N-Channel 30V (D-S) MOSFET

GENERAL DESCRIPTION

The ME7824S-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

- $R_{DS(ON)} \leqq 3m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 4.2m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Halogen free

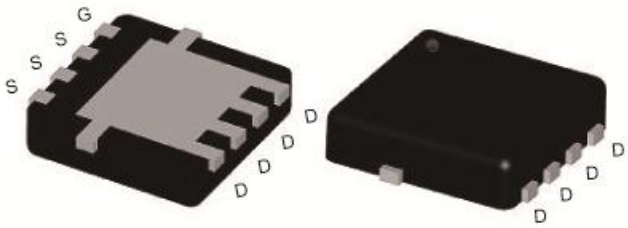
APPLICATIONS

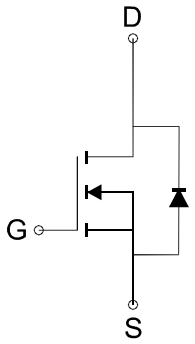
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch

PIN CONFIGURATION

DFN(S) 3X3

Top View





N-Channel MOSFET

Ordering Information: ME7824S-G (Green product-Halogen free)

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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current*	T_C=25℃	I_D	76	A
	T_C=70℃		60	
	T_A=25℃		24	
	T_A=70℃		19	
Pulsed Drain Current		I_{DM}	228	A
Maximum Power Dissipation*	T_C=25℃	P_D	27.8	W
	T_C=70℃		17.8	
	T_A=25℃		2.78	
	T_A=70℃		1.78	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	45	℃/W
Thermal Resistance-Junction to Case*		$R_{\theta JC}$	4.5	

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

*Chip silicon limitation current is 100A

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Electrical Characteristics (T_A=25℃ Unless Otherwise Specified)

Symbol	Parameter	Conditions	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		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
$R_{DS(ON)}$	Drain-Source On-State Resistance[a]	V_{GS}=10V, I_D=16A		2.3	3	mΩ
		*On Test Board	2.3		5	
		V_{GS}=4.5V, I_D=12A		3.2	4.2	
		*On Test Board	3.2		6.5	
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		66.9		nC
Qg	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_D=20A		33		
Qgs	Gate-Source Charge			13.1		
Qgd	Gate-Drain Charge			17.1		
Ciss	Input Capacitance	V_{DS}=15V, V_{GS}=0V, F=1MHz		3040		pF
Coss	Output Capacitance			361		
Crss	Reverse Transfer Capacitance			296		
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=15V, R_L=15Ω, V_{GS}=10V, R_G=3Ω		25.4		ns
t_r	Turn-On Rise Time			24		
$t_{d(off)}$	Turn-Off Delay Time			67.1		
t_f	Turn-Off Fall Time			23.3		

Single pulse Avalanche Energy			
Single pulse Avalanche Energy L=0.1mH	I_{AS}	38	A
Single pulse Avalanche Energy L=0.1mH	E_{AS}	72	mJ

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

b. Force mos reserves the right to improve or change product design, functions, reliability, qualified manufacturer without notice.

* If RDS(on) measurement is performed with the single device mounted on 1 in2 FR-4 board with 2oz, RDS(on) max. value refers to *On test board.

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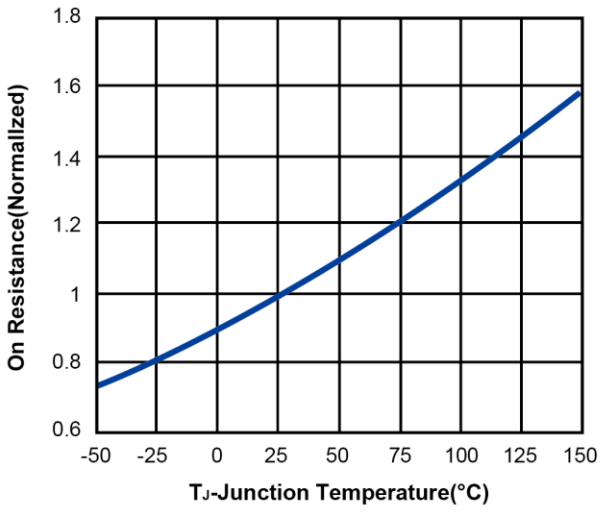
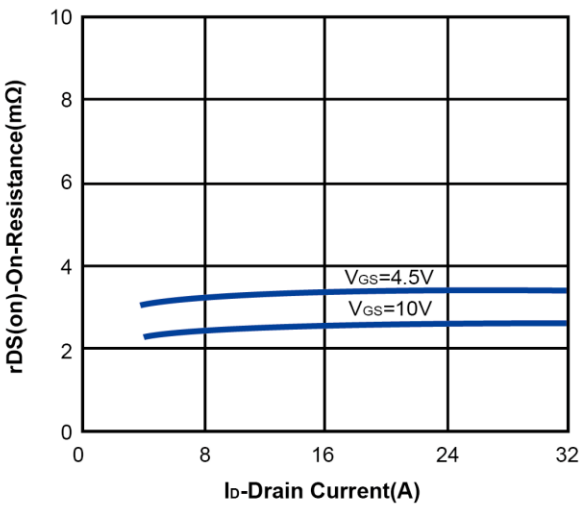
Typical Characteristics (T_J =25℃ Noted)

