ME20N03/ ME20N03-G

N-Channel 30V Enhancement MOSFET

GENERAL DESCRIPTION

The ME20N03 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

- $R_{DS(ON)}$ ≦15mΩ@V_{GS}=10V
- $R_{DS(ON)}$ ≦20mΩ @V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

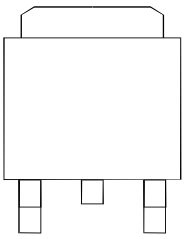
APPLICATIONS

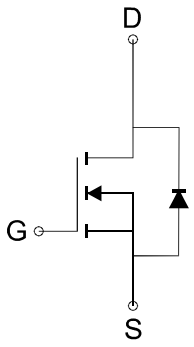
- Power Management in Desktop Computer
- Video Graphic Accelerate Card
- Battery Powered System
- DC/DC Converter

PIN CONFIGURATION

(TO-252)

Top View





N-Channel MOSFET

Ordering Information: ME20N03 (Pb-free)

ME20N03-G (Green product-Halogen free)

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

Parameter		Symbol	Maximum Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	39	A
	T_C=70℃		32	
Pulsed Drain Current		I_{DM}	159	A
Maximum Power Dissipation	T_C=25℃	P_D	37	W
	T_C=70℃		24	
Operating Junction Temperature		T_J	-55 to 150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	3.3	℃/W

Note 1: Bonding wire current limit

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

N-Channel 30V Enhancement MOSFET

Electrical Characteristics (T_C =25℃ Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BV_{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
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D= 15A		11	15	mΩ
		V_{GS}=4.5V, I_D= 15A		16	20	
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V		0.75	1.1	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=10V,I_D=15A		18		nC
Qg	Total Gate Charge	V_{DS}=15V,V_{GS}=4.5V,I_D=15A		9		
Qgs	Gate-Source Charge			4.2		
Qgd	Gate-Drain Charge			4.2		
Ciss	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f =1MHz		700		pF
Coss	Output Capacitance			120		
Crss	Reverse Transfer Capacitance			35		
td(on)	Turn-On Delay Time	V_{DS}=15V, R_L =1.5Ω V_{GS}=10V, R_G=6Ω I_D=15A		13.8		ns
tr	Turn-On Rise Time			178		
td(off)	Turn-Off Delay Time			28.7		
tf	Turn-Off Fall Time			8.8		

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

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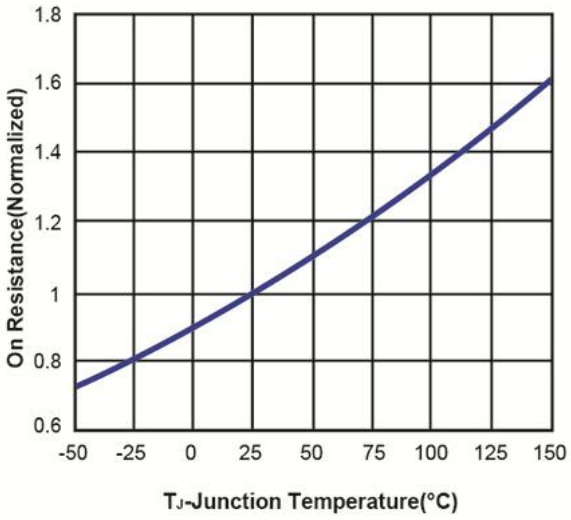
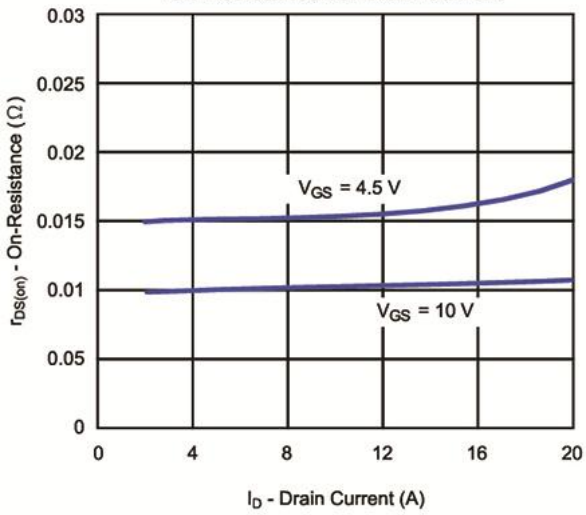
Typical Characteristics (T_J =25℃ Noted)

