N-Channel 30V (D-S) MOSFET

GENERAL DESCRIPTION

The ME7802-G 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 Low-side switching , and low in-line power loss are needed in a very small outline surface mount package.

FEATURES

- $R_{DS(ON)} \leqq 4.6m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 6.8m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

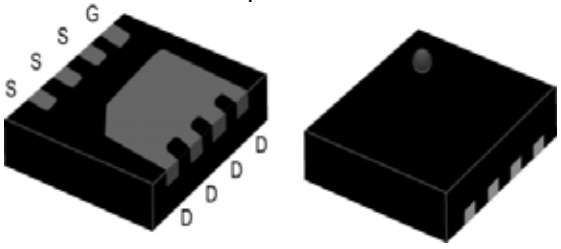
APPLICATIONS

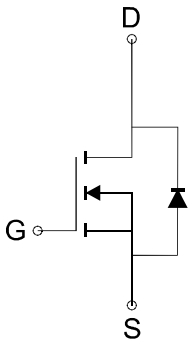
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch

PIN CONFIGURATION

(DFN 3.3x3.3)

Top View





N-Channel MOSFET

Ordering Information: ME7802-G (Green product-Halogen free)

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*	T_C=25℃	I_D	84	A
	T_C=70℃		67	
	T_A=25℃		22.7	
	T_A=70℃		18.2	
Pulsed Drain Current		I_{DM}	91	A
Maximum Power Dissipation*	T_C=25℃	P_D	52	W
	T_C=70℃		33	
	T_A=25℃		3.8	
	T_A=70℃		2.4	
Operating Junction Temperature		T_J	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	Typ 26 Max 33	℃/W
Thermal Resistance-Junction to Case*		$R_{\theta JC}$	Typ 1.9 Max 2.4	℃/W

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

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Electrical Characteristics (T_A=25°C Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
$V_{(BR)DSS}$	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	1.0		3.0	V
I_{GSS}	Gate 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[a]	V_{GS}=10V, I_D=20A		3.7	4.6	mΩ
		V_{GS}=4.5V, I_D=16A		5.4	6.8	
V_{SD}	Diode Forward Voltage	I_S=1.0A, V_{GS}=0V		0.7	1.2	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_D=20A		54		nC
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_D=20A		27		
Qgs	Gate-Source Charge			9.5		
Qgd	Gate-Drain Charge			11		
Ciss	Input Capacitance	V_{DS}=15V, V_{GS}=0V, F=1MHz		2450		pF
Coss	Output Capacitance			393		
Crss	Reverse Transfer Capacitance			129		
Rg	Gate-Resistance	V_{DS}=0V, V_{GS}=0V, F=1MHz		1.8		Ω
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=15V, R_L=15Ω, V_{GEN}=10V, R_G=3Ω		23		ns
t_r	Turn-On Rise Time			16		
$t_{d(off)}$	Turn-Off Delay Time			7		
t_f	Turn-Off Fall Time			12		

Note: 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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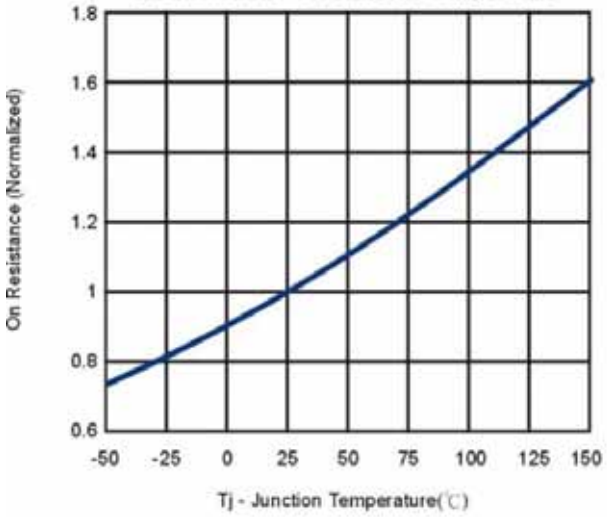
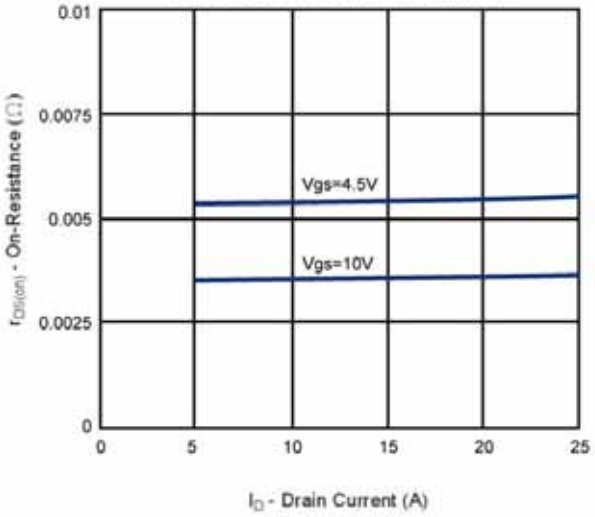
Typical Characteristics (T_J =25℃ Noted)