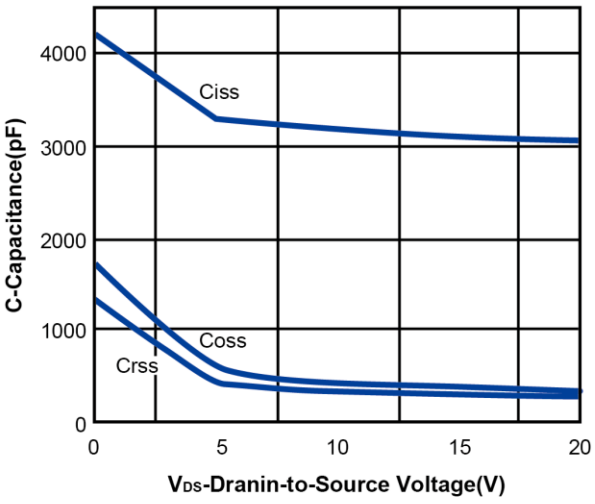
On Resistance vs. Junction Temperature



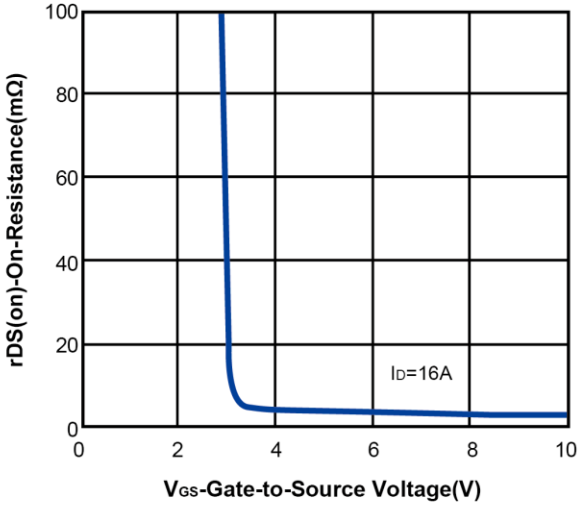
On Resistance vs. Drain Current



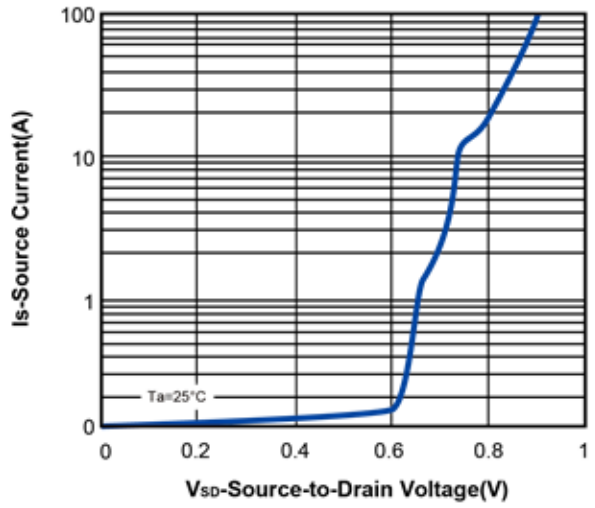
Capacitance



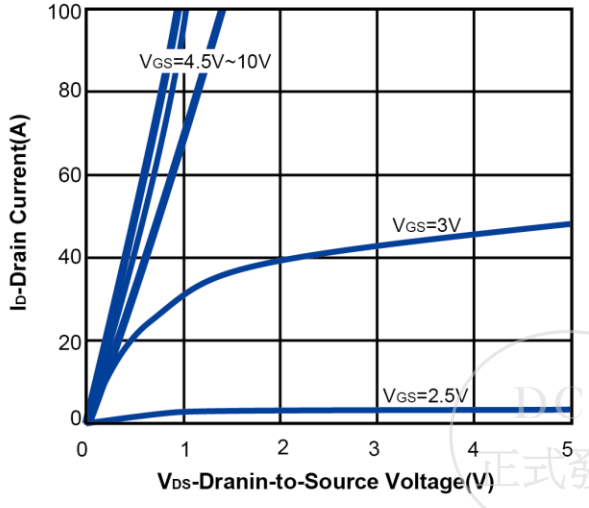
