

preliminary

CMA023N04NL-TL

40V N-Channel Power MOSFET

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$

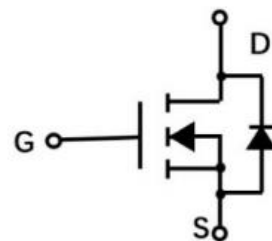
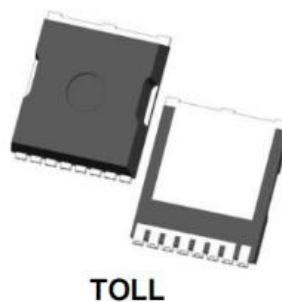
Applications

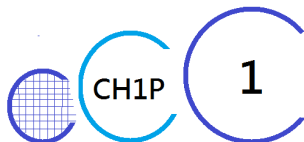
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Product Summary

Item	Typical Value	Unit
V_{DS}	40	V
$R_{DS(on)}$ @ $V_{GS} = 10V$ (Max)	2.3	$m\Omega$
I_D	190	A

Pin Description





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Absolute Ratings ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse UIS Capability, 0.5mH	E_{AS}	200	mJ
Continuous Drain Current, $T_C = 25^{\circ}\text{C}$	I_D	190	A
Maximum Power Dissipation, $T_C = 25^{\circ}\text{C}$	P_D	166	W
Junction Temperature Maximum	T_{JMAX}	150	$^{\circ}\text{C}$
Storage Temperature	$T_{Storage}$	-55 to 150	$^{\circ}\text{C}$

Absolute Ratings

Parameter	Symbol	Value	Units
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	20	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Static (T _J =25℃ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	40	---	---	V
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	---	---	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V,T _J =25℃	---	---	1	uA
		V _{DS} = 40V, V _{GS} = 0V,T _J =100℃	---	---	100	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	---	---	2.5	mΩ
		V _{GS} = 4.5V, I _D = 20A	---	---	3.5	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	1.0	---	2.5	V
Dynamic (T _J =25℃ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	---	3555	---	pF
Output Capacitance	C _{oss}		---	2593	---	
Reverse Transfer Capacitance	C _{rss}		---	440	---	
Total Gate Charge	Q _g	V _{DS} = 32V, I _D = 10A, V _{GS} = 10V	---	66	---	nC
Gate-Source Charge	Q _{gs}		---	13.6	---	
Gate-Drain Charge	Q _{gd}		---	12.6	---	
Turn-on delay time	T _{d(on)}	V _{DS} = 20V, R _D = 0.5Ω, R _G = 10Ω,	---	89.3	---	ns
Rise time	T _r		---	21.4	---	
Turn-off delay time	T _{d(off)}		---	72.3	---	
Fall time	T _f		---	34.5	---	
Reverse Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _F = 20A	---	---	0.8	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _F = 20A, dI _F /dt=100A/us	---	31	---	ns
Reverse Recovery Charge	Q _{rr}		---	110	---	nC