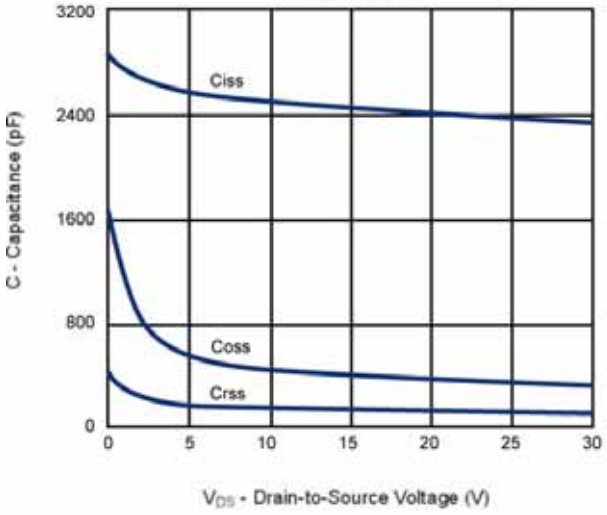
On Resistance vs. Junction Temperature



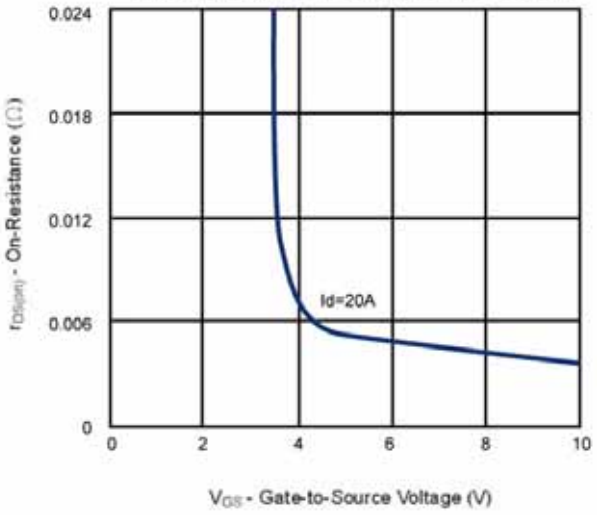
On-Resistance vs. Drain Current



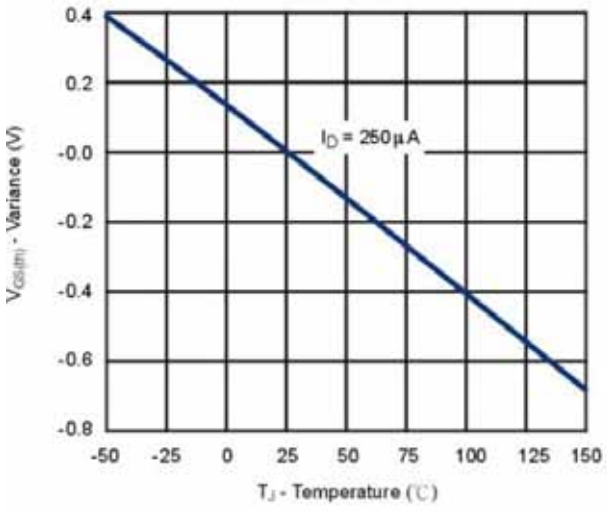
Capacitance



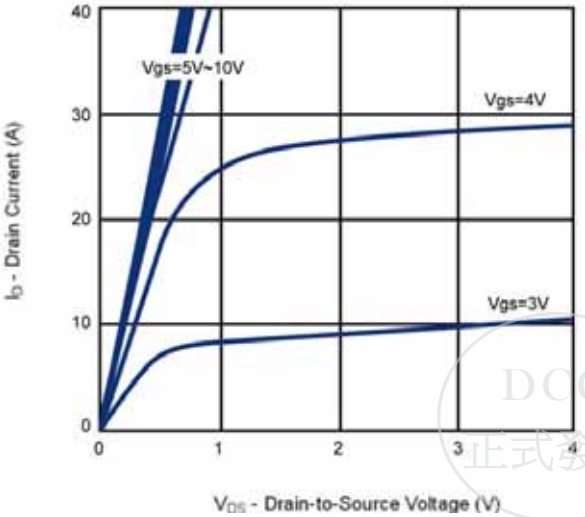
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



