P-Channel 30V (D-S) MOSFET

GENERAL DESCRIPTION

The ME4435 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

- $R_{DS(ON)} \leqq 20m\Omega @ V_{GS}=-10V$
- $R_{DS(ON)} \leqq 35m\Omega @ V_{GS}=-4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

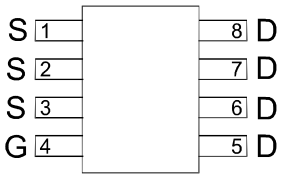
APPLICATIONS

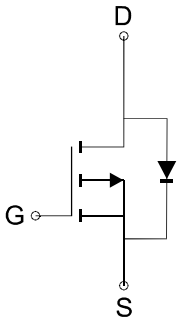
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION

(SOP-8)

Top View





P-Channel MOSFET

Ordering Information: ME4435 (Pb-free)

ME4435-G (Green product-Halogen free)

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

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DSS}	-30		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current(Tj=150℃)	T_A=25℃	I_D	-9.1	-7	A
	T_A=70℃		-7.3	-5.6	
Pulsed Drain Current		I_{DM}	-30		A
Avalanche Energy with Single Pulse(L=0.1mH)		EAS	50		mJ
Continuous Source Current (Diode Conduction)		I_S	-2.1	-1.25	A
Maximum Power Dissipation	T_A=25℃	P_D	2.5	1.5	W
	T_A=70℃		1.6	0.9	
Operating Junction Temperature		T_J	-55 to 150		℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	T≦10 sec	30	℃/W
			Steady State	62	
Thermal Resistance-Junction to Case		$R_{\theta JC}$	38		℃/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						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1	-1.4	-3	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
		V_{DS}=-30V, V_{GS}=0V T_J=55℃			-25	
$I_{D(ON)}$	On-State Drain Current[a]	V_{DS}=-5V, V_{GS}= -10V	-30			A
$R_{DS(ON)}$	Drain-Source On-State Resistance[a]	V_{GS}=-10V, I_D= -9.1A		15	20	mΩ
		V_{GS}=-4.5V, I_D= -6.9A		25	35	
V_{SD}	Diode Forward Voltage	I_S=-2.1A, V_{GS}=0V		-0.8	-1.2	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=-15V, V_{GS}=-10V, I_D=-9.1A		38	45	nC
Qgs	Gate-Source Charge			7.7		
Qgd	Gate-Drain Charge			9		
Rg	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		5.5		Ω
Ciss	Input capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz		1730	1900	pF
Coss	Output Capacitance			240		
Crss	Reverse Transfer Capacitance			70		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V, R_L =15Ω I_D=-1A, V_{GEN}=-10V R_G=6Ω		41	50	ns
t_r	Turn-On Rise Time			19	23	
$t_{d(off)}$	Turn-Off Delay Time			105	120	
t_f	Turn-On Fall Time			17	20	

Notes: 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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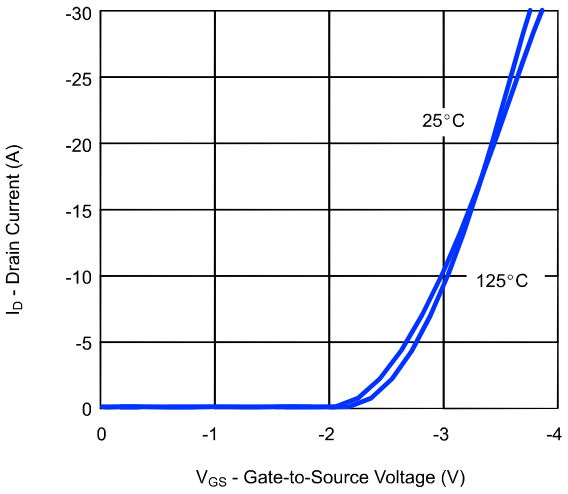
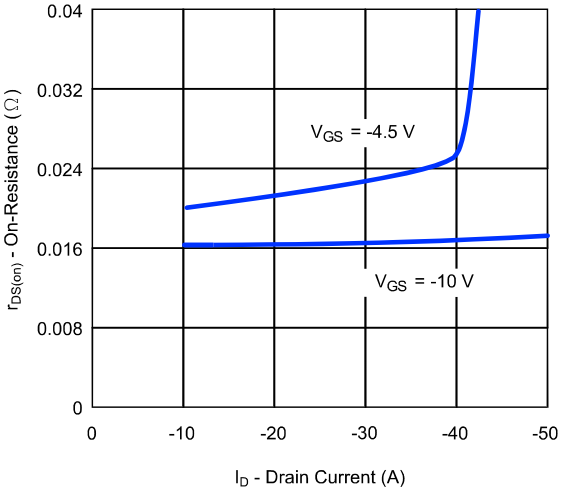
Typical Characteristics (TJ =25℃ Noted)