On Resistance vs. Gate-to-Source Voltage



Body-diode characteristics



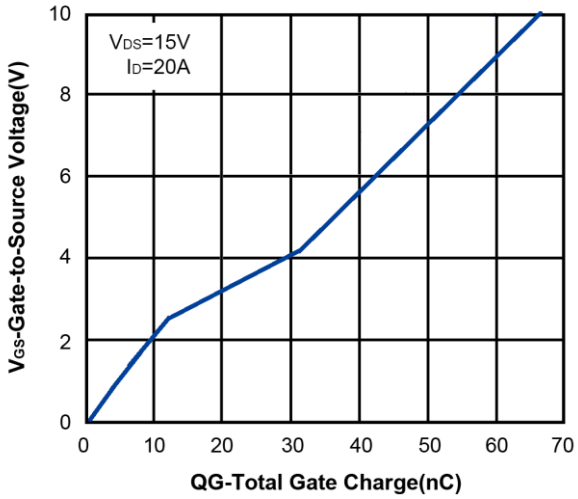
On-Region Characteristics



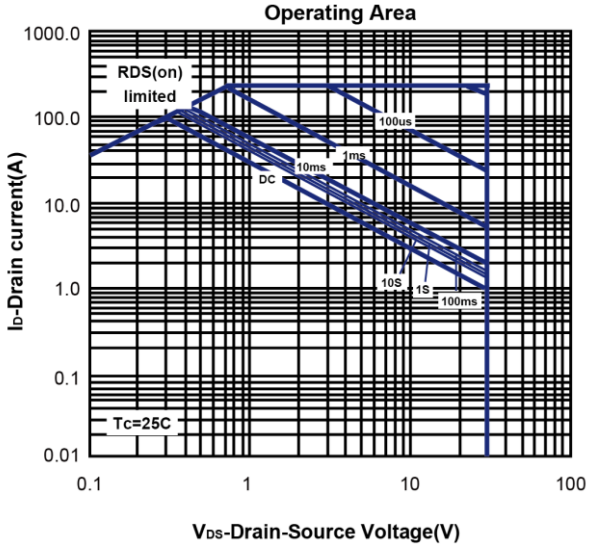
N-Channel 30V (D-S) MOSFET

Typical Characteristics (T_J =25℃ Noted)

