N-Channel MOSFET

GENERAL DESCRIPTION

The ME2N7002E-G is the N-Channel enhancement mode field effect transistors are produced using high cell density DMOS technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. They can be used in most applications requiring up to 300mA DC and can deliver pulsed currents up to 1.2A. These products are particularly suited for low voltage, low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

FEATURES

- 60V / 0.50A , $R_{DS(ON)}$= 5.0Ω@VGS=10V
- 60V / 0.30A , $R_{DS(ON)}$= 5.5Ω@VGS=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

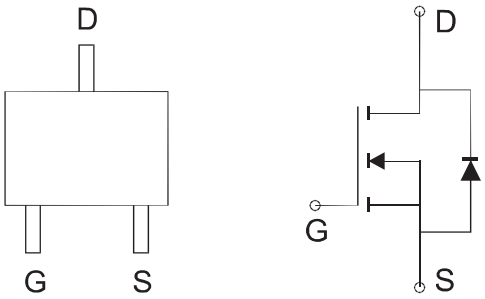
APPLICATIONS

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability.
- The soldering temperature and time shall not exceed 260℃ for more than 10 seconds.

PIN CONFIGURATION

(SOT-23)

Top View



Maximum ratings and electrical characteristic

Ratings at 25°C ambient temperature unless otherwise specified

Symbol	PARAMETER		Typical	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage - Continuous		±20	V
V_{GSS}	Gate-Source Voltage - Non Repetitive (tp < 50μs)		±40	V
I_D	Drain Current - Continuous (T_J=150°C)	T_A=25°C	300	mA
	- Pulsed (Note 1)		1200	
P_D	Power Dissipation	T_A=25°C	350	mW
T_J , T_{STG}	Operating and Storage Temperature Range		-55 ~ +150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		375	°C/W

Note :

1. Pulse width limited by safe operating area

N-Channel MOSFET

Maximum ratings and electrical characteristic

Ratings at 25°C ambient temperature unless otherwise specified

Symbol	Ratings	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V, I_D=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =60V, V_{GS} =0V V_{DS} =60V, V_{GS} =0V T_J=125°C	-	-	1 10	μA
I_{GSSF}	Gate-Body Leakage, Forward	V_{DS} =0V, V_{GS} = 20V	-	-	100	nA
I_{GSSR}	Gate-Body Leakage, Reverse	V_{DS} =0V, V_{GS} = -20V	-	-	-100	nA
ON CHARACTERISTIC (Note1)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D=250μA	1	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10V, I_D=500mA V_{GS} = 4.5V, I_D=300mA	-	2.5 3.3	5 5.5	Ω
I_{SD}	Source-drain Current		-	-	0.35	A
I_{SDM}(2)	Source-drain Current (pulsed)		-	-	1.4	A
G_{FS}(1)	Forward Trans-conductance	V_{DS}=10V , I_D=500mA	-	0.6	-	S
V_{SD}(1)	Diode Forward Voltage	V_{GS} = 0V , I_S=120mA	-	0.85	1.5	V
DYNAMIC CHARACTERISTICS						
C_{ISS}	Input Capacitance	V_{DS} =25V,V_{GS} =0V, F=1.0MHz	-	43	-	pF
C_{OSS}	Output Capacitance		-	20	-	
C_{RSS}	Reverse Transfer Capacitance		-	6	-	
Q_G	Total Gate Charge	V_{DD} =30V, I_D=1A ,V_{GS} = 5V	-	1.4	2.0	nC
Q_{GS}	Gate-Source Charge		-	0.8	-	
Q_{GD}	Gate-Drain Charge		-	0.5	-	
$TD_{(ON)}$	Turn-On Time	V_{DD} =30V,R_G =4.7Ω, I_D=500mA V_{GS} = 4.5V	-	6	-	nS
T_R			-	5	-	
$TD_{(OFF)}$	Turn-Off Time		-	15	-	
T_R			-	6	-	

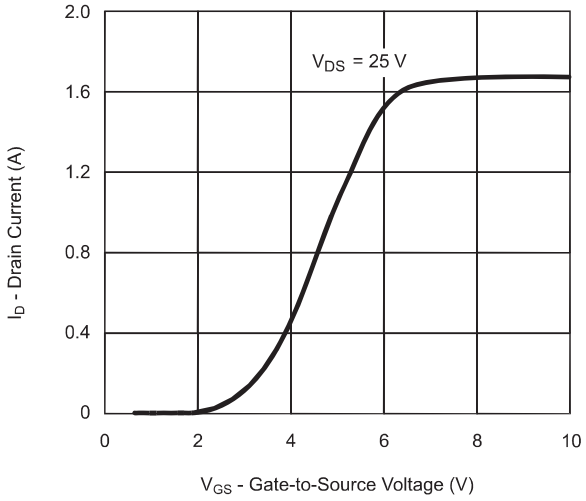
(1) Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %.