Typical Characteristics

Figure 1: Output Characteristics

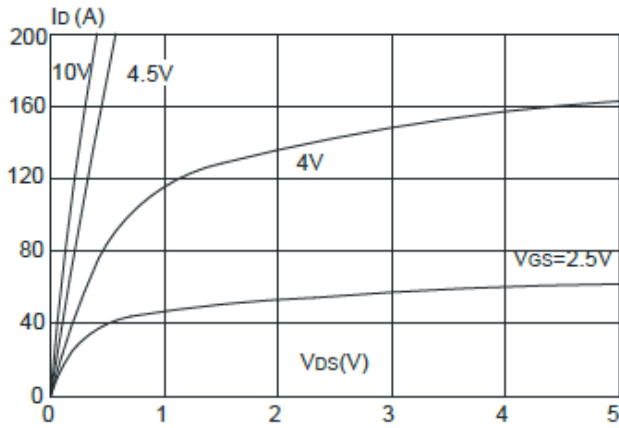


Figure 2: Typical Transfer Characteristics

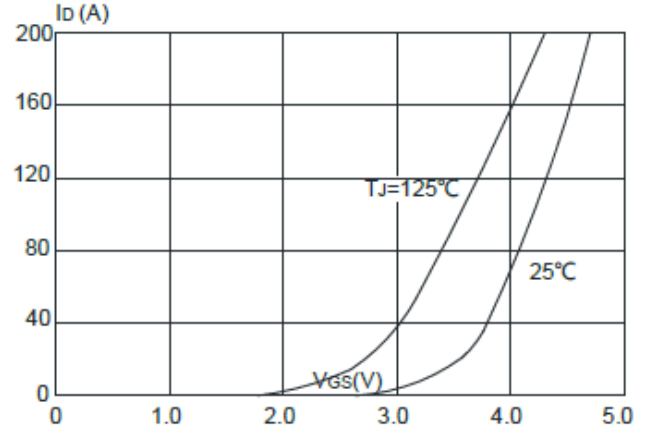


Figure 3: On-resistance vs. Drain Current

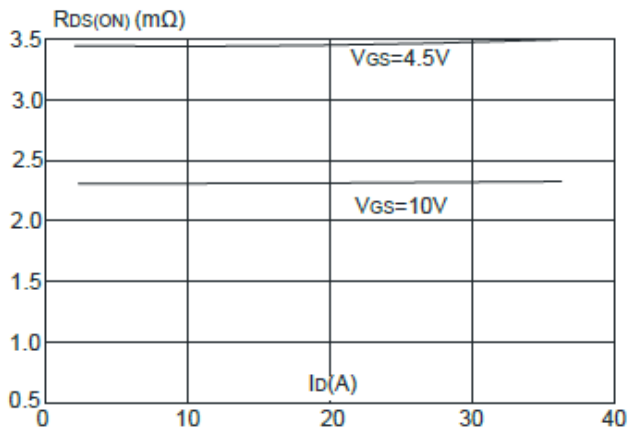


Figure 4: Body Diode Characteristics

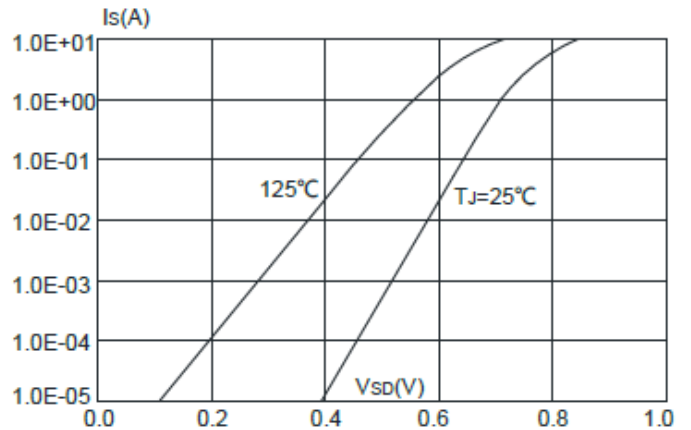


Figure 5: Gate Charge Characteristics

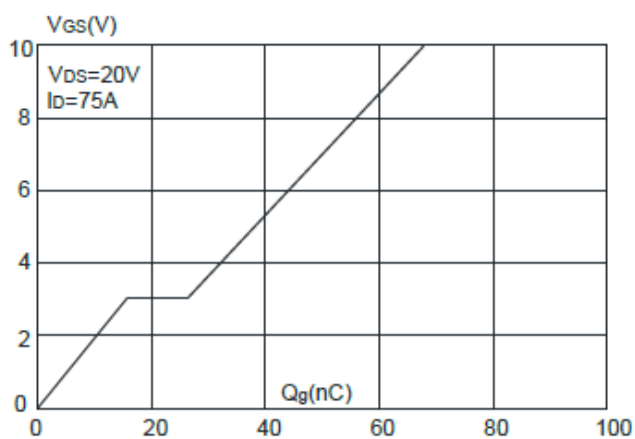


Figure 6: Capacitance Characteristics

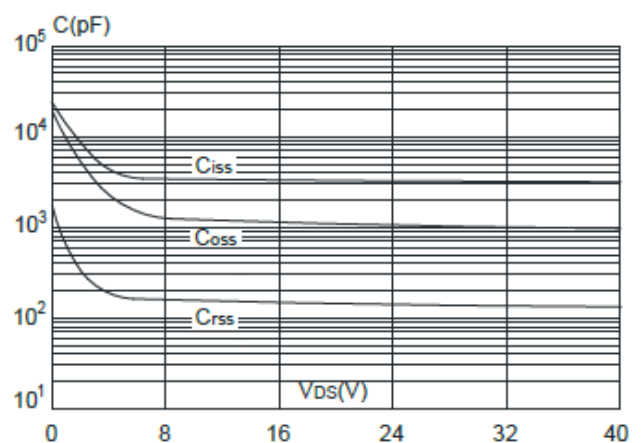


