Dual P-Channel 20-V (D-S) MOSFET

GENERAL DESCRIPTION

The ME3981 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 high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

FEATURES

- $R_{DS(ON)} \leqq 62m\Omega @ V_{GS}=-4.5V$
- $R_{DS(ON)} \leqq 80m\Omega @ V_{GS}=-2.5V$
- $R_{DS(ON)} \leqq 115m\Omega @ V_{GS}=-1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

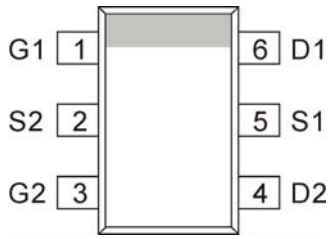
APPLICATIONS

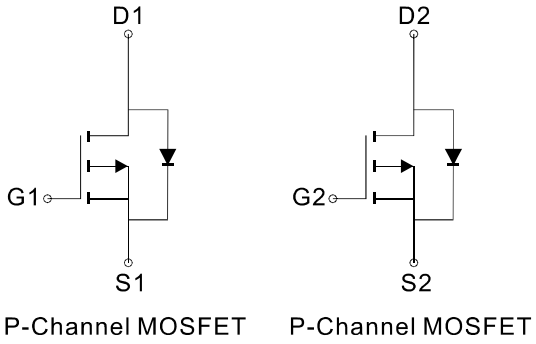
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION

(TSOP-6)

Top View





P-Channel MOSFET P-Channel MOSFET

Ordering Information: ME3981 (Pb-free)

ME3981-G (Green product-Halogen free)

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

Parameter		Symbol	Steady State	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±8	V
Continuous Drain Current(Tj=150℃)*	T_A=25℃	I_D	-3.6	A
	T_A=70℃		-2.9	
Pulsed Drain Current		I_{DM}	-14	A
Avalanche Current		I_{AR}	-9	A
Avalanche Energy with Single Pulse(L=0.1mH)		E_{AS}	4.05	mJ
Maximum Power Dissipation*	T_A=25℃	P_D	1.3	W
	T_A=70℃		0.8	
Operating Junction Temperature		T_J	-55 to 150	℃
Thermal Resistance-Junction to Case*		$R_{\theta JC}$	96	℃/W

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

Dual P-Channel 20-V (D-S) MOSFET

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	-0.5		-1.0	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±8V			±100	nA
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= -1.9A		50	62	mΩ
		V_{GS}=-2.5V, I_D= -1.6A		65	80	
		V_{GS}=-1.8V, I_D= -0.7A		90	115	
V_{SD}	Diode Forward Voltage	I_S=-1.9A, V_{GS}=0V		-0.7	-1.2	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=-15V, V_{GS}=-10, I_D=-4.2A		19		nC
Qg	Total Gate Charge	V_{DS}=-15V, V_{GS}=-4.5, I_D=-4.2A		9.2		
Qgs	Gate-Source Charge			1.6		
Qgd	Gate-Drain Charge			4.1		
Ciss	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz		643		pF
Coss	Output Capacitance			71		
Crss	Reverse Transfer Capacitance			23		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V, R_L =15Ω V_{GEN}=-10V,R_G=6Ω		33		ns
t_r	Turn-On Rise Time			19		
$t_{d(off)}$	Turn-Off Delay Time			54		
t_f	Turn-Off Fall Time			5		

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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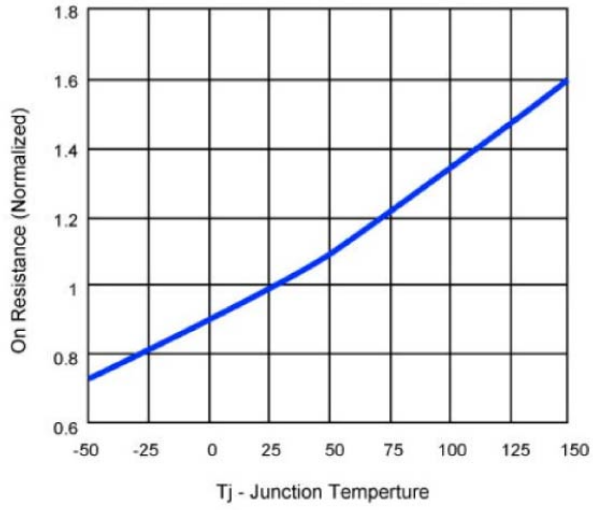
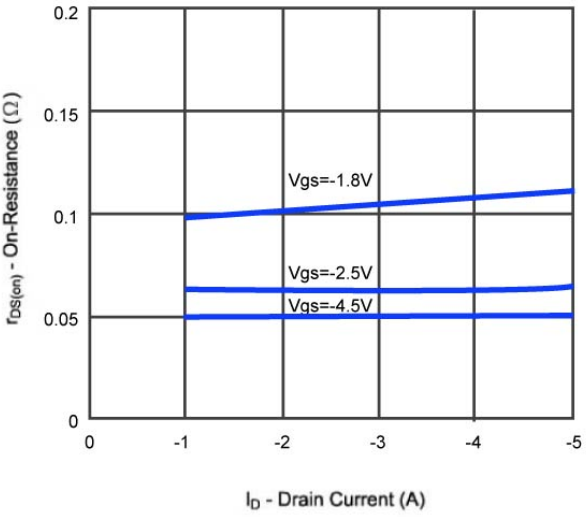
Typical Characteristics (T_J =25℃ Noted)

