

## N-Channel 30V (D-S) MOSFET , ESD Protected

### GENERAL DESCRIPTION

The RM2306E 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 high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

### FEATURES

- $R_{DS(ON)} \leq 31m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 52m\Omega @ V_{GS}=4.5V$
- ESD Protected
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

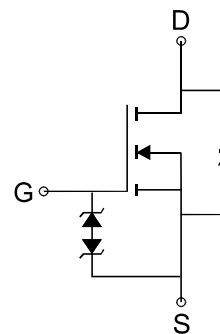
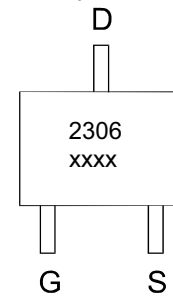
### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Load Switch

### PIN CONFIGURATION

(SOT-23)

Top View



### Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter	Symbol	Maximum Ratings	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain*	$I_D$	$T_A=25^\circ C$	5.3	A
		$T_A=70^\circ C$	4.2	
Pulsed Drain Current	$I_{DM}$	21.2	A	
Maximum Power Dissipation*	$P_D$	$T_A=25^\circ C$	1.39	W
		$T_A=70^\circ C$	0.89	
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55 to 150	$^\circ C$	
Thermal Resistance-Junction to Ambient*	$R_{\theta JA}$	90	$^\circ C/W$	

