

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

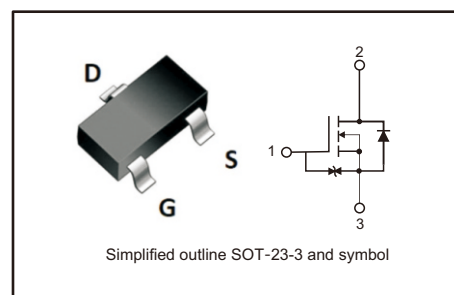
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features

- Low On-Resistance
- low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHs Compliant
- Halogen and Antimony Free. "Green" Device
- ESD Protected up to : 2000V

PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current Tamb=25°C	I_D	4	A
Pulsed Drain Current	I_{DM}^{*1}	±16	A
Power Dissipation	P_D^{*2}	1.0	W
	P_D^{*3}	0.76	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}^{*2}$	125	°C/W
	$R_{\theta JA}^{*3}$	165	
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C



ELECTRICAL CHARACTERISTICS (Ta=25 °C unless otherwise noted.)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 1mA$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = 12V, V_{DS} = 0V$			10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = 10V, I_D = 1mA$	0.5		1.5	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 4A$		34	48	m Ω
		$V_{GS} = 4V, I_D = 4A$		36	50	
		$V_{GS} = 2.5V, I_D = 4A$		47	66	
Forward Transconductance	g_{FS}	$V_{DS} = 10V, I_D = 4A$	4.0			S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS} = 10V$		475		pF
Output Capacitance	C_{OSS}	$V_{GS} = 0V$		120		
Reverse Transfer Capacitance	C_{RSS}	$f = 1MHz$		70		
Total Gate Charge	Q_g^{*4}	$V_{DD} = 15V$		5.9		nC
Gate-Source Charge	Q_{gs}^{*4}	$V_{GS} = 4.5V$		1.0		
Gate-Drain Charge	Q_{gd}^{*4}	$I_D = 4A$		2.0		
Gate Resistance	R_g	$V_{GS}=0, V_{DS}=0V, f=1MHz$		6.4		Ω
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}^{*4}$	$V_{DD}=15V,$ $R_{GEN}=10\Omega,$ $V_{GS}=4.5V,$ $I_D=2.0A,$		10		ns
Turn-On Rise Time	t_{rr}^{*4}			18		
Turn-Off Delay Time	$t_{d(off)}^{*4}$			37		
Turn-Off Fall Time	t_f^{*4}			19		
Body Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}^{*4}	$I_S = 0.8A, V_{GS} = 0V$			1.2	V
Diode Forward Current	I_S	Ta=25 °C			0.8	A