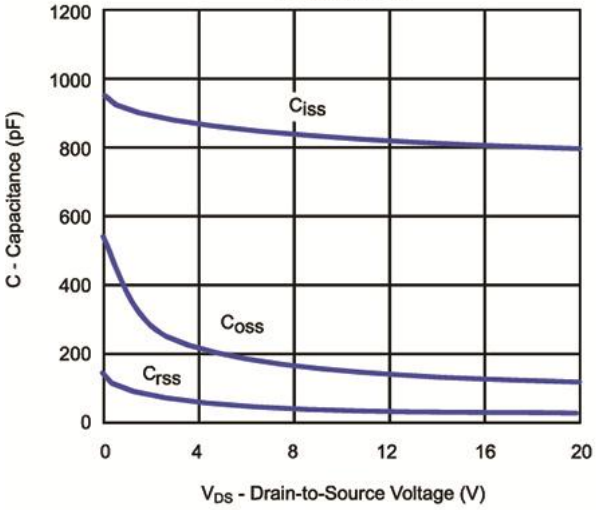
On Resistance vs. Junction Temperature



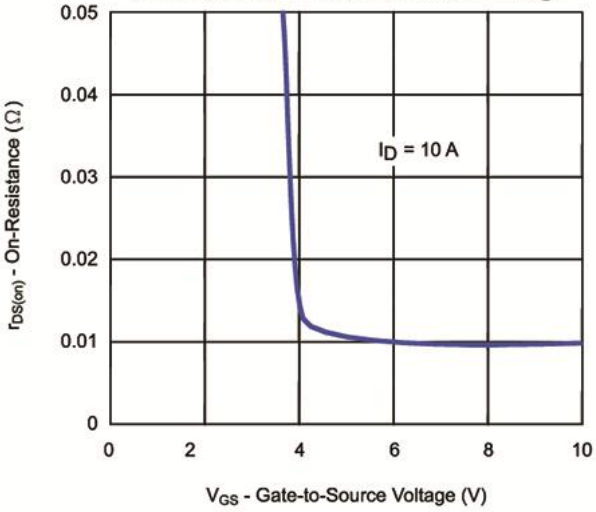
On-Resistance vs. Drain Current



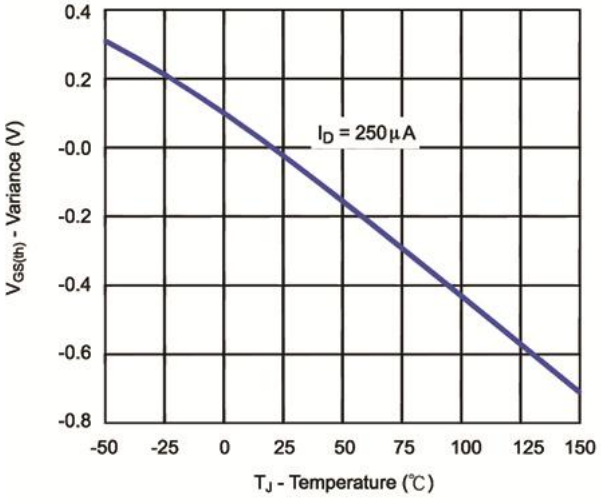
Capacitance



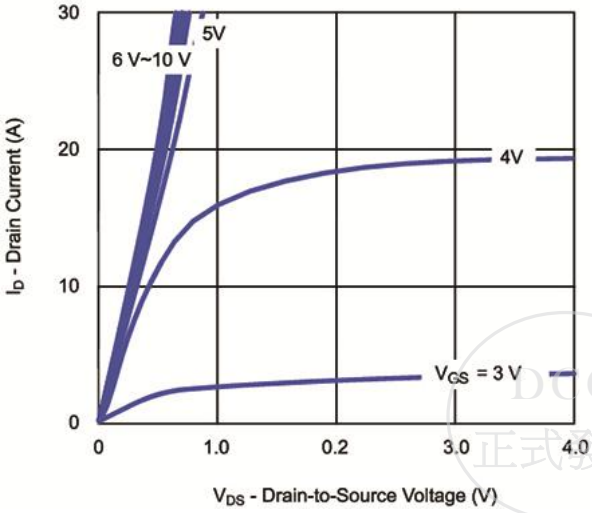
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