(2) Pulse width limited by safe operating area.

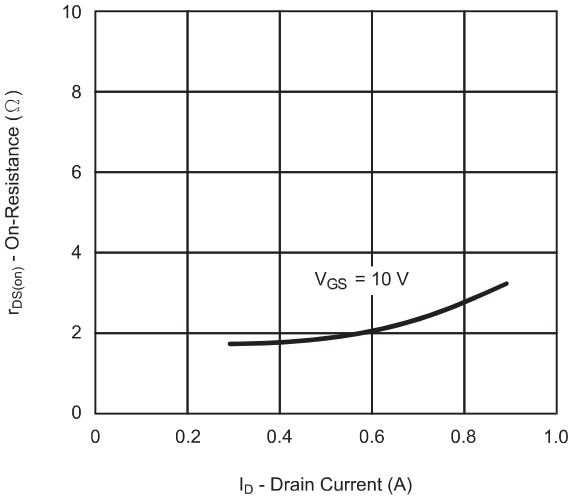
N-Channel MOSFET

Typical Characteristics (T_J =25℃ Noted)

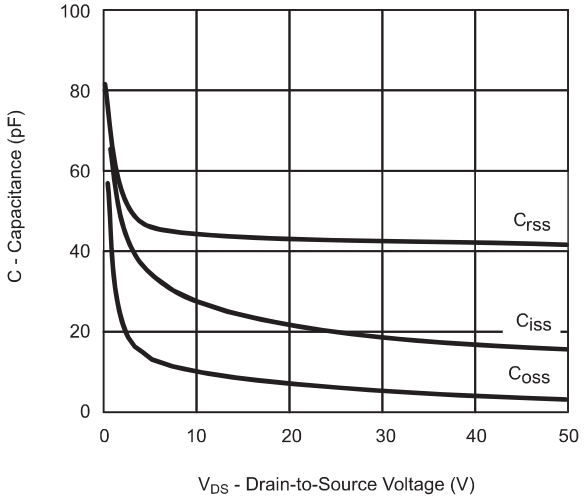
Transfer Characteristics



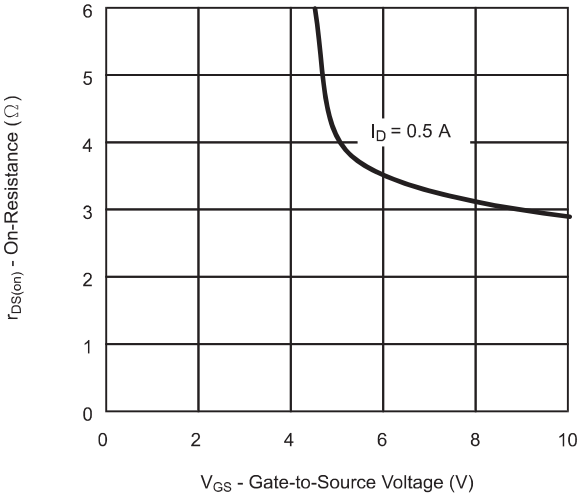
On-Resistance vs. Drain Current



