ME2306/ME2306-G

N-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The ME2306 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.

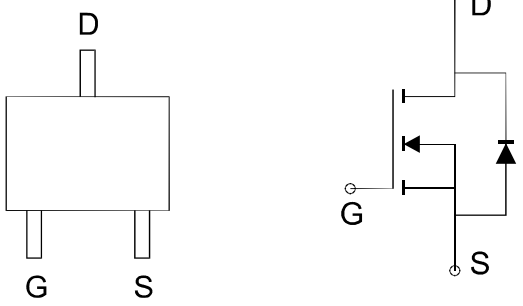
FEATURES

- $R_{DS(ON)} \leqq 37m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 49m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

PIN CONFIGURATION

(SOT-23)

Top View



Ordering Information: ME2306 (Pb-free)

ME2306-G (Green product-Halogen free)

PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Steady State		Unit
Drain-Source Voltage		V_{DSS}	30		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current(Tj=150℃)	T_A=25℃	I_D	4.7		A
	T_A=70℃		3.7		
Pulsed Drain Current		I_{DM}	20		
Maximum Power Dissipation	T_A=25℃	P_D	1.32		W
	T_A=70℃		0.84		
Operating Junction Temperature		T_J	-55 to 150		℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	T≦10 sec	70	℃/W
			Steady State	95	
Thermal Resistance-Junction to Case*		$R_{\theta JC}$	65		℃/W

*The device mounted on 1in2 FR4 board with 2 oz copper

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Electrical Characteristics (T_A=25℃ Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC PARAMETERS						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1		3	
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		V_{DS}=30V, V_{GS}=0V T_J=55℃			10	
$I_{D(ON)}$	On-State Drain Current[a]	V_{DS}≧5V, V_{GS}= 10V	20			A
$R_{DS(ON)}$	Drain-Source On-Resistance[a]	V_{GS}=10V, I_D= 4A		25	37	mΩ
		V_{GS}=4.5V, I_D= 3.5A		35	49	
V_{SD}	Diode Forward Voltage	I_S=1.25A, V_{GS}=0V		0.8	1.2	V
DYNAMIC PARAMETERS						
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_D=4A		13		nC
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_D=4A		6.3		
Qgs	Gate-Source Charge			2.9		
Qgd	Gate-Drain Charge			2.4		
Rg	Gate Resistance	f =1MHz		0.6		Ω
Ciss	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz		380		pF
Coss	Output Capacitance			64		
Crss	Reverse Transfer Capacitance			15		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=15V, R_L =15Ω I_D=1A, V_{GEN}=10V, R_G=6Ω		9		ns
t_r	Rise Time			14		
$t_{d(off)}$	Turn-Off Delay Time			33		
t_f	Fall Time			3		

Notes: a. Pulse test: pulse width≦ 300us, duty cycle≦ 2%, Guaranteed by design, not subject to production testing.

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

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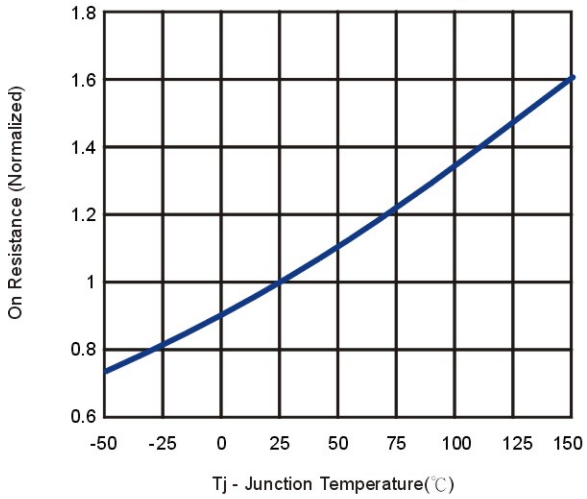
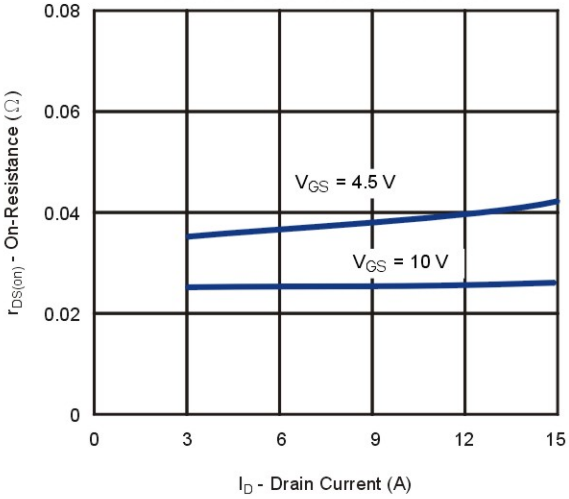
N-Channel Enhancement Mode MOSFET