On-Region Characteristics



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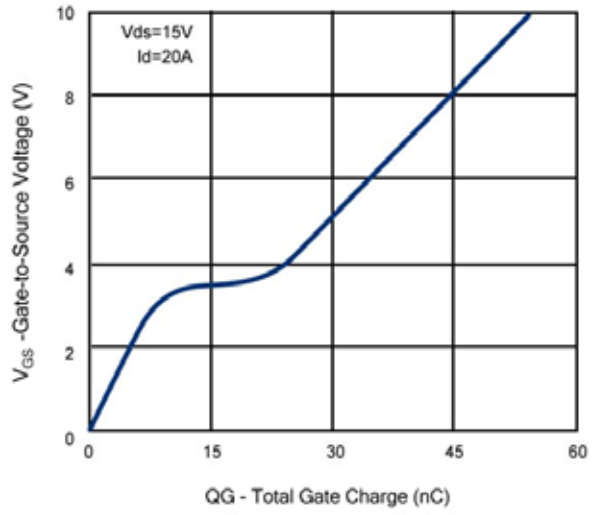
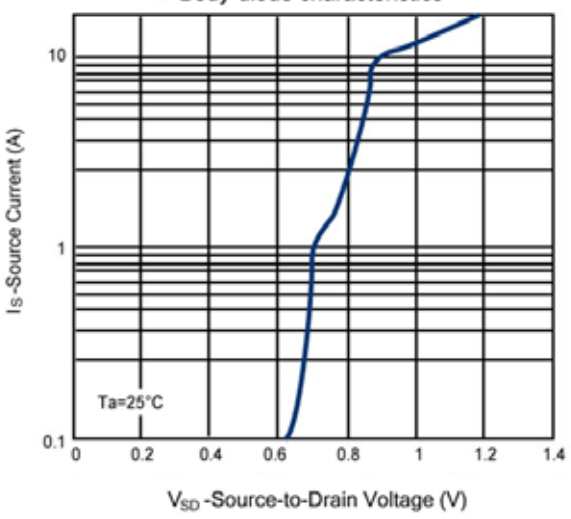
Typical Characteristics (T_J =25℃ Noted)