\*The device mounted on 1in<sup>2</sup> FR4 board with 2 oz copper

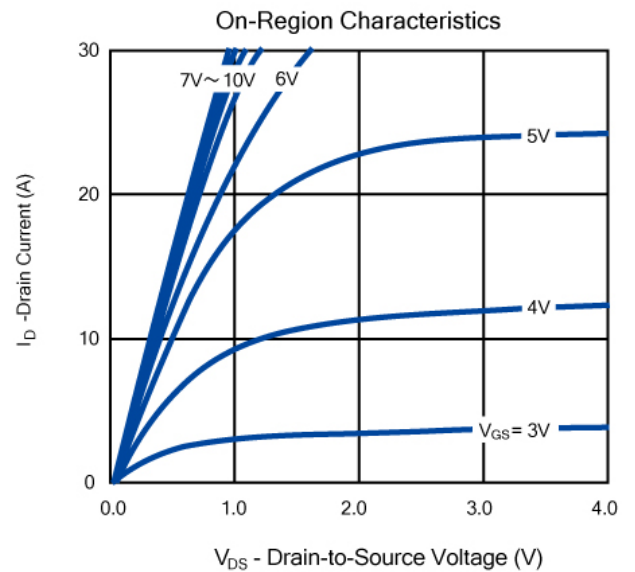
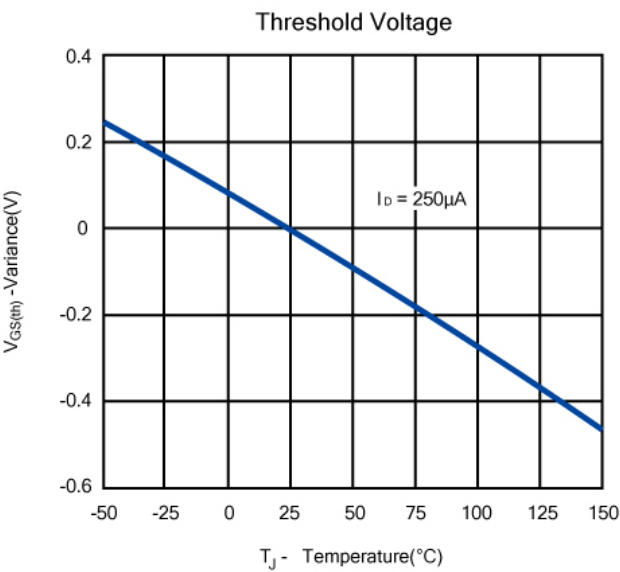
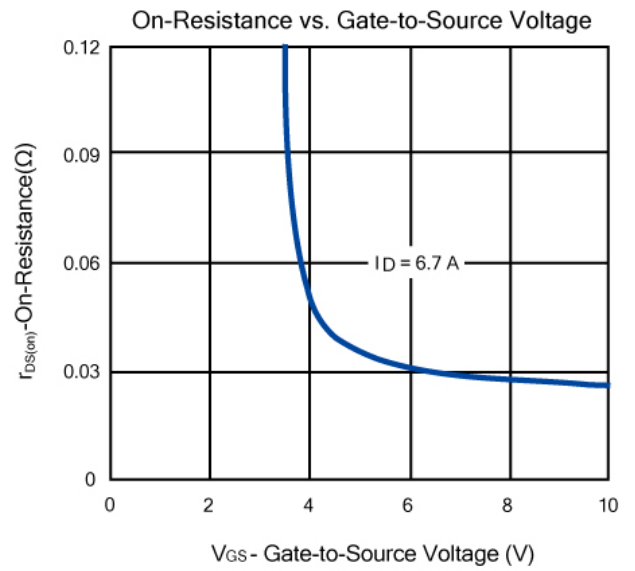
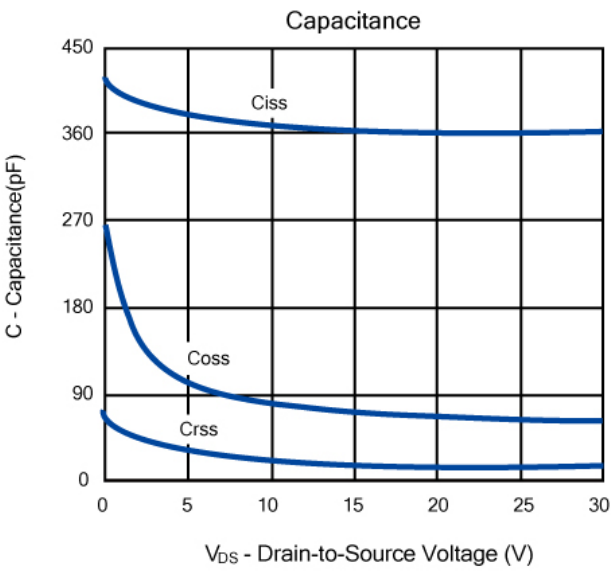
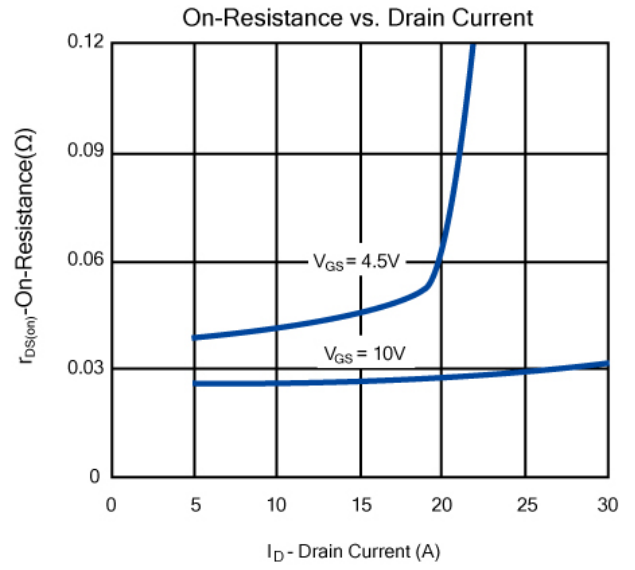
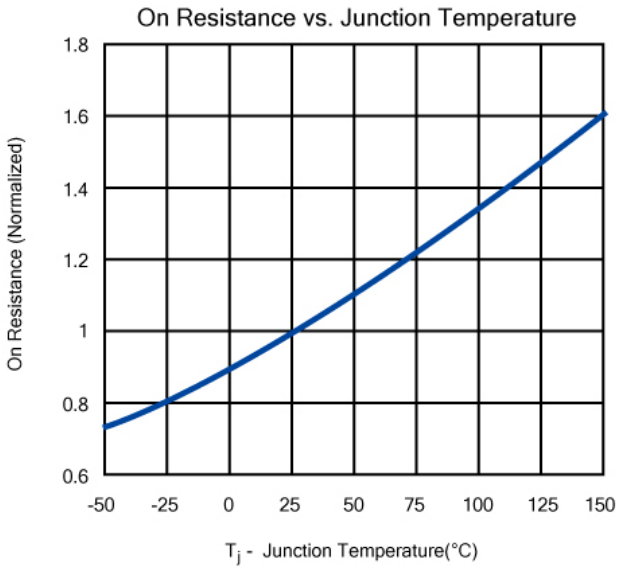
## Electrical Characteristics (T<sub>A</sub>=25°C Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
<b>STATIC</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	1	1.5	3	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±16V			±10	μA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
R <sub>DS(ON)</sub>	Drain-Source On-Resistance <sup>a</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> = 6.7A		26	31	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> = 5.0A		40	52	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>DYNAMIC</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHZ		370		pF
C <sub>oss</sub>	Output Capacitance			68		
C <sub>rss</sub>	Reverse Transfer Capacitance			21		
R <sub>g</sub>	Gate Resistance	f=1MHz		1.9		Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =6.7A		12		nC
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.7A		5.7		
Q <sub>gs</sub>	Gate-Source Charge			3.0		
Q <sub>gd</sub>	Gate-Drain Charge			2.1		
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω I <sub>D</sub> =1.0A, V <sub>GEN</sub> =10V R <sub>G</sub> =6Ω		9.2		ns
t <sub>r</sub>	Turn-On Rise Time			13		
t <sub>d(off)</sub>	Turn-Off Delay Time			33		
t <sub>f</sub>	Turn-Off Fall Time			3.7		