Typical Characteristics (T_J =25℃ Noted)

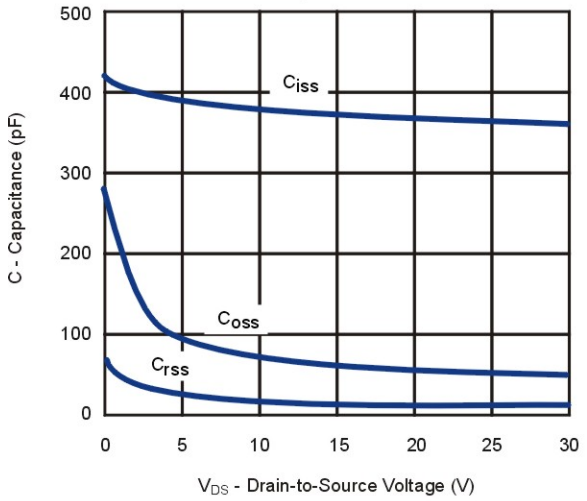
On Resistance vs. Junction Temperature



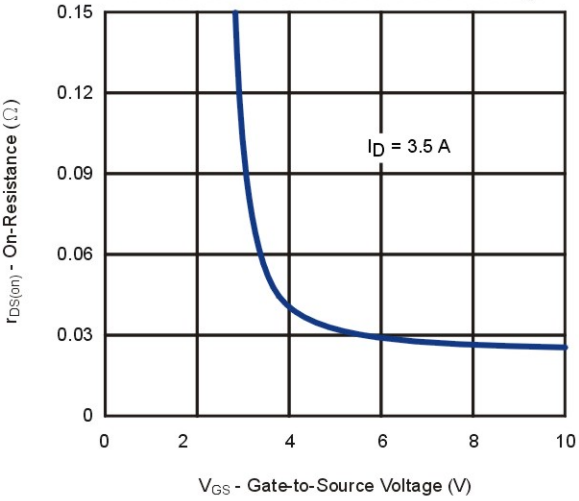
On-Resistance vs. Drain Current



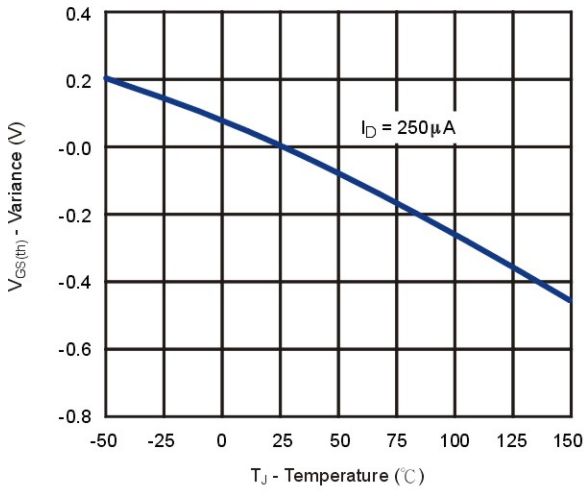
Capacitance



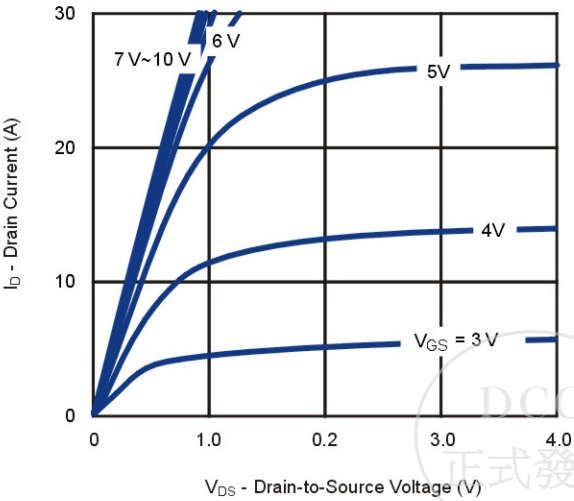
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