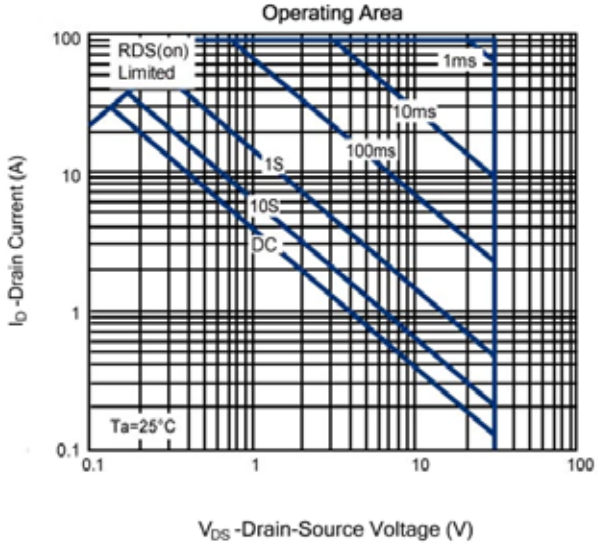
Gate Charge



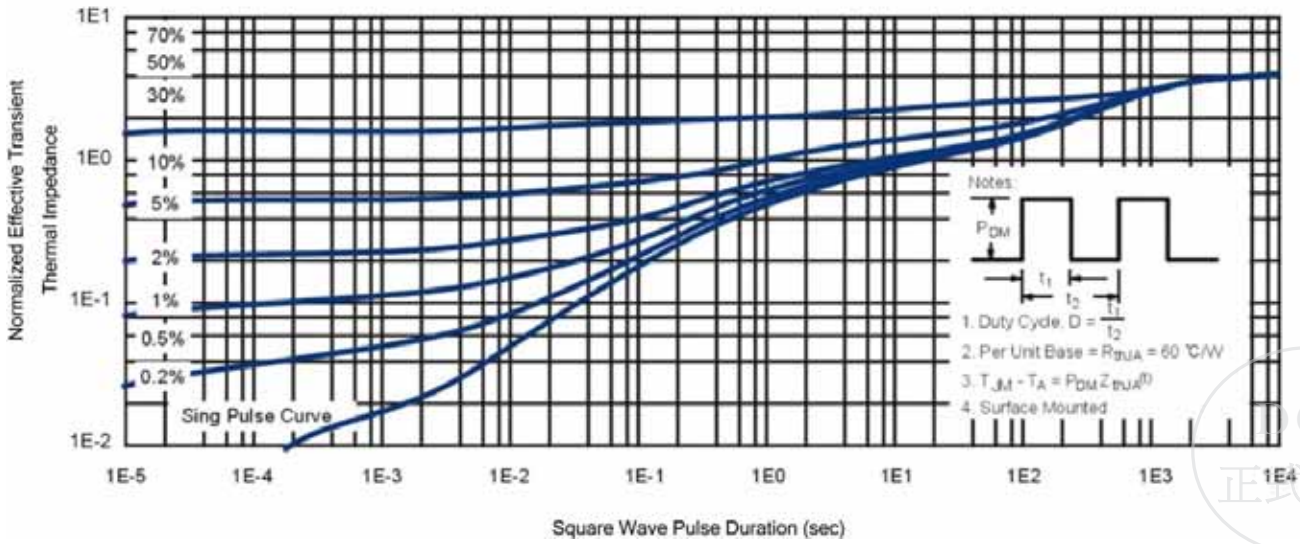
Body-diode characteristics



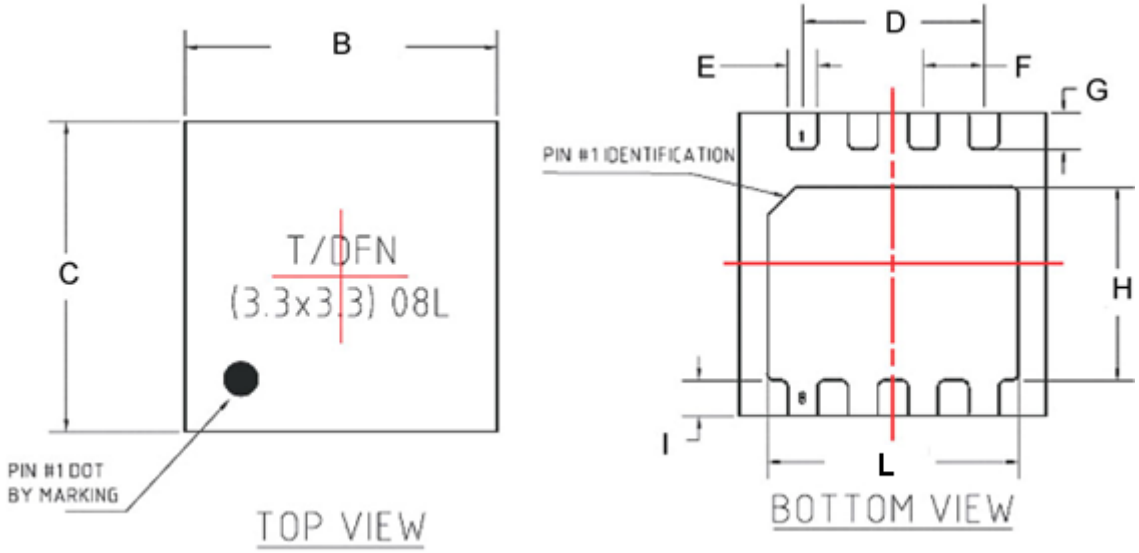
Maximum Forward Biased Safe Operating Area

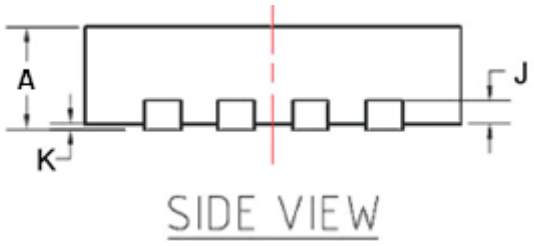


Normalized Thermal Transient Impedance, Junction-to-Ambient



PowerDFN 3.3x3.3 Package Outline





SYMBOL	MILLIMETERS (mm)	
	MIN	MAX
A	0.700	1.000
B	3.250	3.350
C	3.250	3.350
D	1.95REF.	
E	0.270	0.370
F	0.65BSC	
G	0.350	0.450
H	2.050	2.150
I	0.340	0.440
J	0.195	0.211
K	0.000	0.050
L	2.650	2.750