*1 $P_w \leq 10\mu s, Duty \leq 1\%$

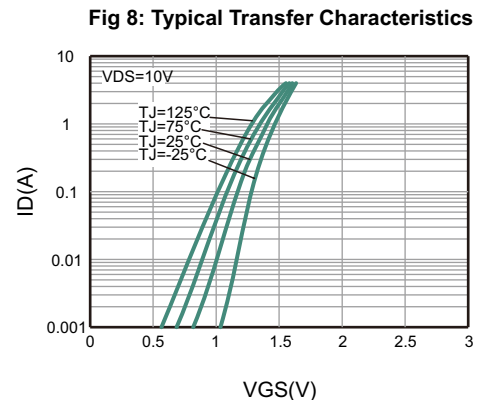
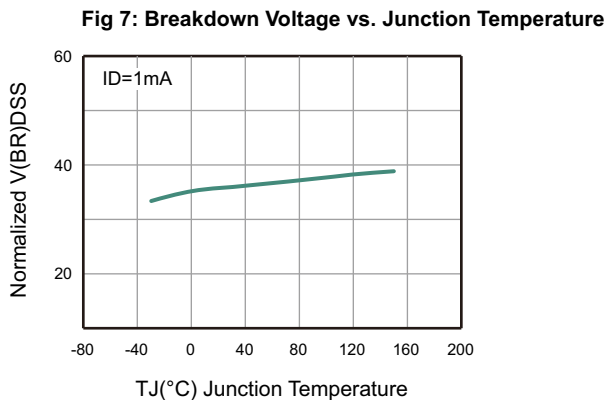
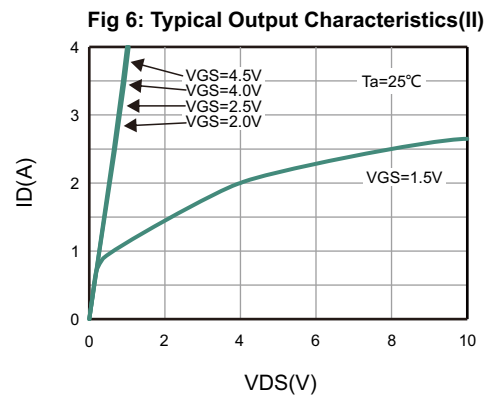
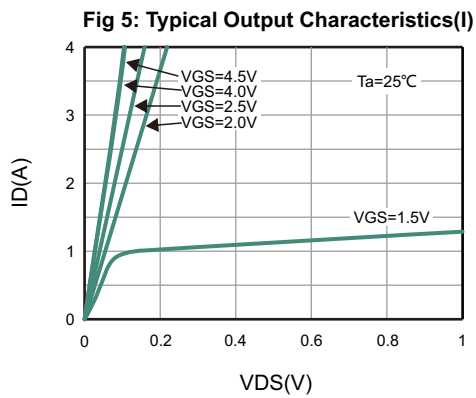
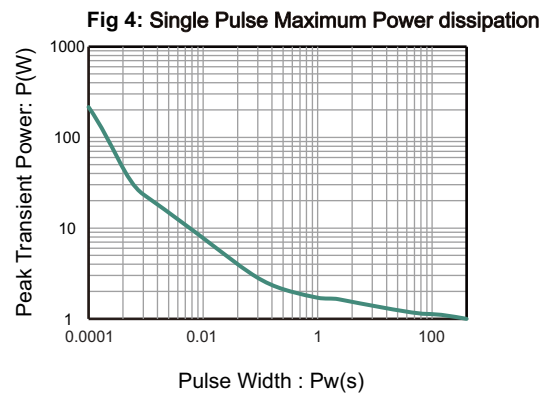
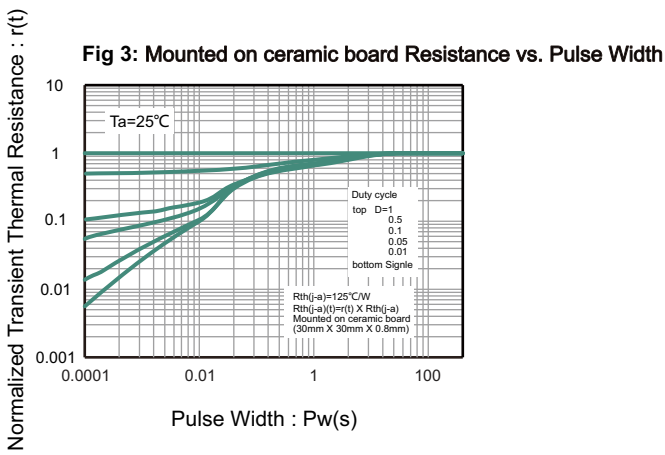
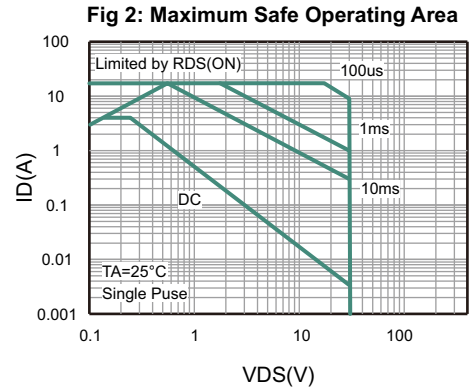
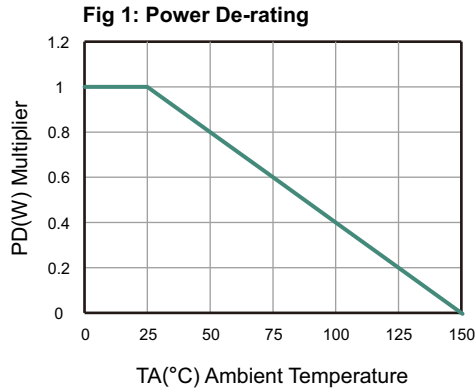
*2 Mounted on a ceramic board (30×30×0.8mm)