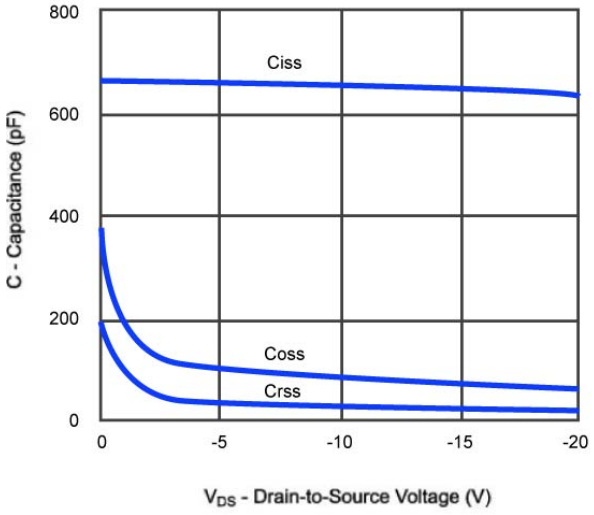
On Resistance vs. Junction Temperture



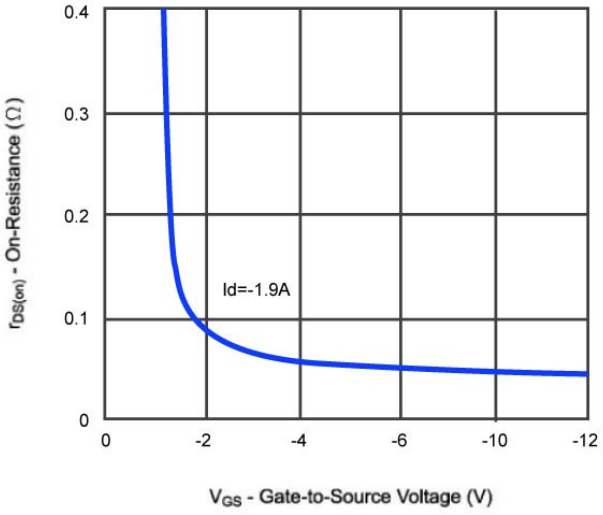
On-Resistance vs. Drain Current



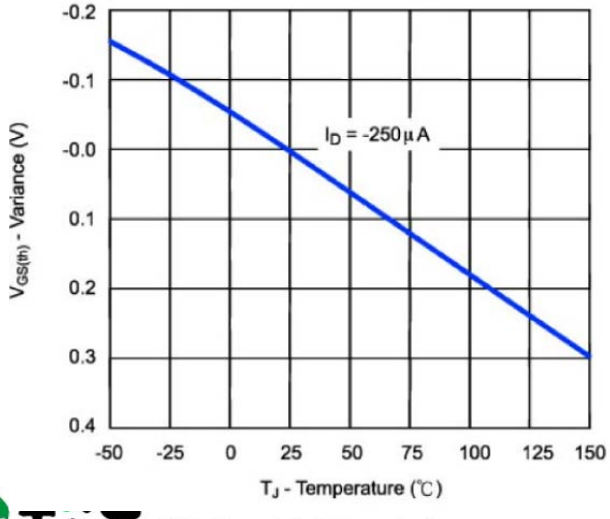
Capacitance



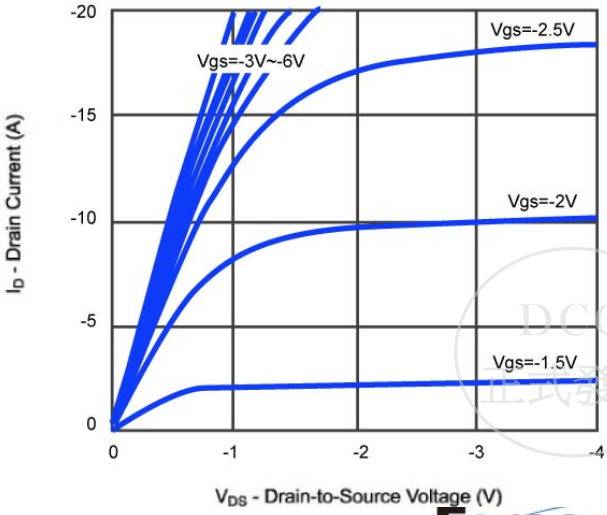
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



