P-Channel 20V(D-S) MOSFET, ESD Protected

GENERAL DESCRIPTION

The ME2301DN 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 low in-line power loss are needed in a very small outline surface mount package.

FEATURES

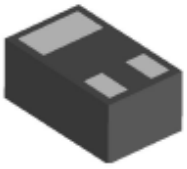
- $R_{DS(ON)}$ ≦90mΩ@V_{GS}=-4.5V
- $R_{DS(ON)}$ ≦130mΩ@V_{GS}=-2.5V
- Super high density cell design for extremely low $R_{DS(ON)}$

APPLICATIONS

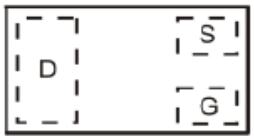
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC

PIN CONFIGURATION

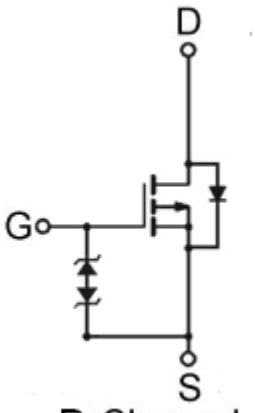
(DFN1006-3L)



Package Outline



Top View



P-Channel

Ordering Information: ME2301DN (Pb-free)

ME2301DN-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	-1.6	A
	T_A=70℃		-1.2	
Pulsed Drain Current		I_{DM}	-6.3	A
Maximum Power Dissipation	T_A=25℃	P_D	0.36	W
	T_A=70℃		0.23	
Operating Junction Temperature		T_J	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	350	℃/W

* The device mounted on 1in^2 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						
$V_{(BR)DSS}$	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}=±8V			±10	μA
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= -1.5A		72	90	mΩ
		V_{GS}=-2.5V, I_D= -1A		98	130	
V_{SD}	Diode Forward Voltage	I_S=-1A, V_{GS}=0V		-0.7	-1.4	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=-6V, V_{GS}=-4.5V, I_D=-1.5A		5.5		nC
Qgs	Gate-Source Charge			1.5		
Qgd	Gate-Drain Charge			1.3		
Ciss	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1.0MHz		510		pF
Coss	Output Capacitance			53		
Crss	Reverse Transfer Capacitance			17		
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=-6V, R_L=6Ω R_{GEN}=6Ω, V_{GS}=-4.5V		1360		ns
t_r	Turn-On Rise Time			831		
$t_{d(off)}$	Turn-Off Delay Time			5520		
t_f	Turn-Off Fall time			1520		

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

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

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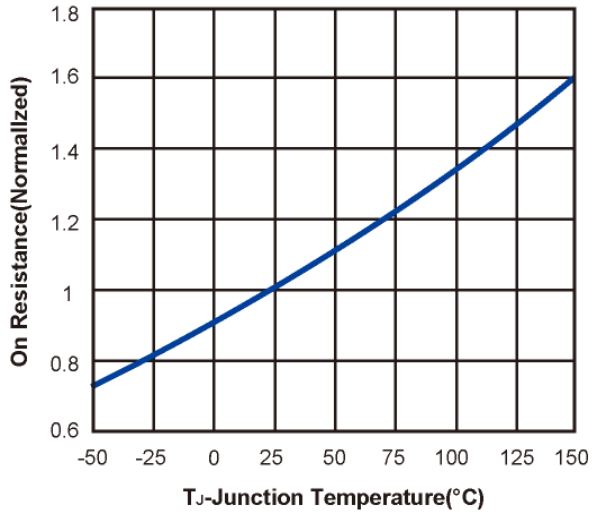
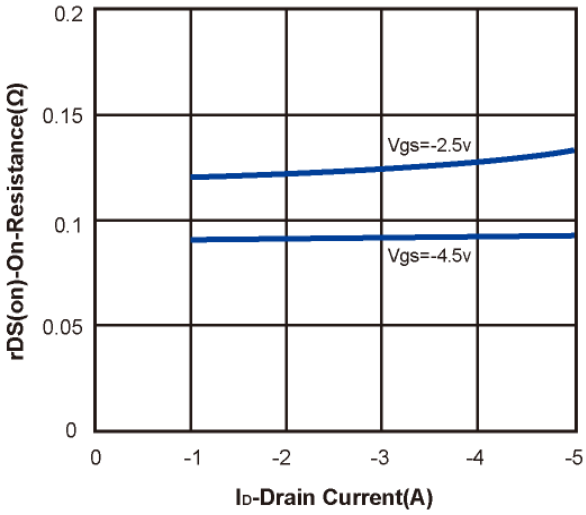
Typical Characteristics (T_J =25℃ Noted)