On-Region Characteristics



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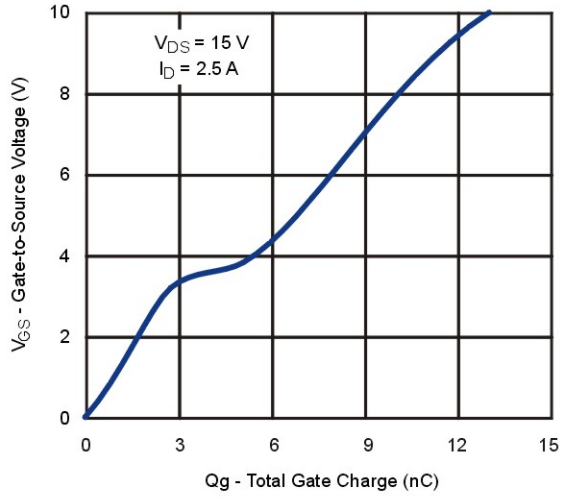
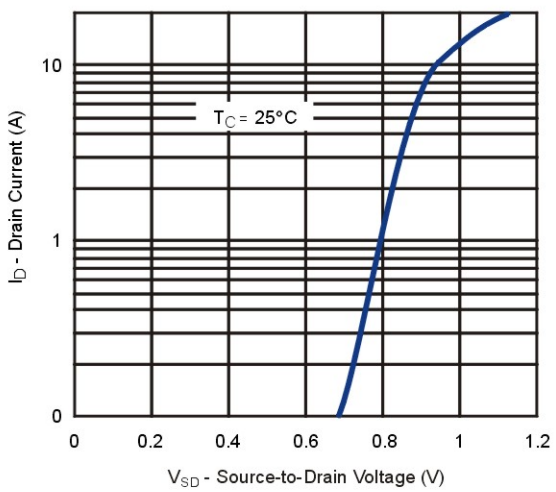
Typical Characteristics (T_J =25℃ Noted)