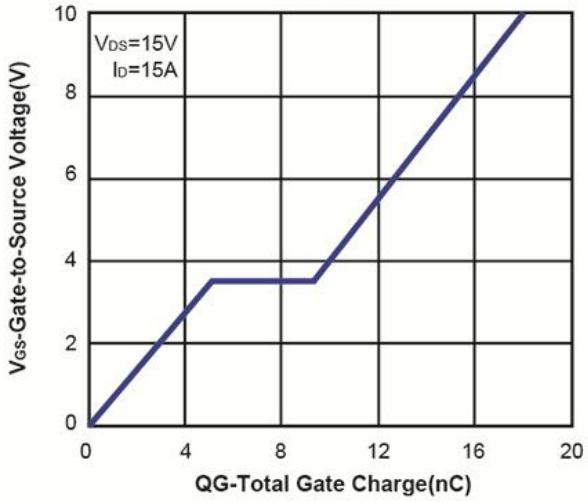
On-Region Characteristics



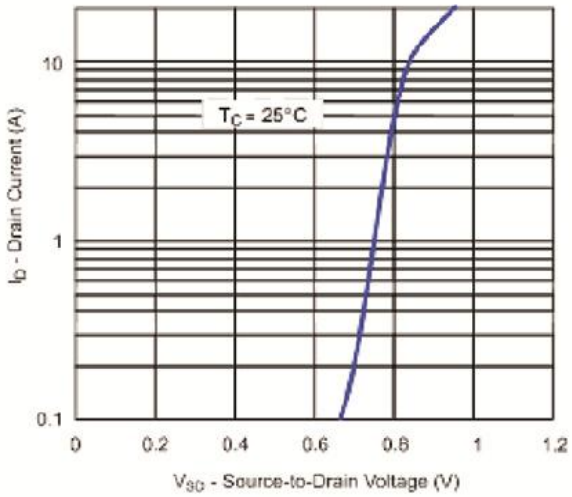
N-Channel 30V Enhancement MOSFET

Typical Characteristics (T_J =25℃ Noted)