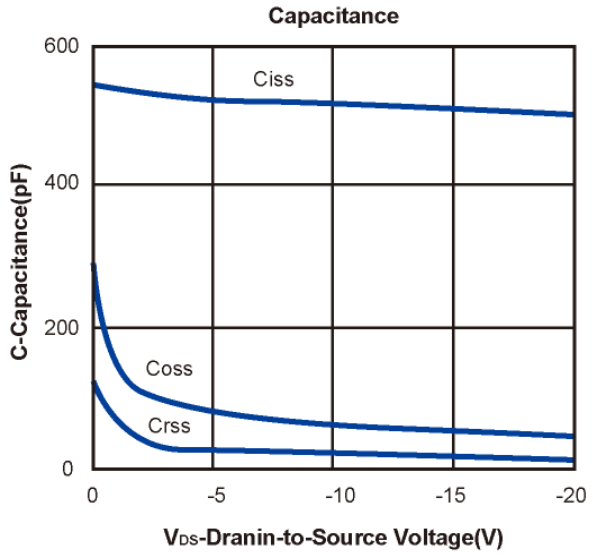
On Resistance vs. Junction Temperature



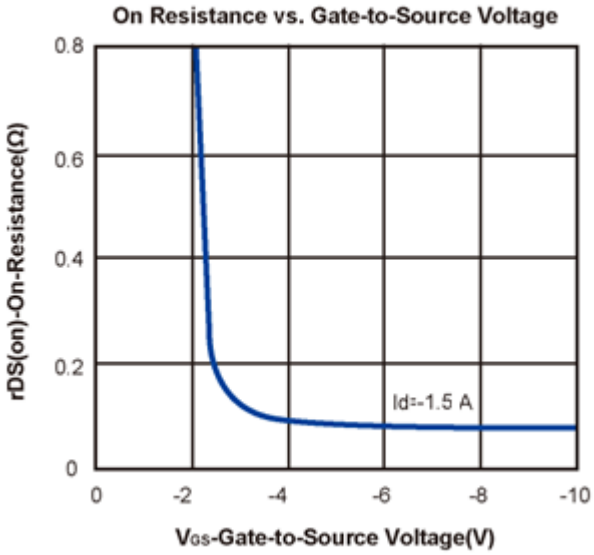
On Resistance vs. Drain Current



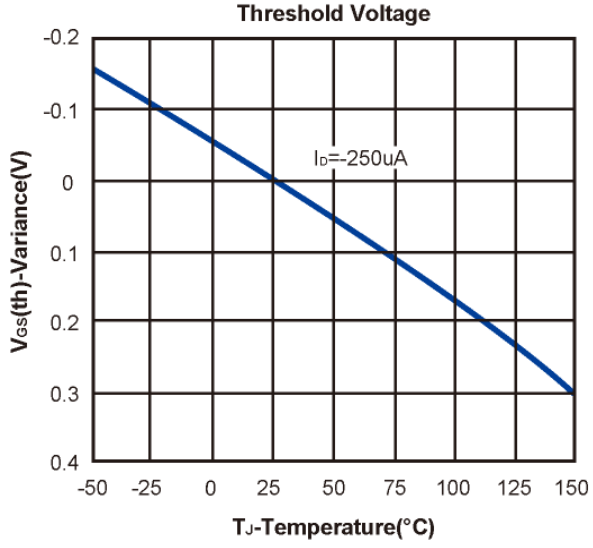
Capacitance



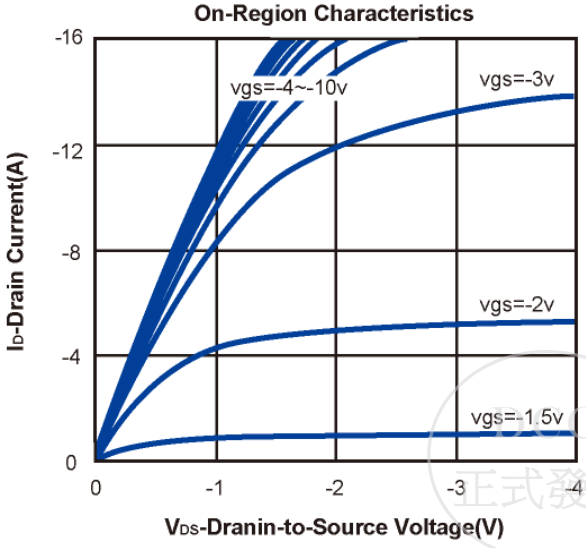
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage



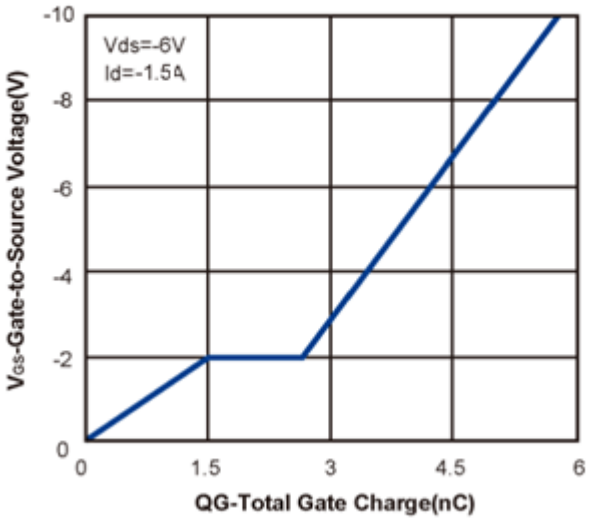
On-Region Characteristics



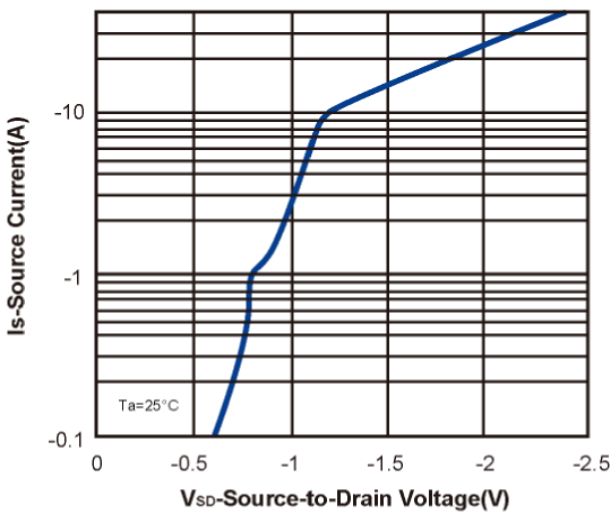
P-Channel 20V(D-S) MOSFET, ESD Protected

Typical Characteristics (T_J =25℃ Noted)