*3 Mounted on a FR4 (25×25×0.8mm)

*4 Pulsed



Typical Performance Characteristics





Typical Performance Characteristics

Fig 9: Gate Threshold Voltage vs Junction Temperature

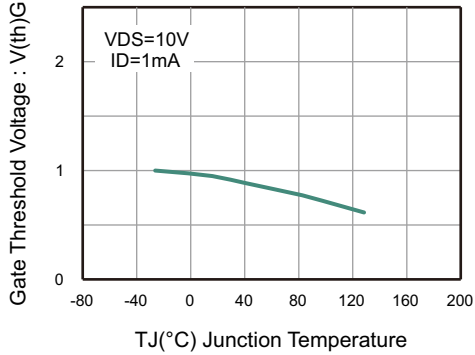


Fig 10: Forward Transfer Admittance vs. Drain Current

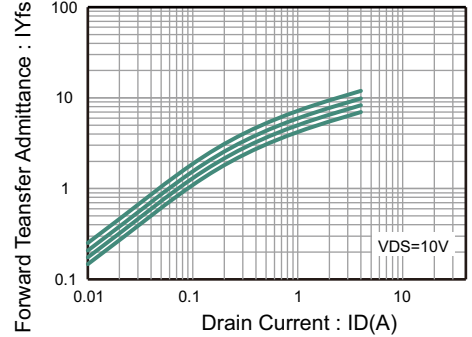


Fig 11: Drain Current Derating Curve

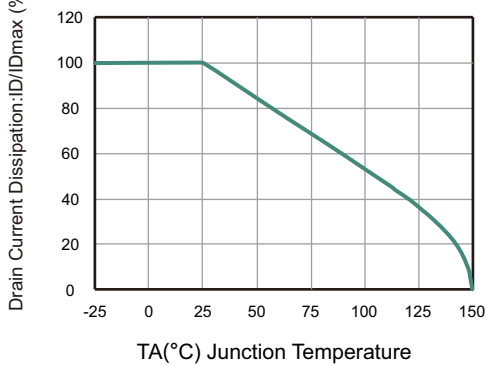


Fig 12: RDS(ON) vs. VGS

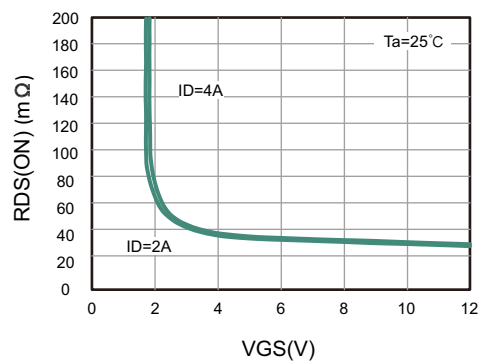


Fig 13: Normalized on Resistance vs. Junction Temperature

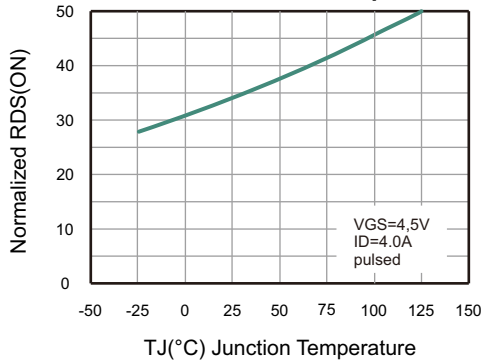


Fig 14: On-Resistance vs. Drain Current(I)

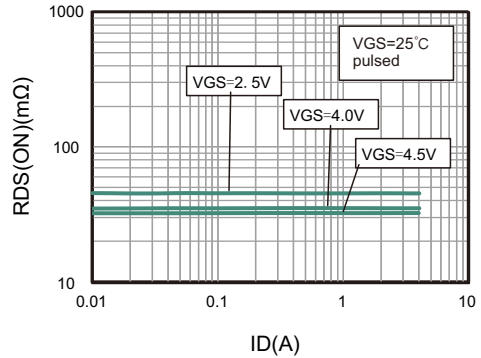


Fig 15: On-Resistance vs. Drain Current(II)

