

N - Channel 250-V (D-S) MOSFET

GENERAL DESCRIPTION

The ME2604 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.

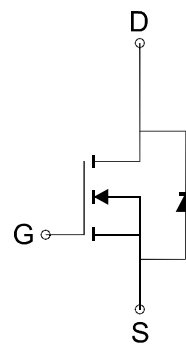
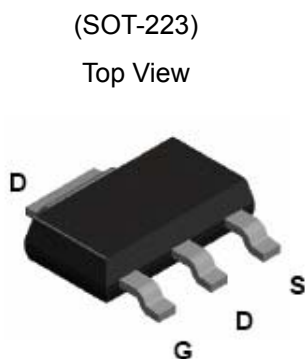
FEATURES

- $R_{DS(ON)} \leq 1.7\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 1.9\Omega @ V_{GS}=4.5V$
- 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
- DC/DC Converter
- Load Switch
- LCD Display inverter

PIN CONFIGURATION



N-Channel MOSFET

Ordering Information: ME2604(Pb-free)

ME2604-G (Green product-Halogen free)

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	250	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	$T_A=25^\circ C$	0.9
		$T_A=70^\circ C$	0.7
Pulsed Drain Current	I_{DM}	3.6	A
Maximum Power Dissipation	P_D	$T_A=25^\circ C$	2.2
		$T_A=70^\circ C$	1.4
Operating Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 to 150	$^\circ C$
Thermal Resistance-Junction to Ambient*	$R_{\theta JA}$	57	$^\circ C/W$

* The device mounted on 1in² FR4 board with 2 oz copper

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

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	250			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA	1.5		3.5	V
I _{GSS}	Gate-Body Leakage	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =250V, V _{GS} =0V			1	μA
R _{DS(ON)}	Drain-Source On-Resistance*	V _{GS} =10V, I _D =1A		1.4	1.7	Ω
		V _{GS} =4.5V, I _D =1A		1.45	1.9	
V _{SD}	Diode Forward Voltage *	I _{SD} =1A, V _{GS} =0V		0.8	1.2	V
DYNAMIC						
Q _g	Total Gate Charge	V _{DS} =200V, V _{GS} =10V, I _D =1.5A		30		nC
Q _g	Total Gate Charge	V _{DS} =200V, V _{GS} =4.5V, I _D =1.5A		17		
Q _{gs}	Gate-Source Charge			3		
Q _{gd}	Gate-Drain Charge			12		
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		1170		pF
C _{oss}	Output Capacitance			36		
C _{rss}	Reverse Transfer Capacitance			10		
t _{d(on)}	Turn-On Delay Time	V _{DD} =125V, R _L =125 Ω R _G =6 Ω, V _{GEN} =10V		19		ns
t _r	Turn-On Rise Time			4		
t _{d(off)}	Turn-Off Delay Time			48		
t _f	Turn-Off Fall Time			13		

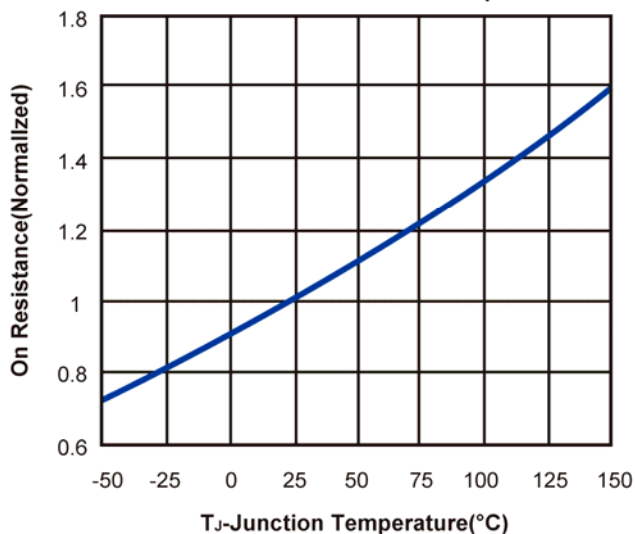
Notes: a. pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

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

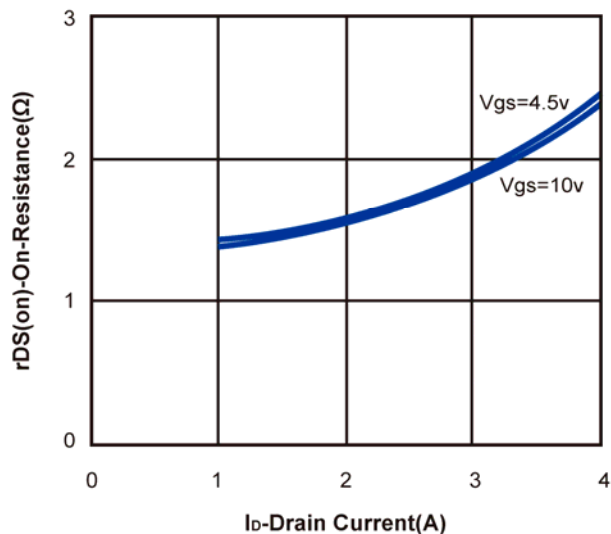
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Typical Characteristics (T_J =25°C Noted)