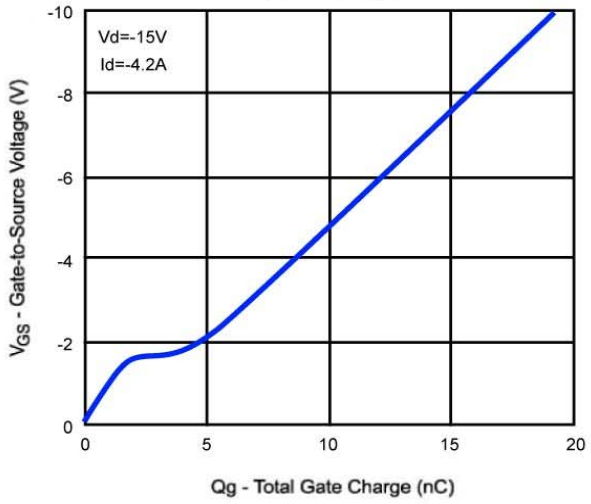
On-Region Characteristics



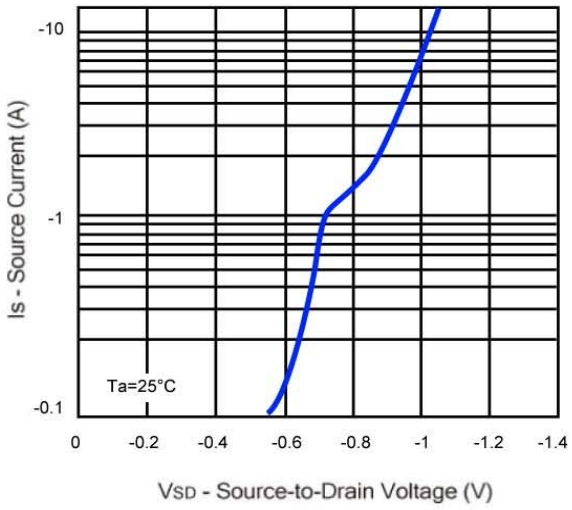
Dual P-Channel 20-V (D-S) MOSFET

Typical Characteristics (T_J =25℃ Noted)