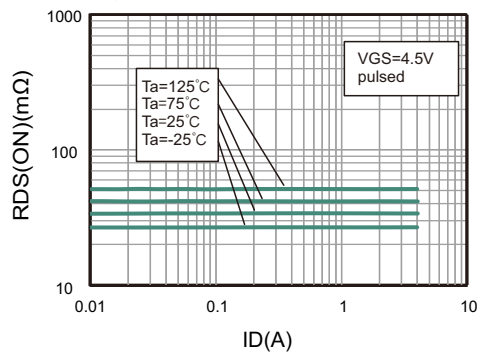
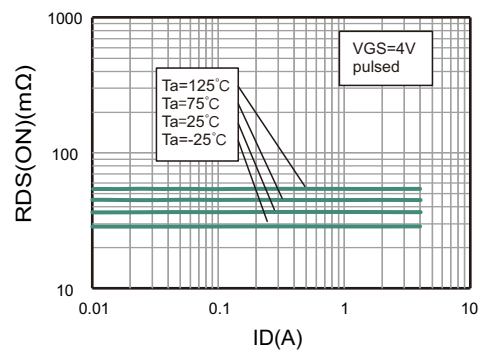


Fig 16: On-Resistance vs Drain Current(III)





Typical Performance Characteristics

Fig 17: On-Resistance vs Drain Current(IV)