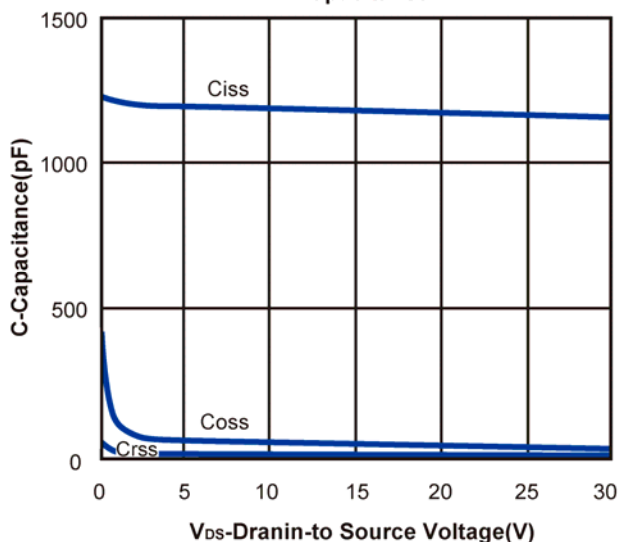
On Resistance vs. Junction Temperature



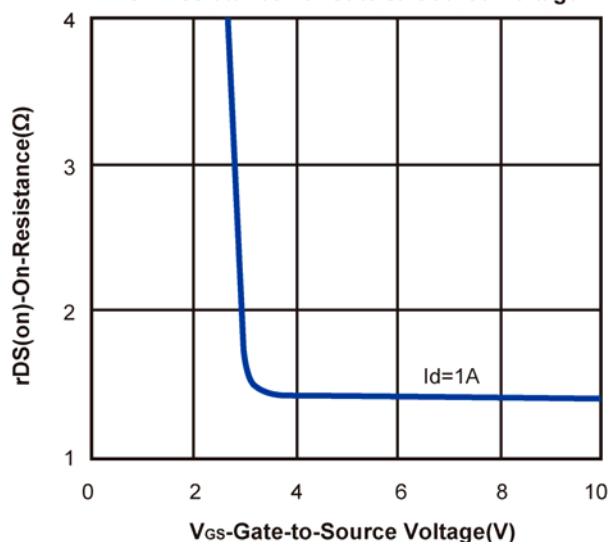
On Resistance vs. Drain Current



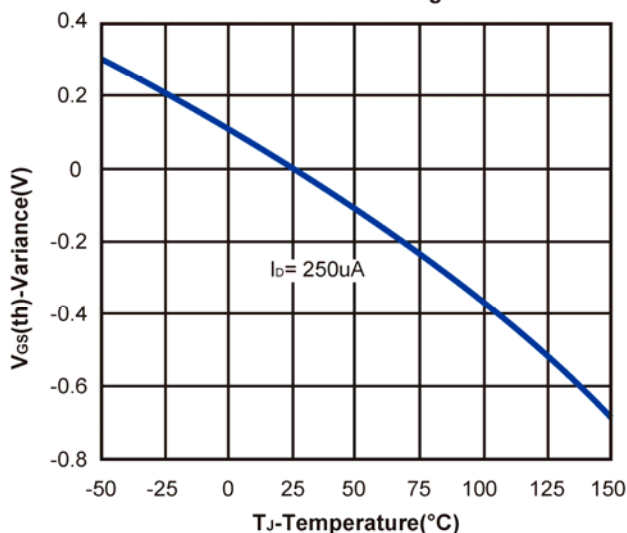
Capacitance



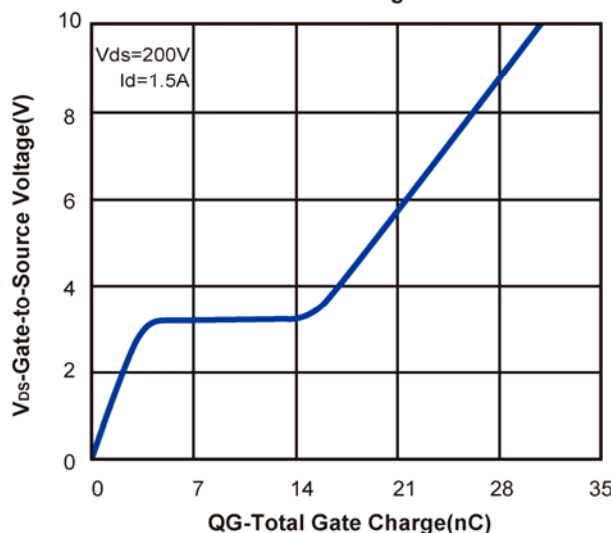
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage