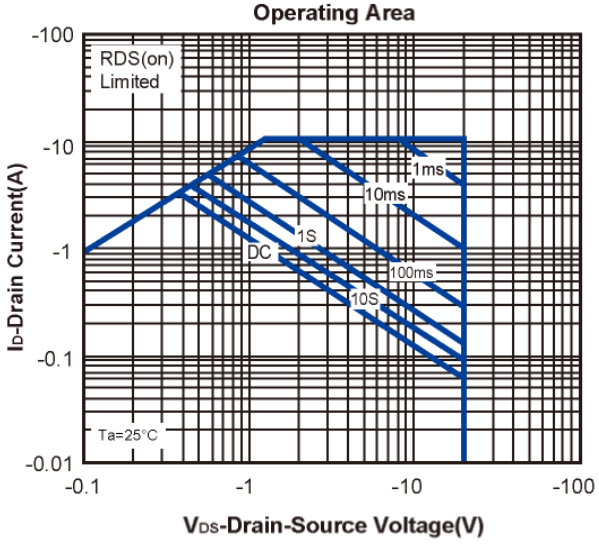
Gate Charge



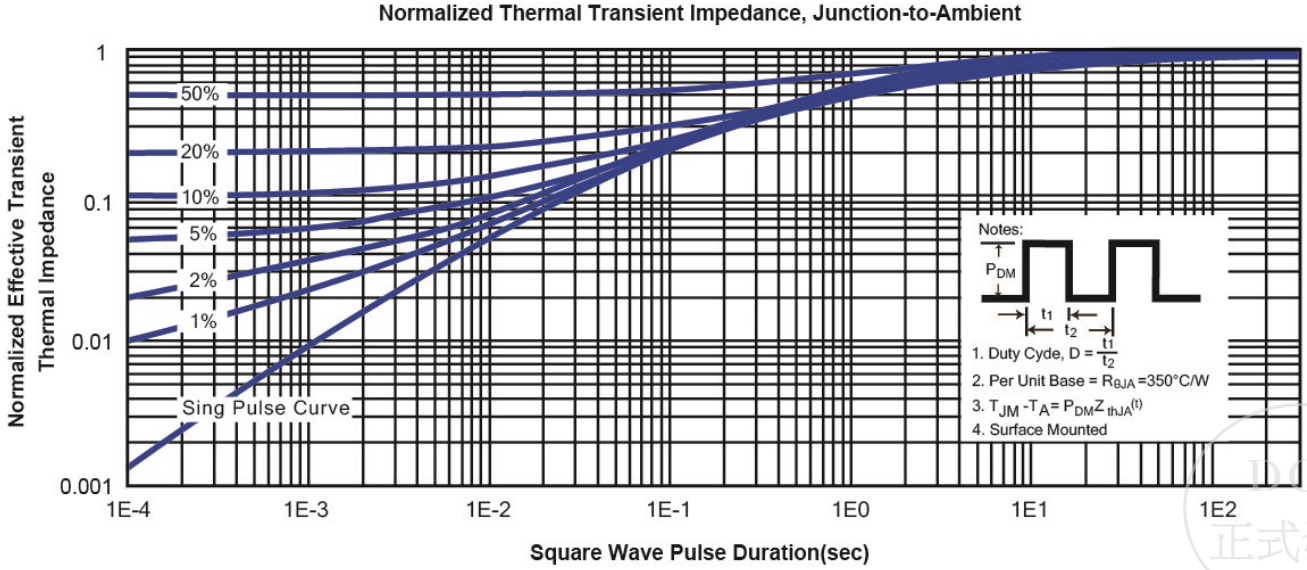
Body-diode characteristics



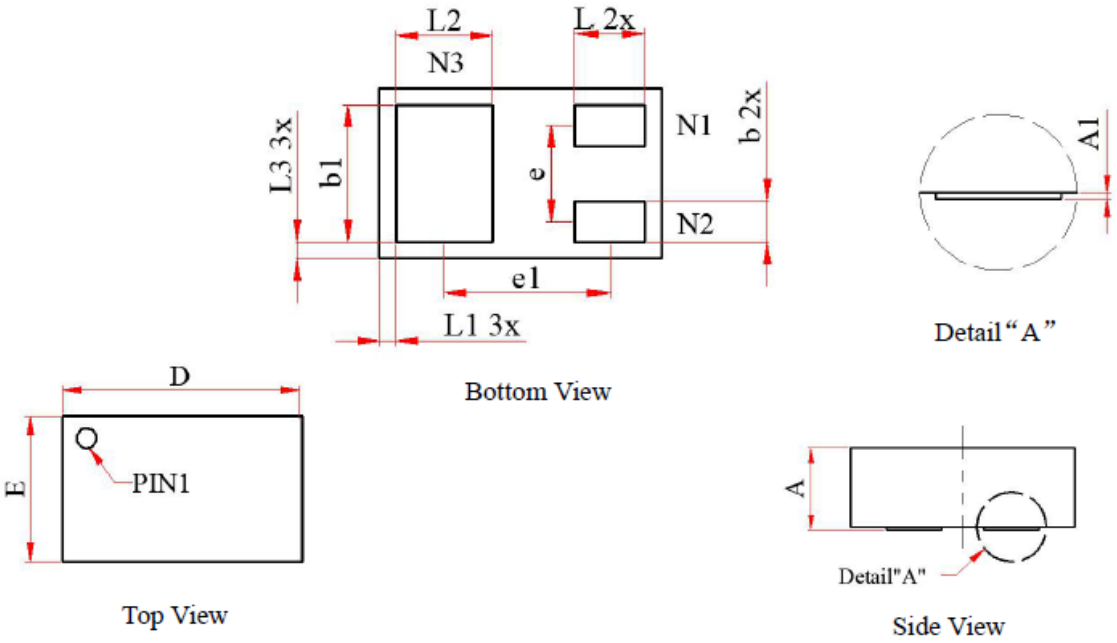
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



DFN1006-3L Package Outline



Symbol	Dimension In Millimeters		
	Normal	Min	Max
A	--	0.400	0.500
A1	--	--	0.005
D	1.020	0.990	1.050
E	0.620	0.590	0.650
b	0.150	0.100	0.200
b1	0.500	0.450	0.550
L	0.250	0.200	0.300
L1	0.060	0.020	0.100
L2	0.250	0.200	0.300
L3	0.060	0.020	0.100
e	0.350 BSC		
e1	0.650 BSC		