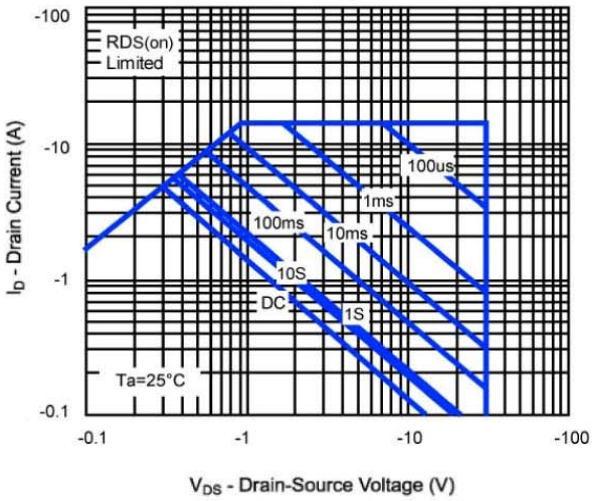
Gate Charge



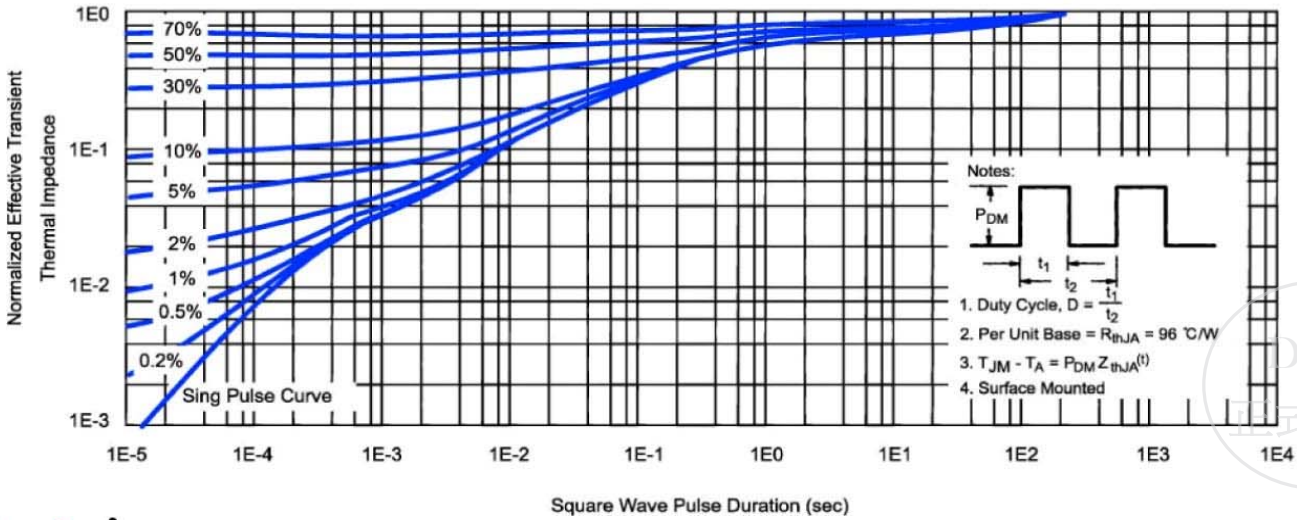
Body-diode characteristics



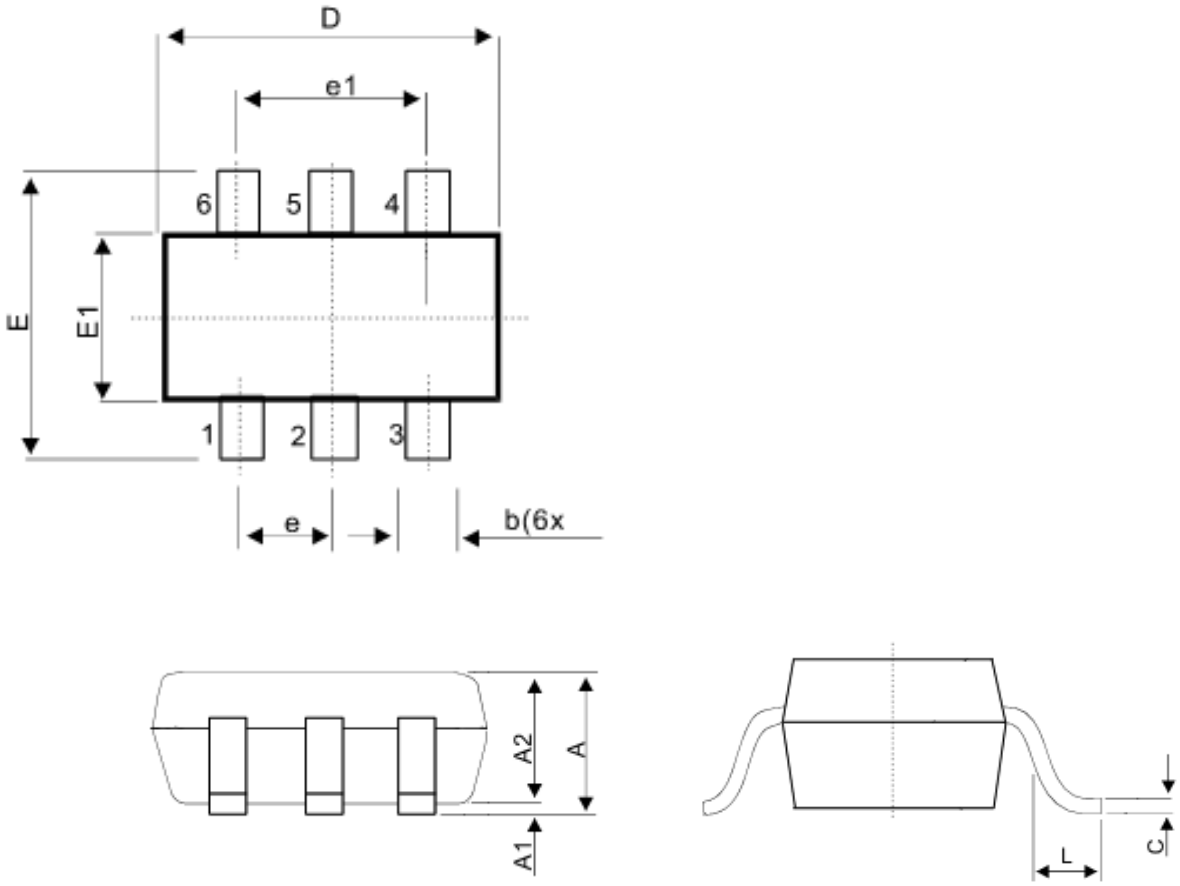
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



TSOP-6 Package Outline



SYMBOL	MILLIMETERS (mm)	
	MIN	MAX
A	0.90	1.20
A1	0.01	0.10
A2	0.90	1.15
b	0.25	0.50
C	0.10	0.20
D	2.80	3.10
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60