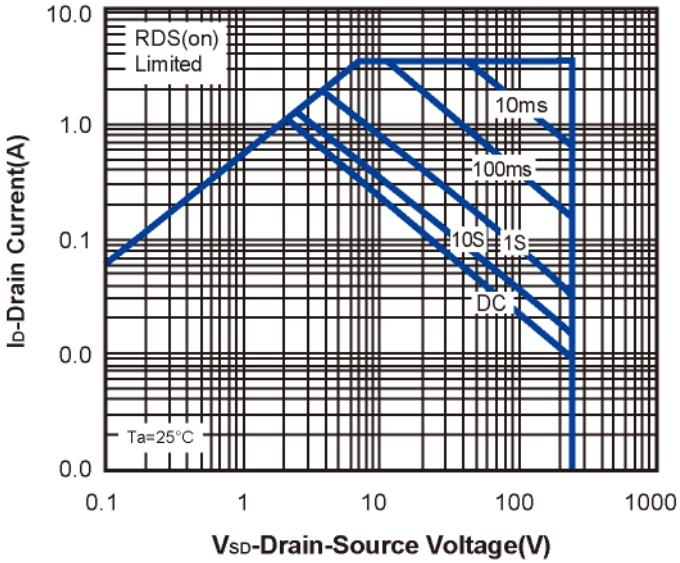


Gate Charge

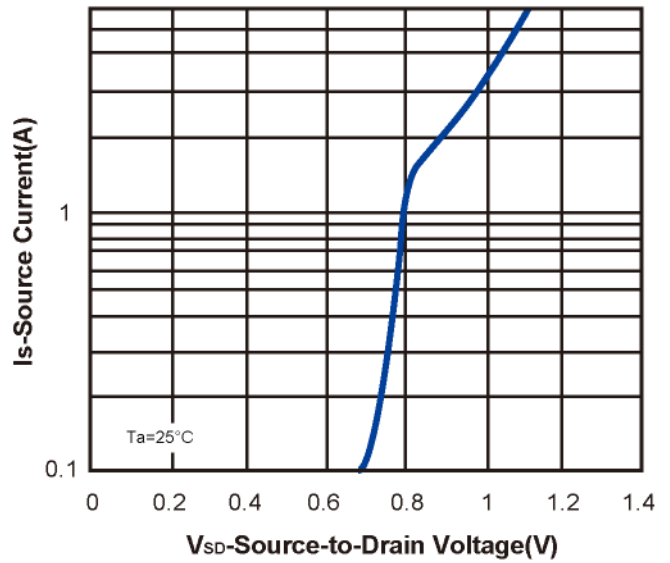


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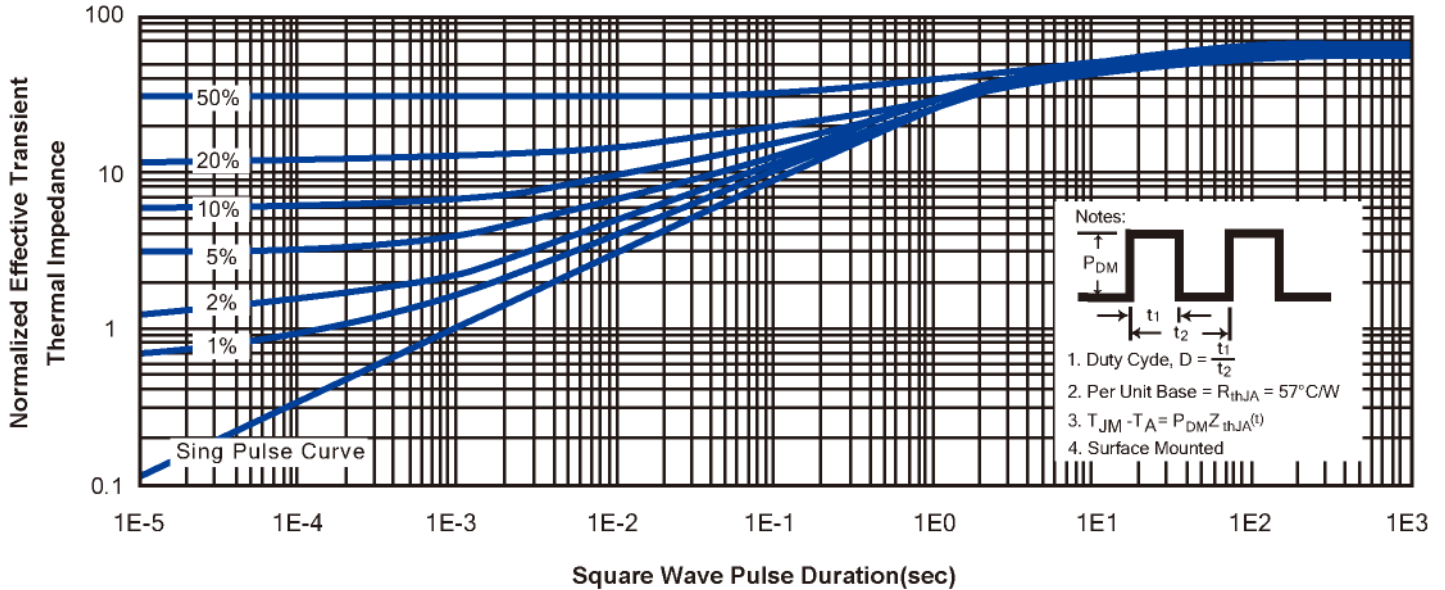
Maximum Forward Biased Safe Operating Area



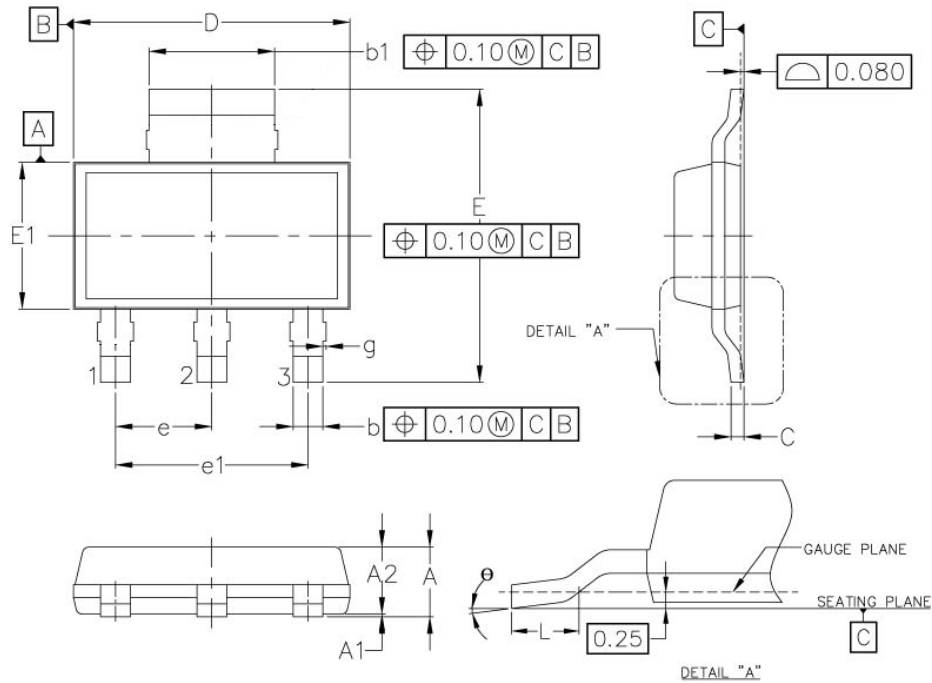
Body-diode characteristics



Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-223-3L Package Outline



SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	MOM.	MAX.	MIN.	MOM.	MAX.
A	—	—	1.80	—	—	0.0709
A1	0.02	—	0.10	0.0008	—	0.0039
A2	1.50	1.60	1.70	0.0591	0.0630	0.0669
b	0.66	0.76	0.84	0.0260	0.0300	0.0330
b1	2.90	3.00	3.10	0.1142	0.1181	0.1220
g	—	—	0.06	—	—	0.0020
C	0.23	0.30	0.35	0.0090	0.2560	0.1378
D	6.30	6.50	6.70	0.2480	0.2760	0.2638
E	6.70	7.00	7.30	0.2638	0.1378	0.2874
E1	3.30	3.50	3.70	0.1300	0.1378	0.1457
e	2.30 BSC			0.0906 BSC		
e1	4.60 BSC			0.1811 BSC		
L	0.81	—	—	0.0319	—	—
θ	0°	—	10°	0°	—	10°

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