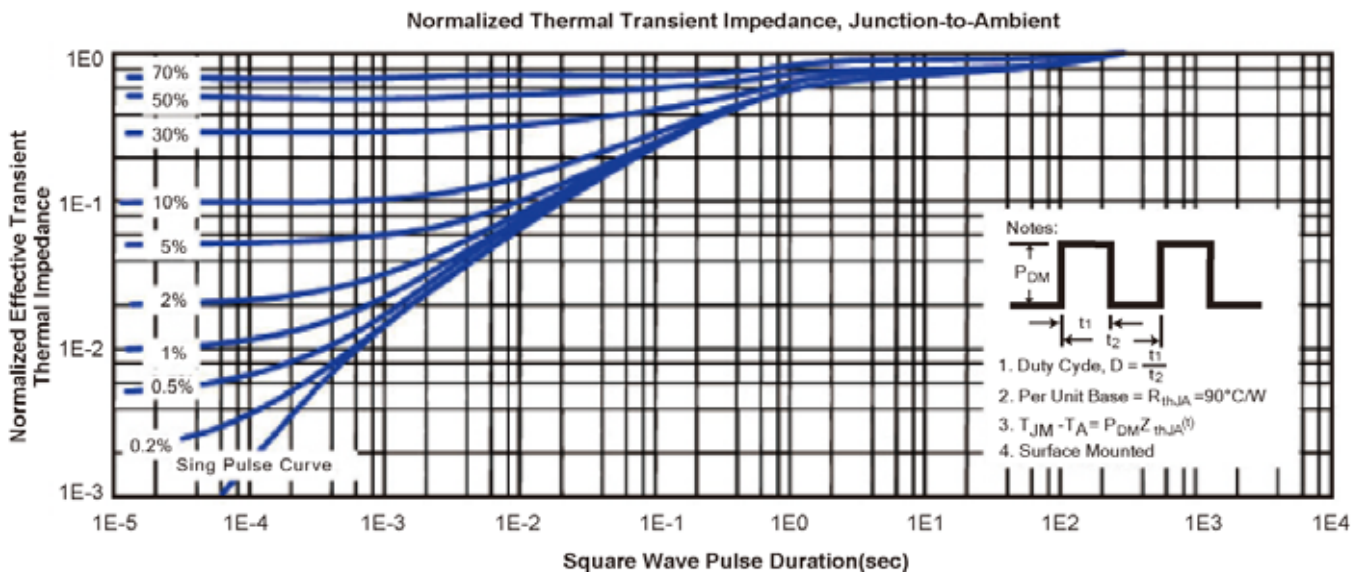
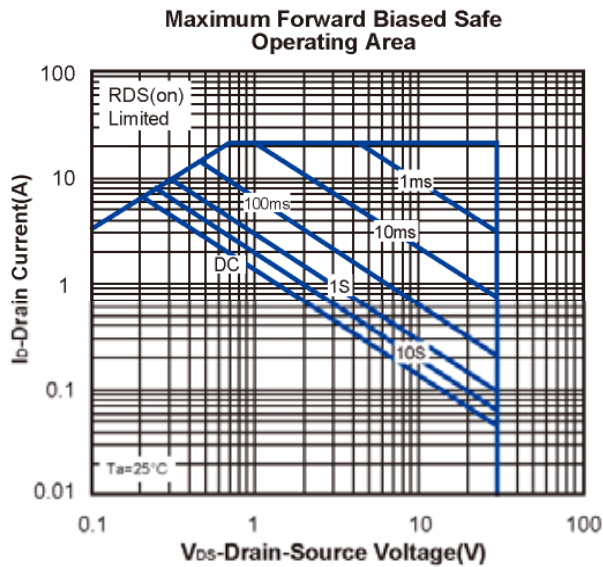
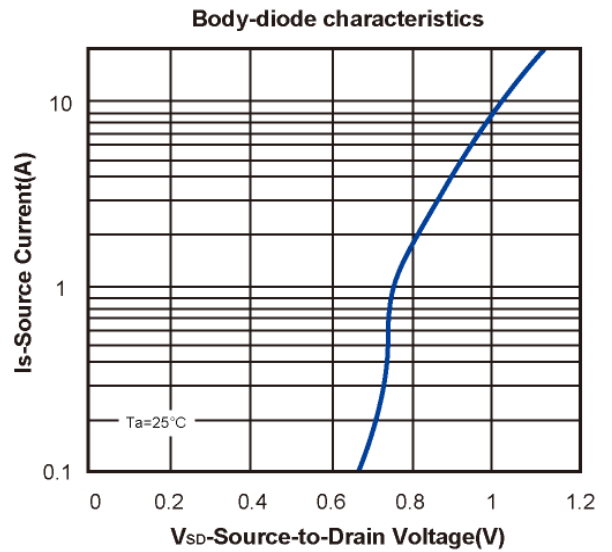
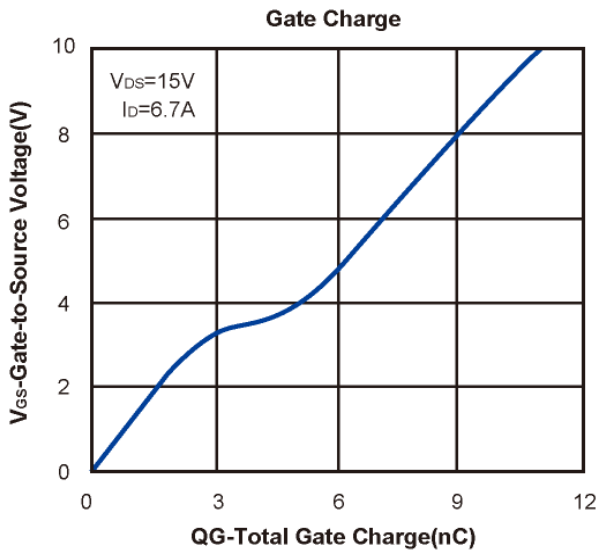
Notes: a. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