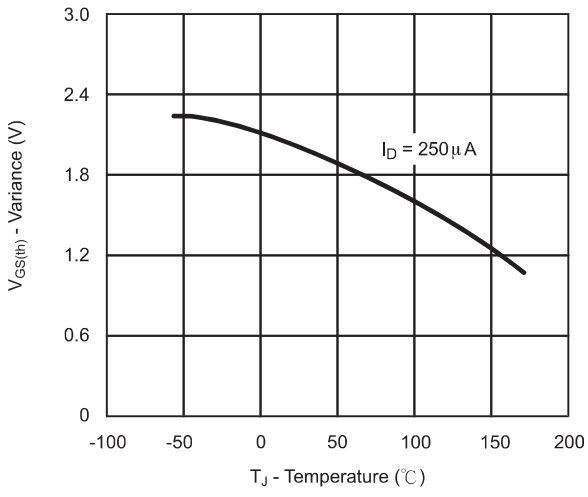
Capacitance



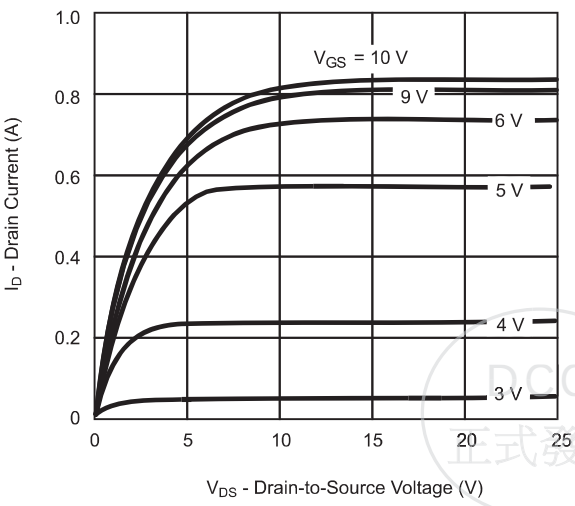
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



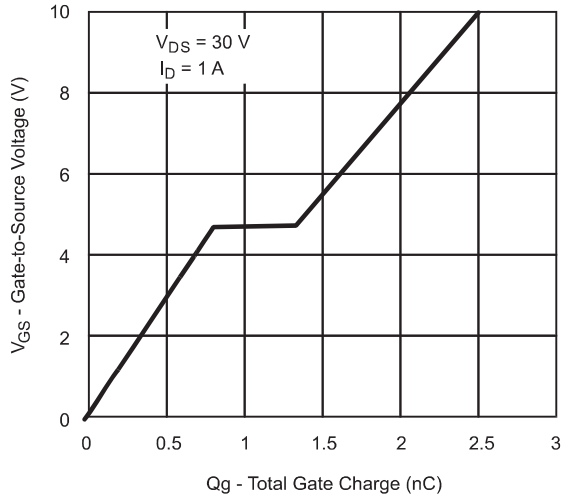
On-Region Characteristics



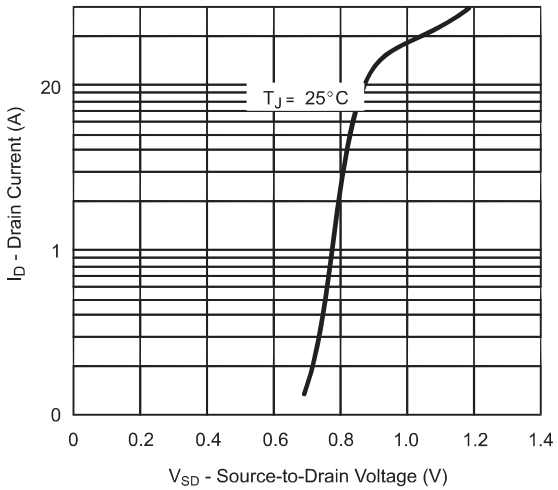
N-Channel MOSFET

Typical Characteristics (T_J =25℃ Noted)