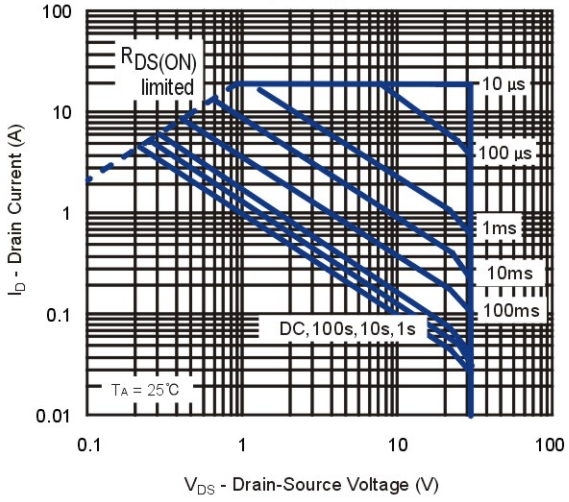
Gate Charge



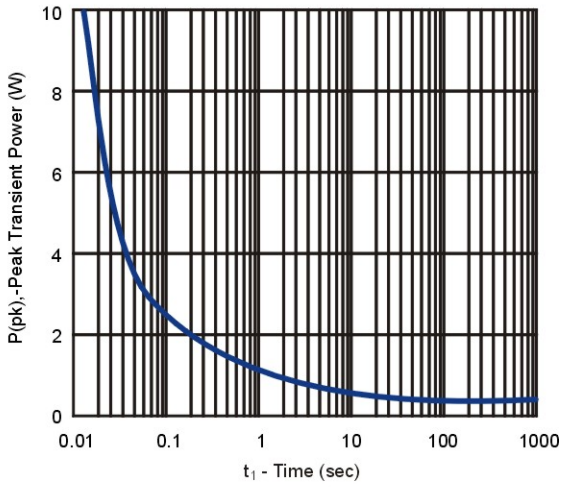
On-Resistance vs. Drain Current



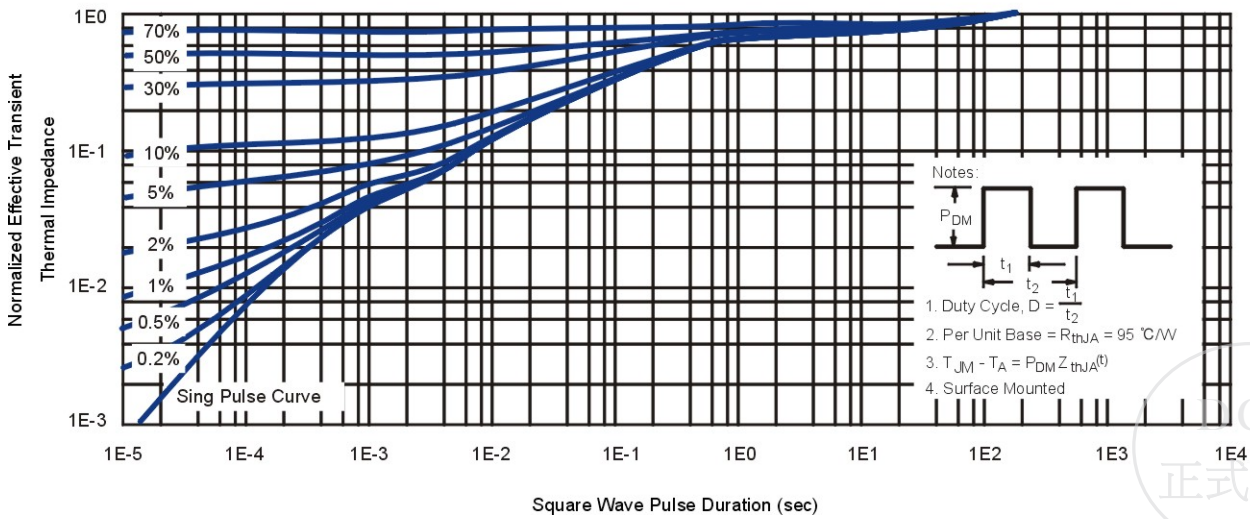
Maximum Forward Biased Safe Operating Area



Single Pulse Maximum Power Dissipation



Normalized Thermal Transient Impedance, Junction-to-Ambient



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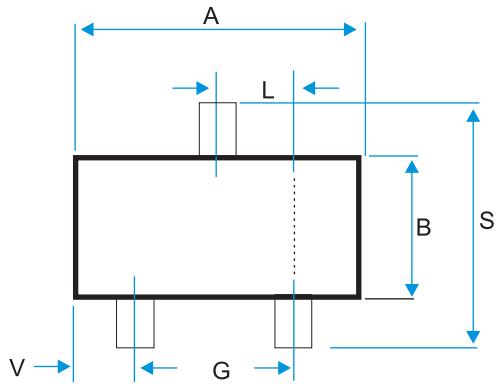
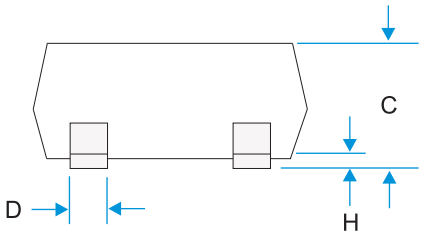
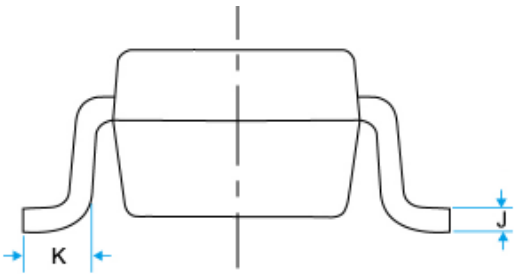
SOT-23 Package Outline







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

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