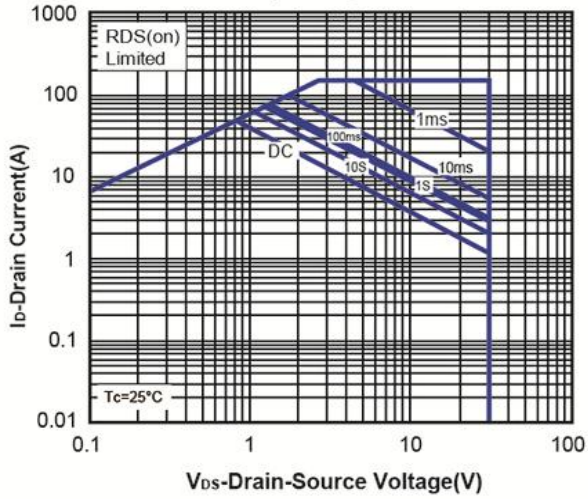
Gate Charge



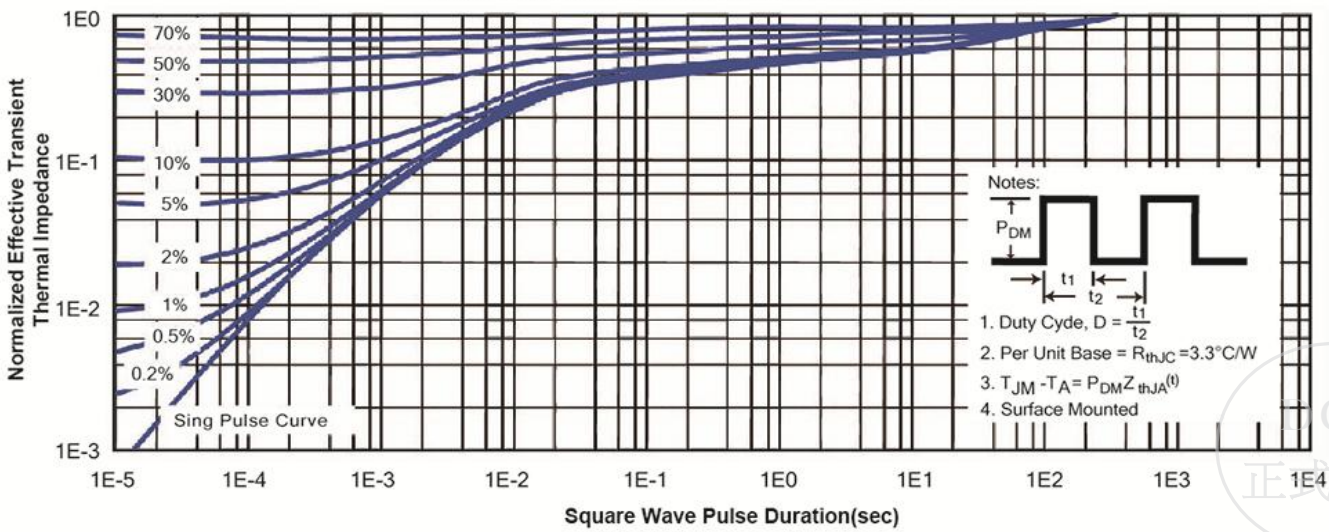
On-Resistance vs. Drain Current



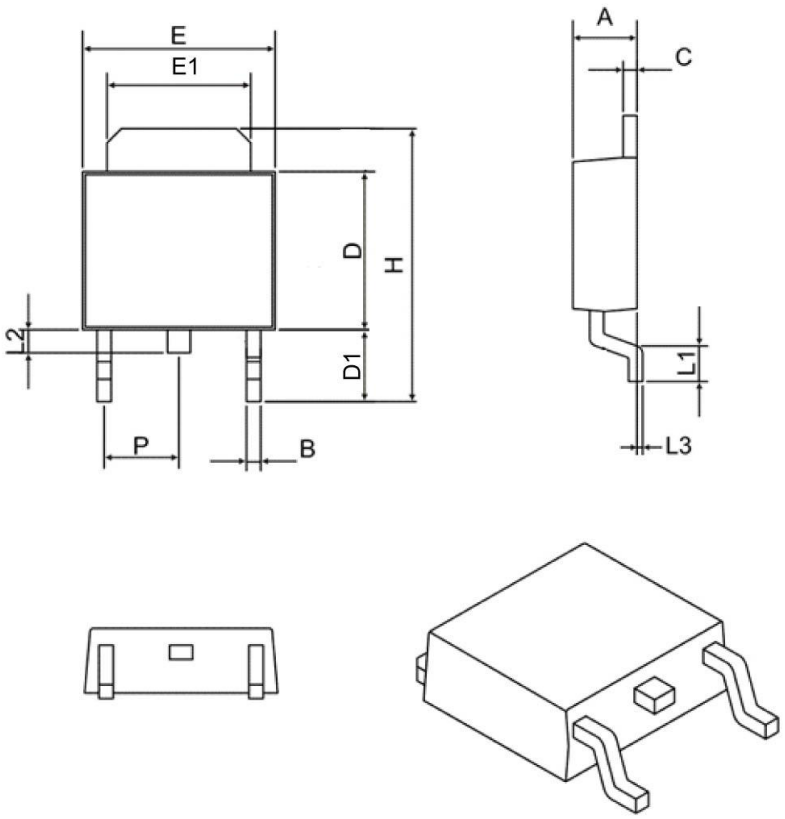
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



TO-252 Package Outline



SYMBOL	MIN	MAX
A	2.10	2.50
B	0.40	0.90
C	0.40	0.90
D	5.30	6.30
D1	2.20	2.90
E	6.30	6.75
E1	4.80	5.50
L1	0.90	1.80
L2	0.50	1.10
L3	0.00	0.20
H	8.90	10.40
P	2.30 BSC	