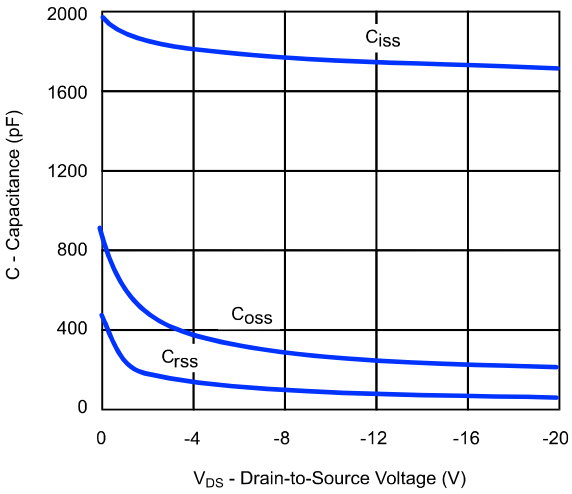
Transfer Characteristics



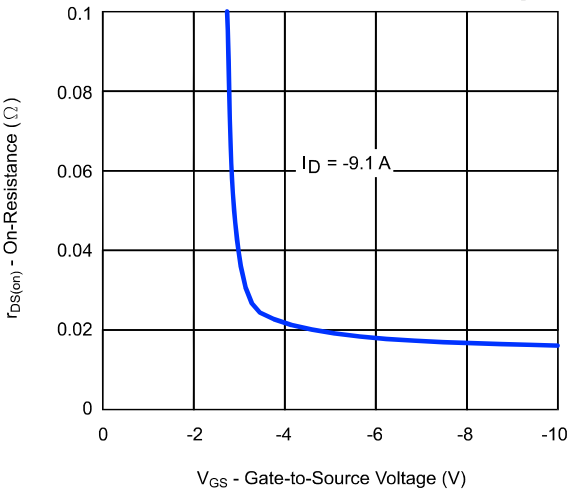
On-Resistance vs. Drain Current



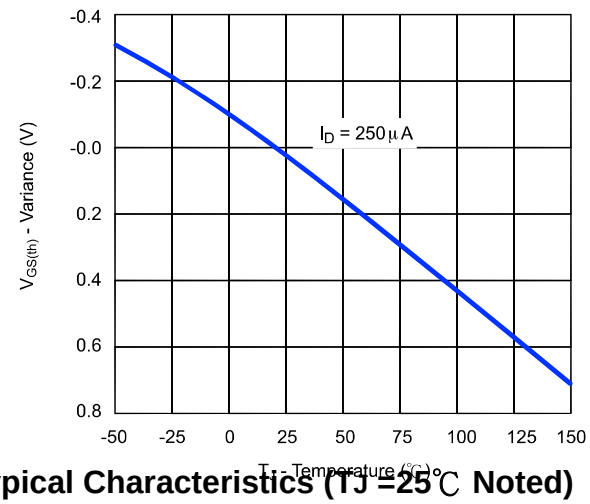
Capacitance



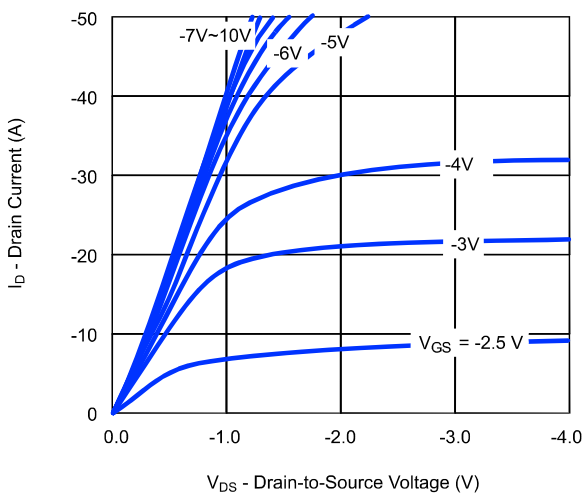
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