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

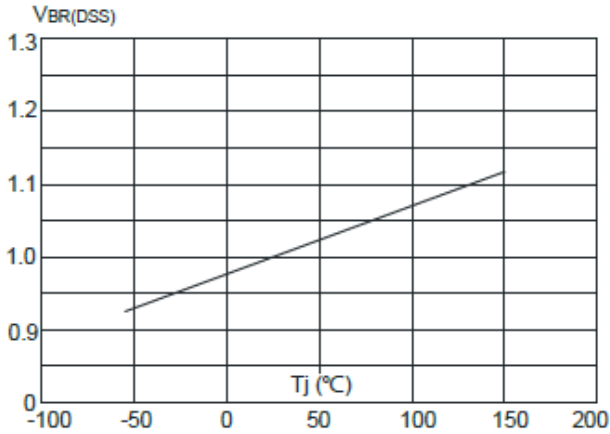


Figure 8: Normalized on Resistance vs. Junction Temperature

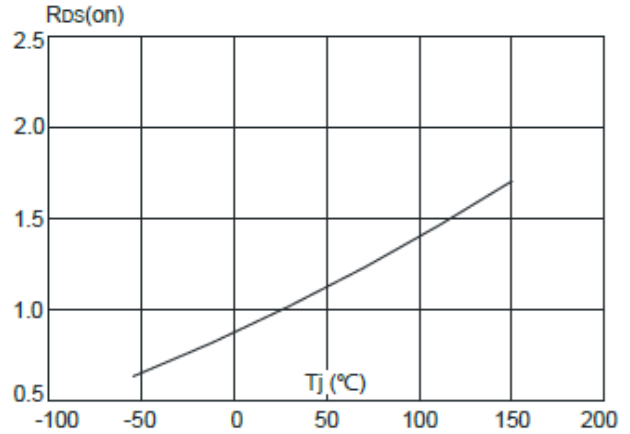


Figure 9: Maximum Safe Operating Area

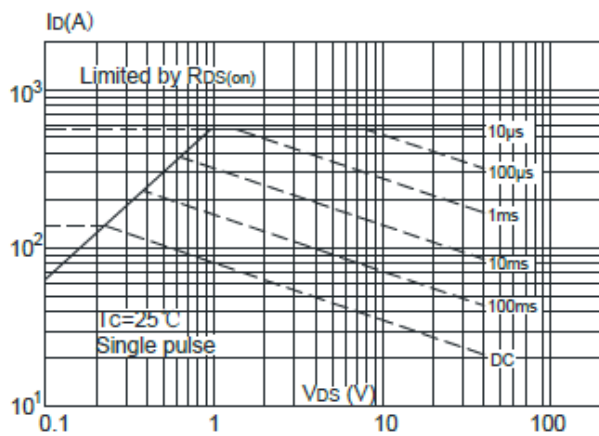


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

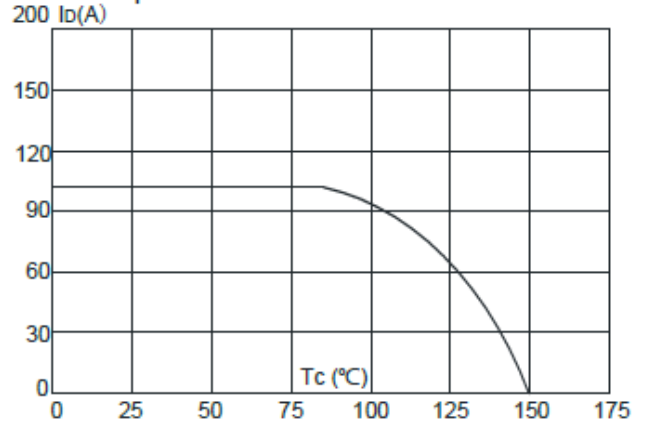
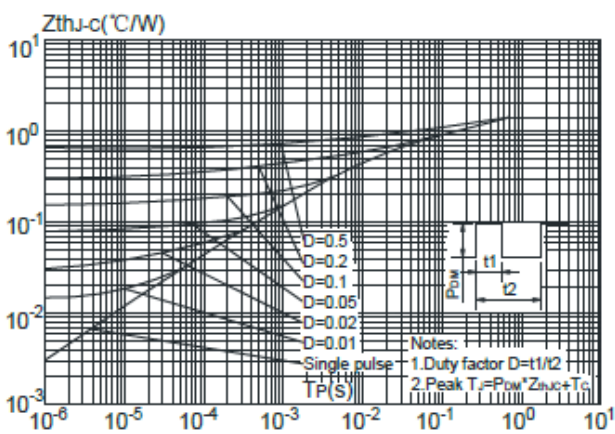


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



TOLL