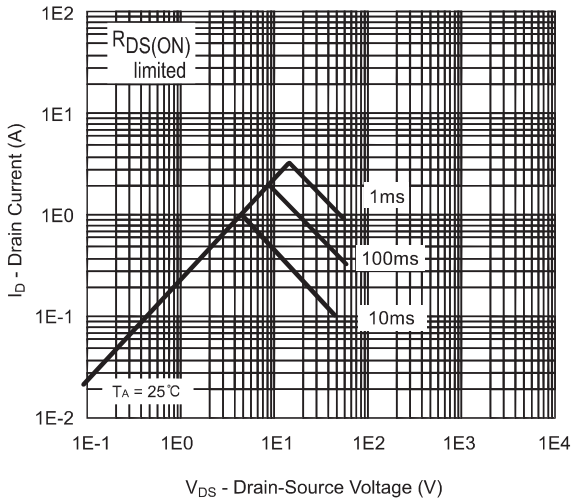
Gate Charge



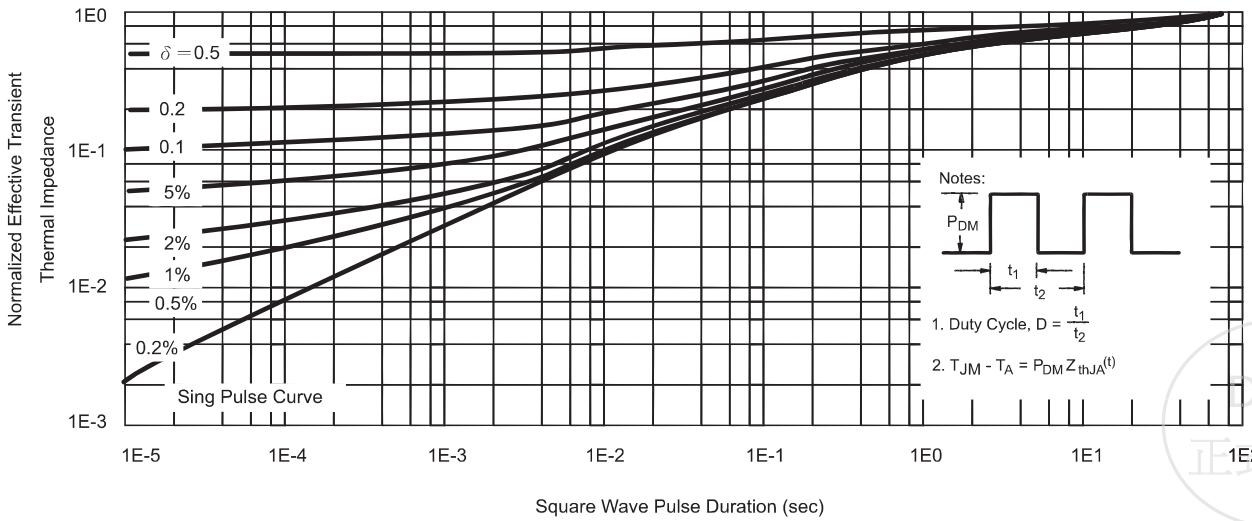
On-Resistance vs. Drain Current



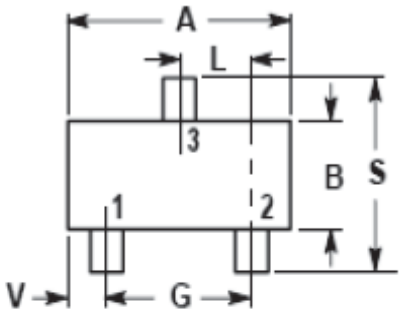
Maximum Forward Biased Safe Operating Area

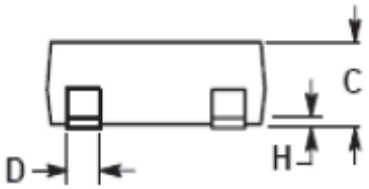


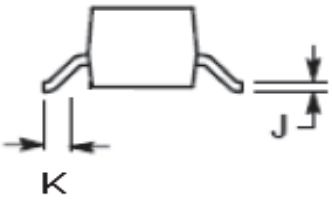
Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-23 Package Outline



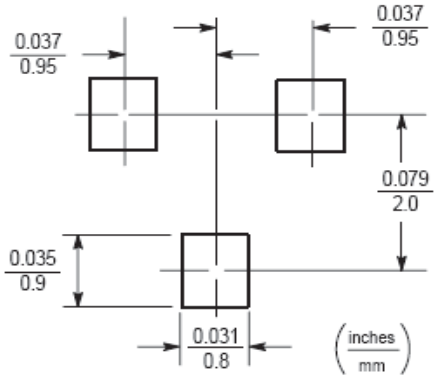




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.5
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.007	–	0.018	–
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

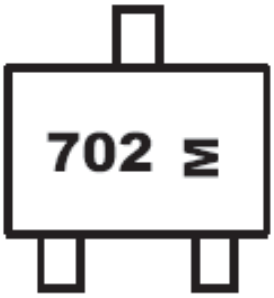
SOLDERING FOOTPRINT*



Device name: ME2N7002E-G

Package: SOT-23

Marking Code :



702 : Device number

M : Date code

MONTH CODE

ODD YEARS(2007, 2009)

Jan	1
Feb	2
Mar	3
Apr	4
May	5
Jun	6
Jul	7
Aug	8
Sep	9
Oct	T
Nov	V
Dec	C

EVEN YEARS(2006,2008)

Jan	E
Feb	F
Mar	H
Apr	J
May	K
Jun	L
Jul	N
Aug	P
Sep	U
Oct	X
Nov	Y
Dec	Z