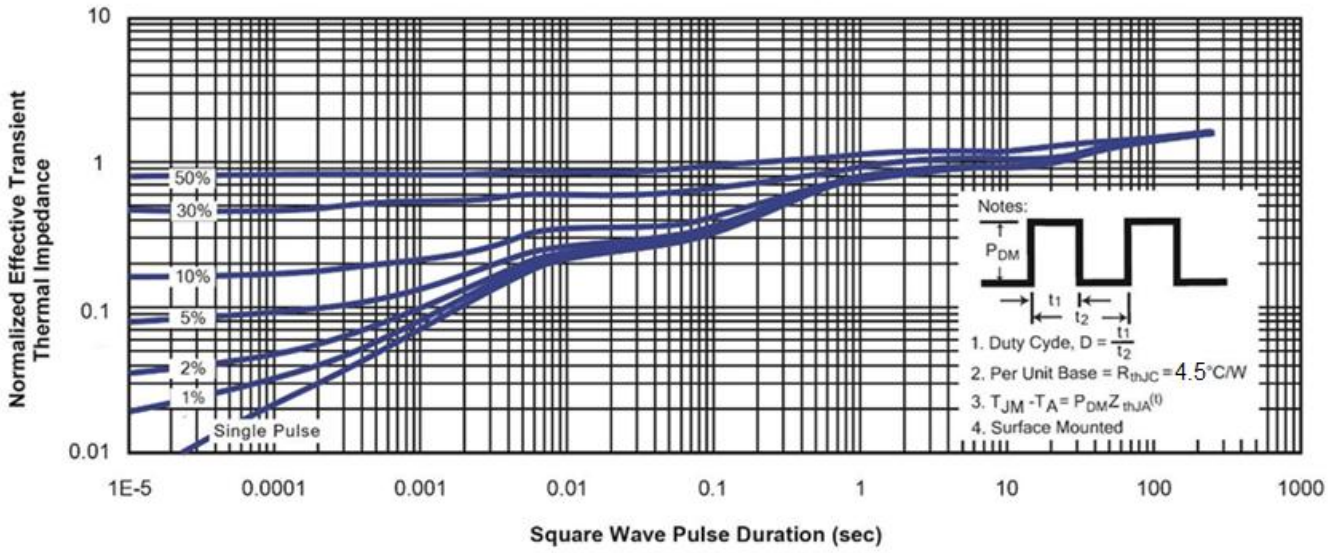
Gate Charge



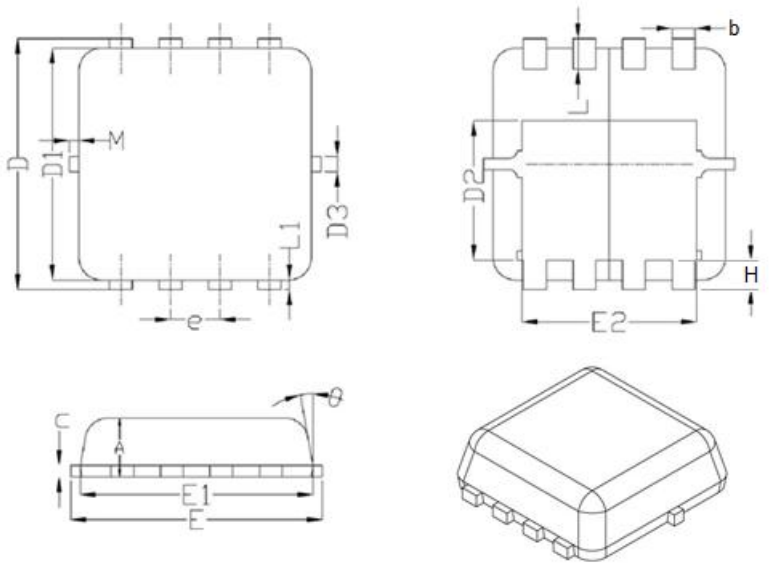
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

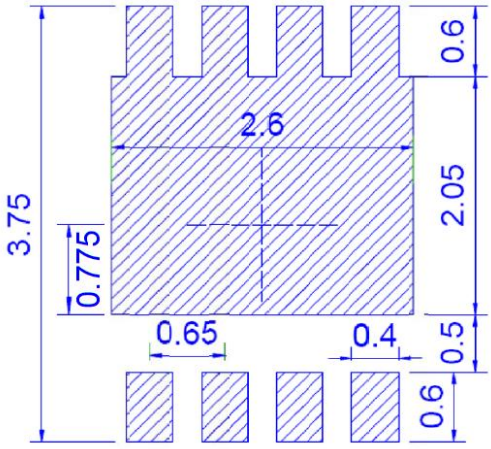


DFN(S) 3x3 Package Outline



SYMBOL	MILLIMETERS (mm)		
	MIN	Typ	MAX
A	0.7	0.775	0.85
b	0.2	0.3	0.4
c	0.1	0.175	0.25
D	3.15	3.3	3.45
D1	2.9	3.05	3.2
D2	1.54	1.74	1.94
D3	0.1	0.2	0.3
E	3.15	3.3	3.45
E1	3	3.125	3.25
E2	2.29	2.47	2.65
e	0.65BSC		
H	0.28	0.465	0.65
L	0.28	0.39	0.5
L1	0.06	0.13	0.2
θ	10°	12°	14°
M	0	0.075	0.13
∗Not specified			

FOOTPRINT



Device Name： ME7824S-G

Package： DFN 3*3 (punch type)