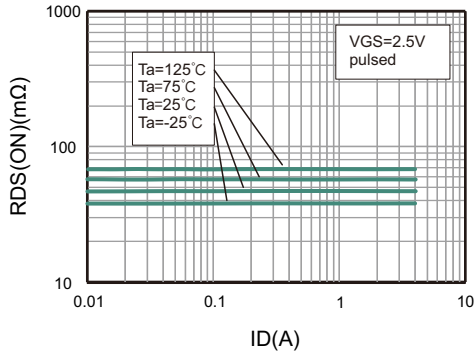


Fig 18: Capacitance Characteristics

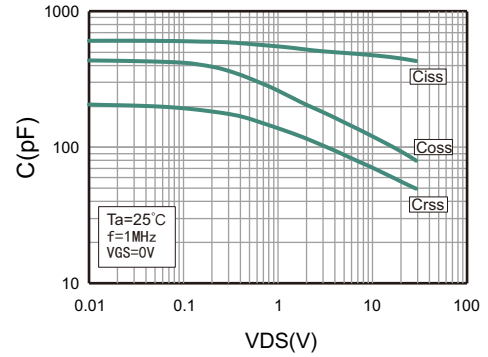


Fig.19 Switching Characteristics

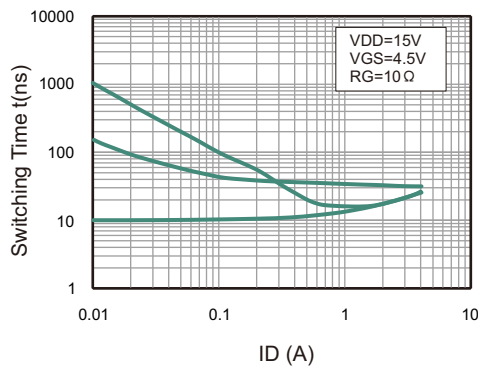


Fig 20: Gate Charge Characteristics

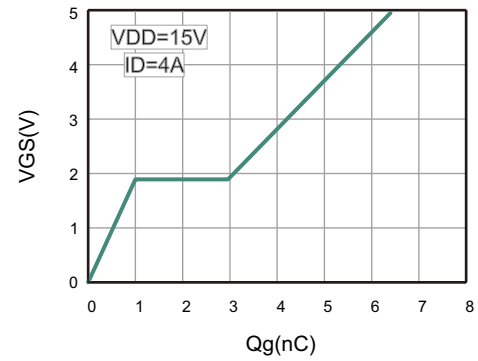
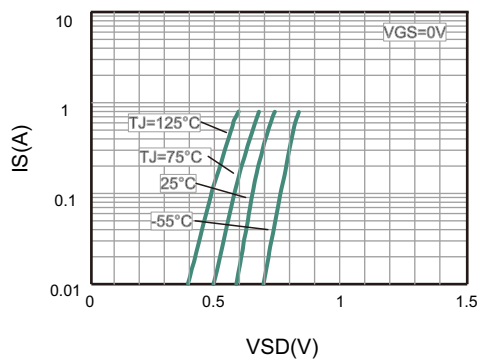
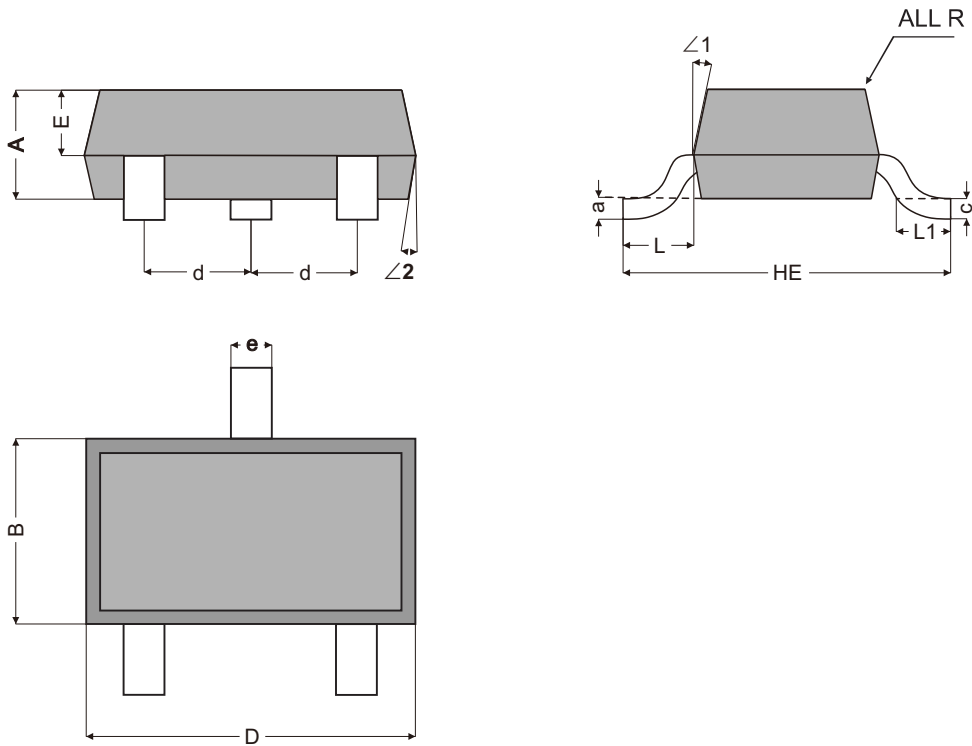


Fig 21: Body Diode Characteristics



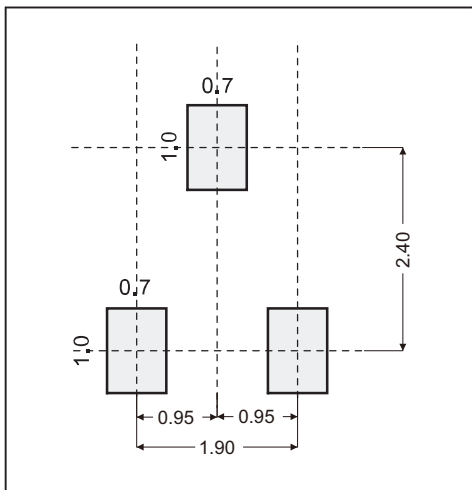


SOT23-3 Package Outline Dimensions



Unit		A	B	C	HE	D	d	E	e	L	L1	a	R	∠ 1	∠ 2
mm	max	1.05	1.80	0.20	2.90	3.12	1.00	0.65	0.40	0.70	0.60	0.2 (ref)	R0.1 (ref)	12°	10°
	typ	0.95	1.60	0.15	2.80	2.92	0.95	0.55	0.35	0.60	/				
	min	0.85	1.40	0.10	2.70	2.72	0.90	0.45	0.30	0.50	0.20				
mil	max	41	71	8	114	123	39	26	16	28	24	8 (ref)	R4 (ref)	12°	10°
	typ	37	63	6	110	115	37	22	14	24	/				
	min	33	55	4	106	107	35	18	12	20	8				

The recommended mounting pad size



Marking

Type number	Marking code
NM4N30ECWR	OCH



Important Notice and Disclaimer

Jingdao Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.

Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

Jingdao Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does Jingdao Microelectronics assume any liability for application assistance or customer product design.

Jingdao Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of Jingdao Microelectronics.

Jingdao Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of Jingdao Microelectronics.