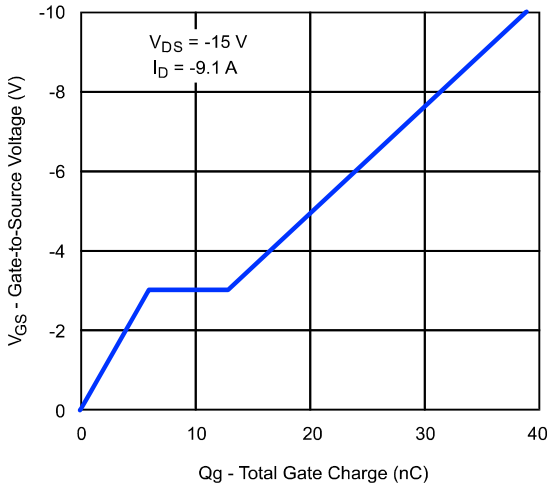


On-Region Characteristics

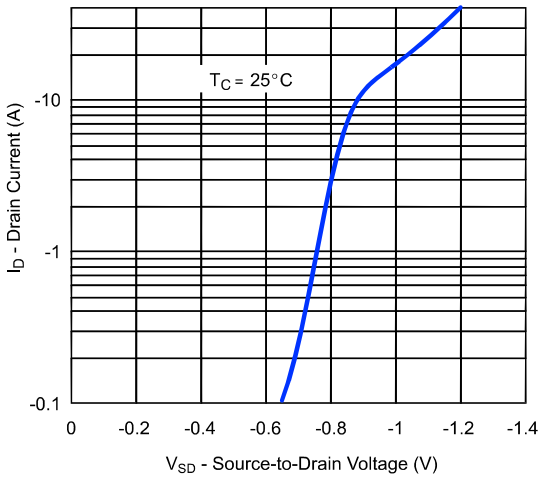


Typical Characteristics (TJ =25℃ Noted)

