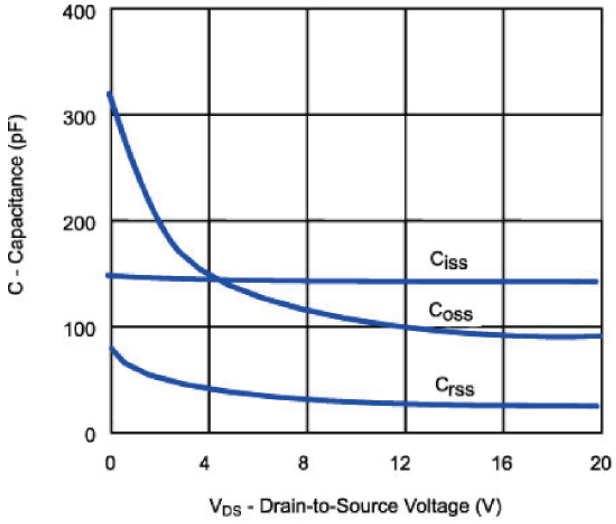
On Resistance vs. Junction Temperture



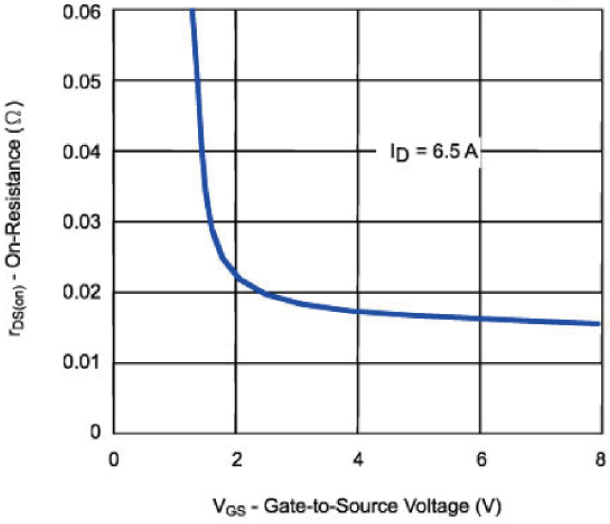
On-Resistance vs. Drain Current



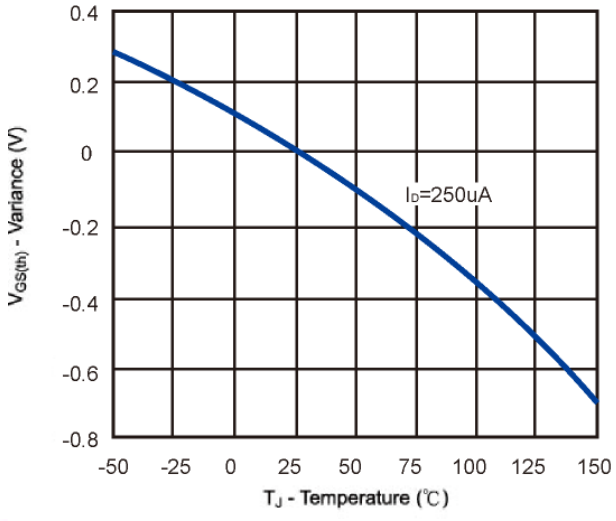
Capacitance



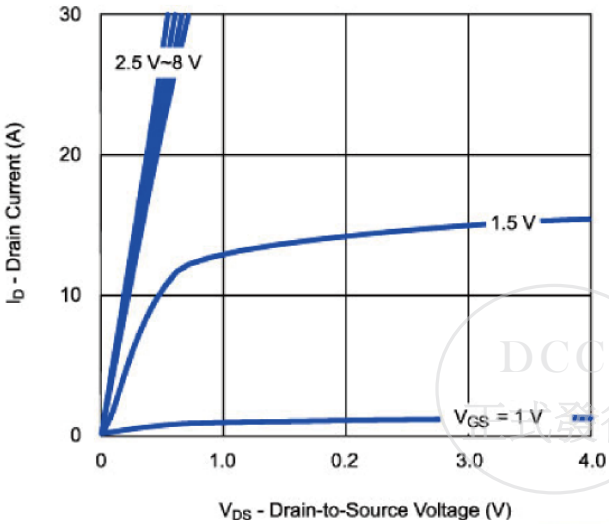
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



On-Region Characteristics



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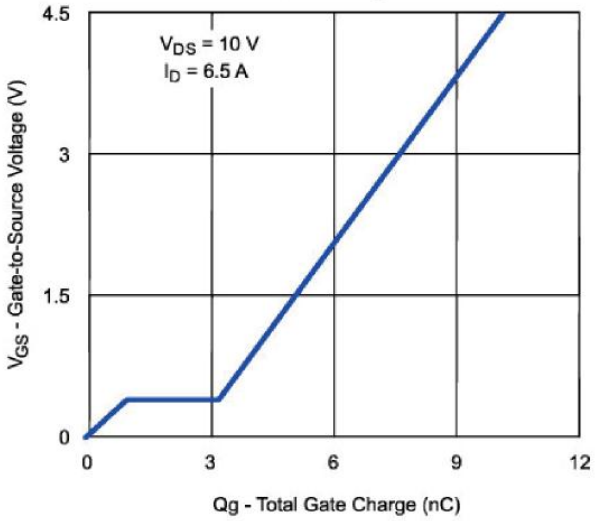
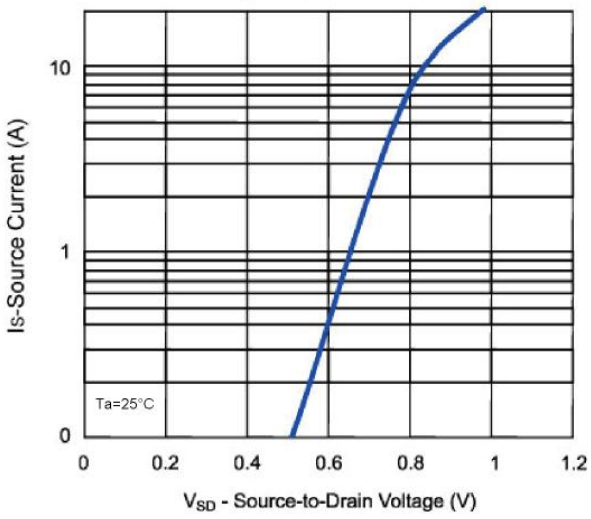
Typical Characteristics (T_J =25℃ Noted)