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

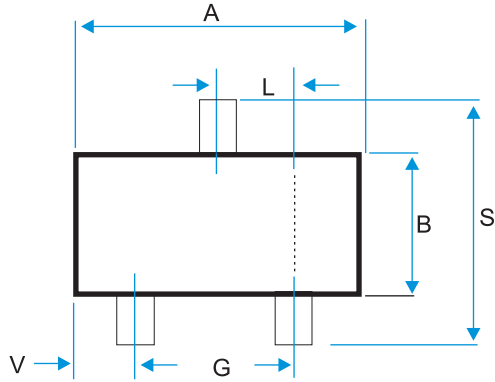
# RATING AND CHARACTERISTICS CURVES (RM2306E)



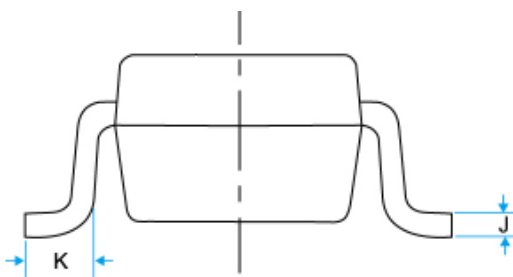
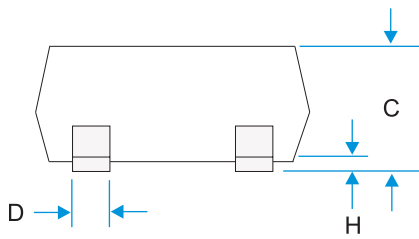
# RATING AND CHARACTERISTICS CURVES (RM2306E)



# SOT-23 Package Outline



DIM	MILLIMETERS (mm)	
	MIN	MAX
A	2.800	3.00
B	1.200	1.70
C	0.900	1.30
D	0.350	0.50
G	1.780	2.04
H	0.010	0.15
J	0.085	0.20
K	0.300	0.65
L	0.890	1.02
S	2.100	3.00
V	0.450	0.60



Package	Tube (pcs/tube)	Tube (pcs/inner box)	Tube (pcs/cartoon)	Tape&Reel (pcs/reel)	Tape&Reel (pcs/inner box)	Tape&Reel (pcs/cartoon)
DFN	100	10,000	100,000	2,500	5,000	40,000
SOP-8	100	10,000	100,000	4,000	4,000	20,000
TSSOP-8	100	32,000	128,000	3,000	6,000	48,000
SOT-23-3L	—	—	—	3,000	30,000	120,000
SOT-23-6L	—	—	—	3,000	30,000	120,000
SOT-23(6R)	—	—	—	3,000	30,000	120,000
SOT-363	—	—	—	3,000	30,000	120,000
SOT-523	—	—	—	3,000	30,000	120,000
SOT223	—	—	—	2,500	2,500	20,000
TO-220	50	1,000	5,000	—	—	—
TO-220F	50	1,000	10,000	—	—	—
TO-247	30	300	1,200	—	—	—
TO-251	80	4,000	40,000	—	—	—
TO-251S(4R)	80	4,000	40,000	—	—	—
TO-252-2L(4R)	80	4,000	40,000	2,500	2,500	25,000
TO-263-2L	50	1,000	10,000	800	800	8,000
TO-3P	30	300	3,000	—	—	—
TO-92	—	—	—	1,000(袋装)	10,000	100,000

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