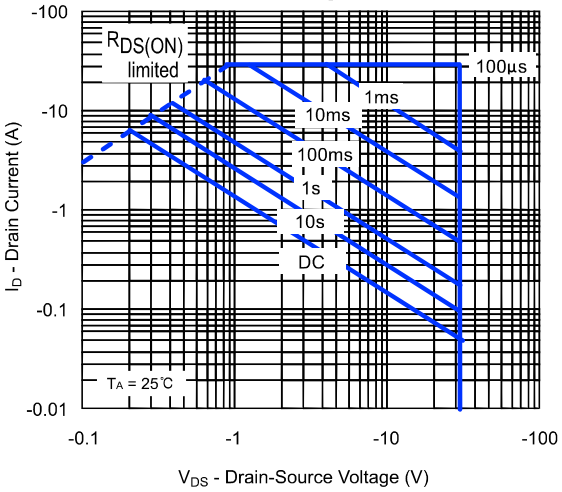
Gate Charge



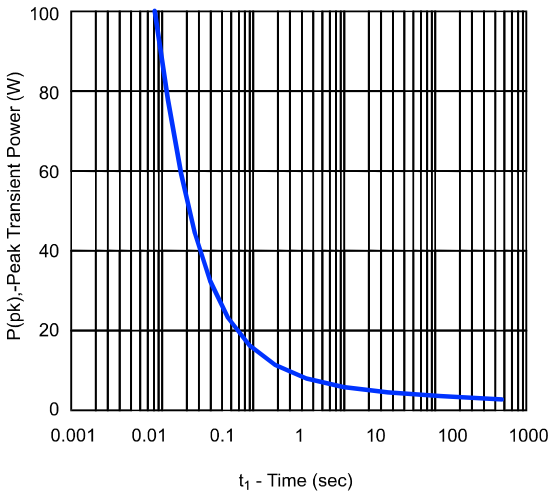
On-Resistance vs. Drain Current



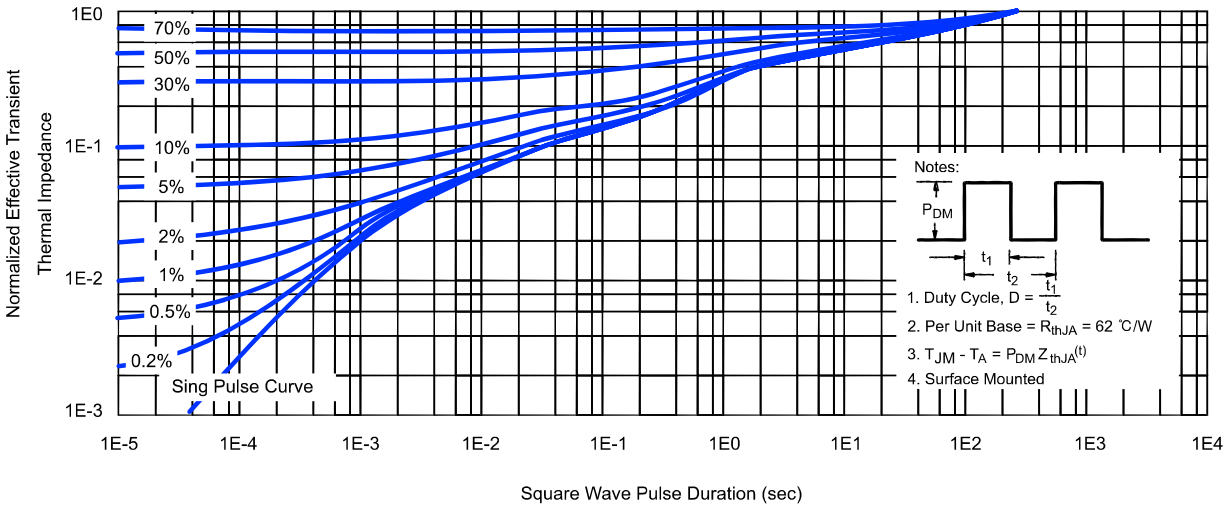
Maximum Forward Biased Safe Operating Area



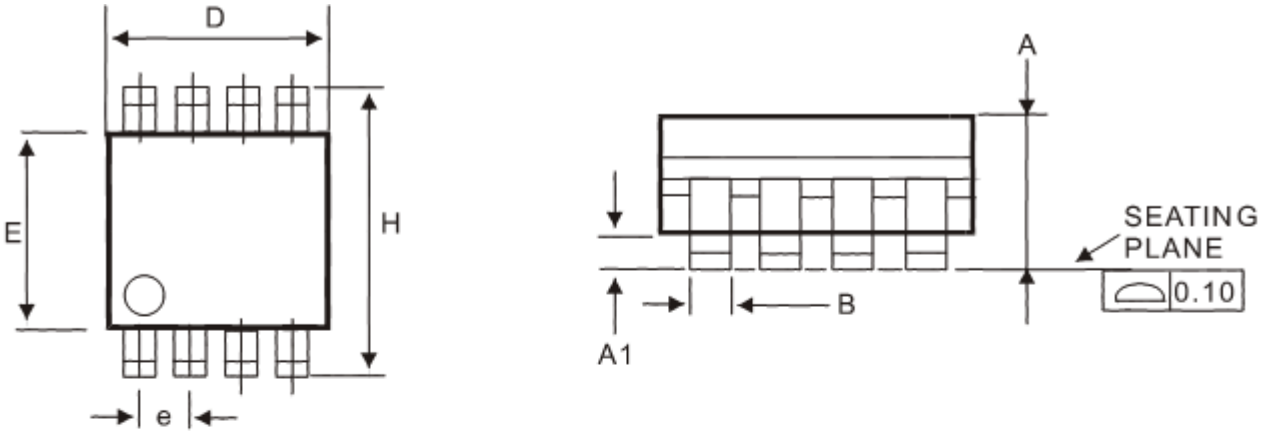
Single Pulse Maximum Power Dissipation



Normalized Thermal Transient Impedance, Junction-to-Ambient



SOP-8 Package Outline



DIM	MILLIMETERS (mm)	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
L	0.40	1.25
θ	0°	7°

Note: 1. Refer to JEDEC MS-012AA.

2. Dimension “D” does not include mold flash, protrusions or gate burrs . Mold flash, protrusions or gate burrs shall not exceed 0.15 mm per side.