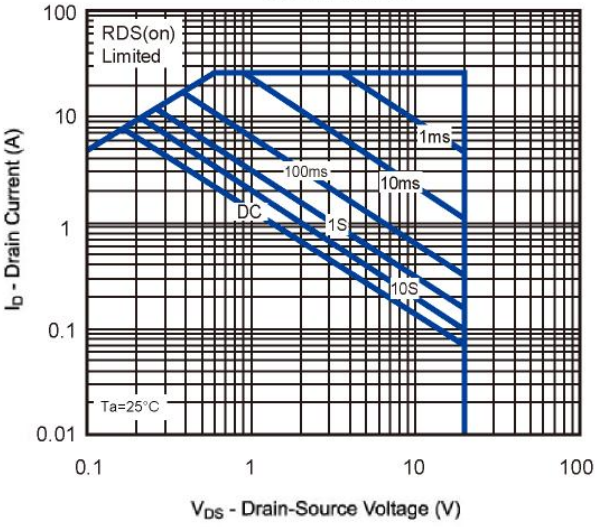
Gate Charge



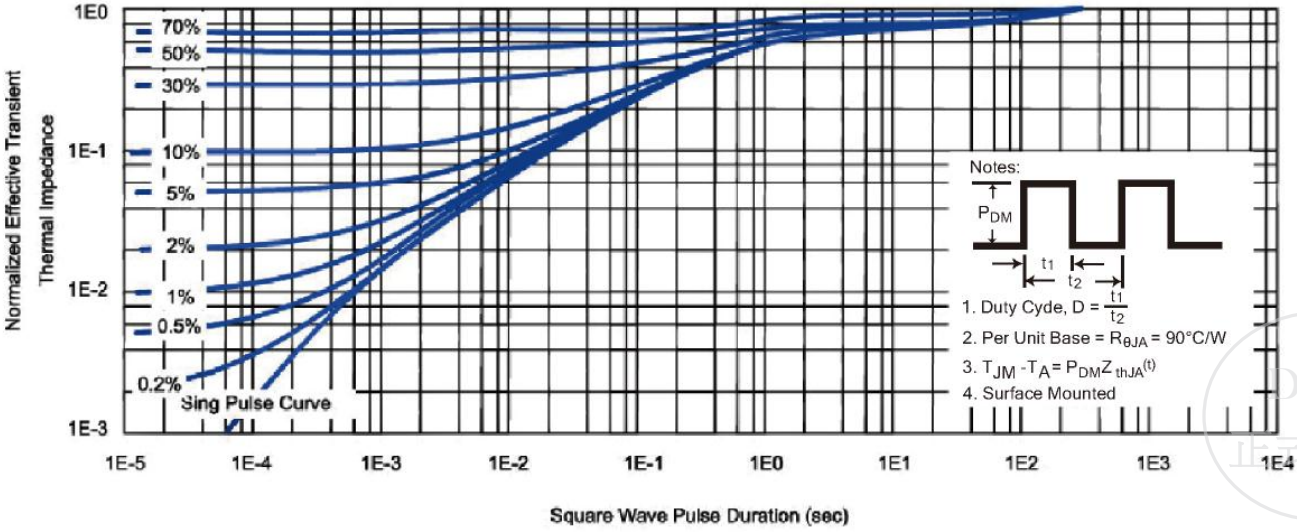
Body-diode characteristics



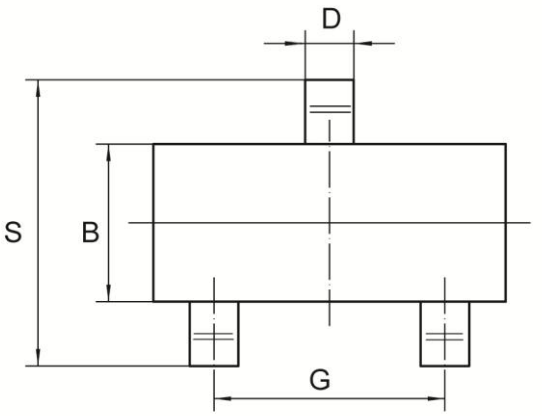
Maximum Forward Biased Safe Operating Area

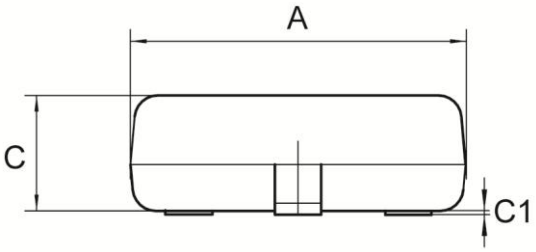


Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-23 Package Outline





Symbol	MILLIMETERS	
	MIN	MAX
A	2.8	3.0
B	1.2	1.4
C	0.9	1.1
C1	-	0.1
D	0.3	0.5
G	1.90 REF	
J	0.05	0.15
K	0.2	-
S	2.2	2.6