

preliminary

CMA010N04NH-TL

40V N-Channel Power MOSFET

Features

- High Speed Power Switching
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free

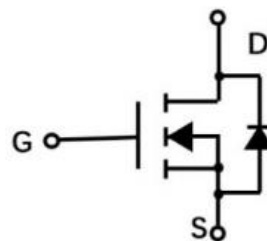
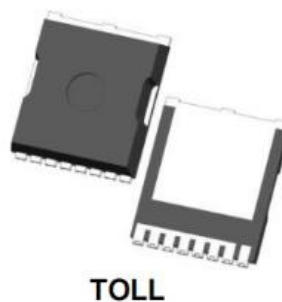
Applications

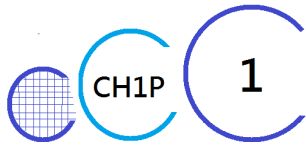
- Synchronous Rectification in SMPS
- High Frequency Switching

Product Summary

Item	Typical Value	Unit
V_{DS}	40	V
$R_{DS(on)} @ V_{GS} = 10V (Max)$	1.0	m Ω
I_D	300	A

Pin Description





preliminary

CMA010N04NH-TL

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, 1.0mH	E_{AS}	287	mJ
Continuous Drain Current, $T_C = 25^\circ\text{C}/100^\circ\text{C}$	I_D	300/130	A
Maximum Power Dissipation, $T_C = 25^\circ\text{C}$	P_D	192	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	$R_{\theta JA}$	18	$^\circ\text{C}/\text{W}$

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 = 75A	---	---	1.0	mΩ
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	2.0	---	4.0	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} = 10 V, f = 300kHz	---	6450	---	pF
Output Capacitance	C _{oss}		---	3610	---	
Reverse Transfer Capacitance	C _{rss}		---	330	---	
Total Gate Charge	Q _g	V _{DS} = 32V, I _D = 150A, V _{GS} = 10V	---	120	---	nC
Gate-Source Charge	Q _{gs}		---	39	---	
Gate-Drain Charge	Q _{gd}		---	26	---	
Turn-on delay time	T _{d(on)}	V _{DS} = 17.5V, R _L = 0.235Ω, V _{GS} = 10V, R _G = 5Ω,	---	19	---	ns
Rise time	T _r		---	26	---	
Turn-off delay time	T _{d(off)}		---	85	---	
Fall time	T _f		---	45	---	
Reverse Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 20A	---	---	1.2	V
Reverse Recovery Time	t _{rr}	V _D = 35V, I _F = 10A, dI _F /dt=100A/us	---	141	---	ns
Reverse Recovery Charge	Q _{rr}		---	333	---	nC

Typical Characteristics

Figure.1 Typical Output Characteristics

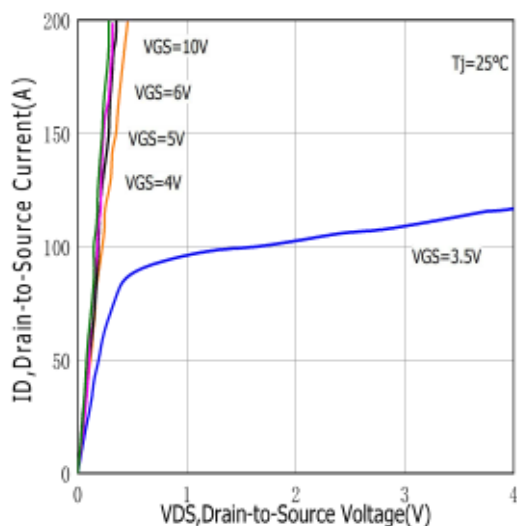


Figure.2 Typical Gate Charge vs Gate to Source Voltage

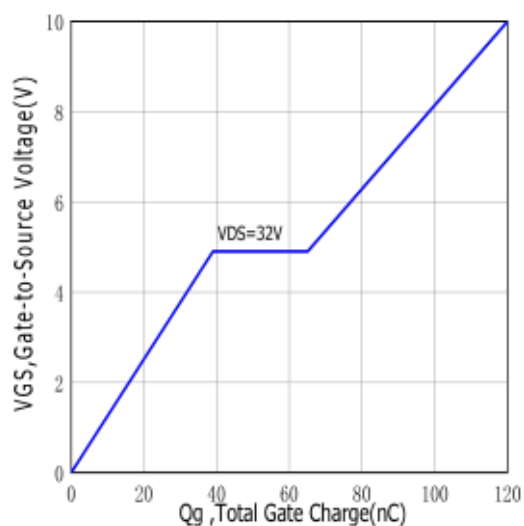


Figure.3 Typical Body Diode Transfer Characteristics

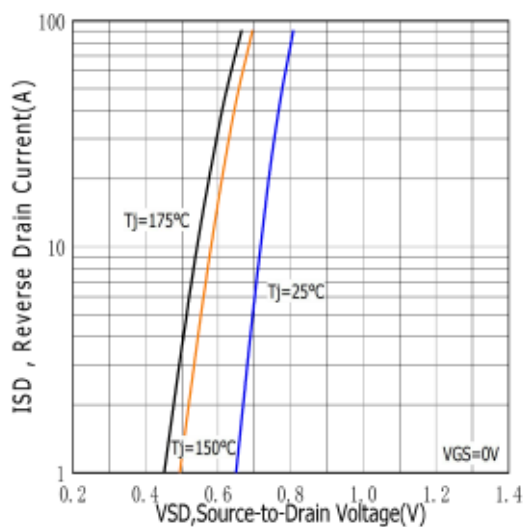


Figure.4 Typical Capacitance vs Drain to Source Voltage

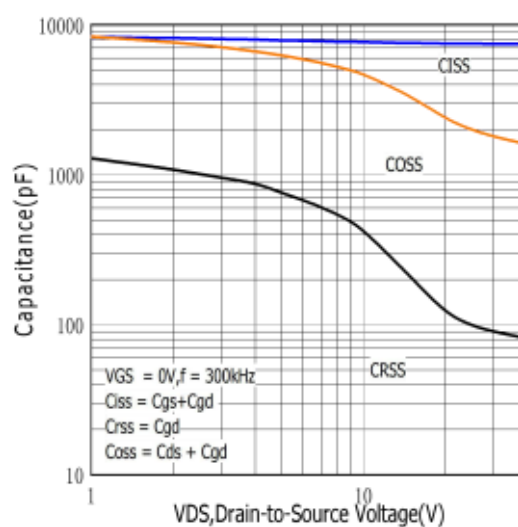


Figure.5 Typical Breakdown Voltage vs Junction Temperature

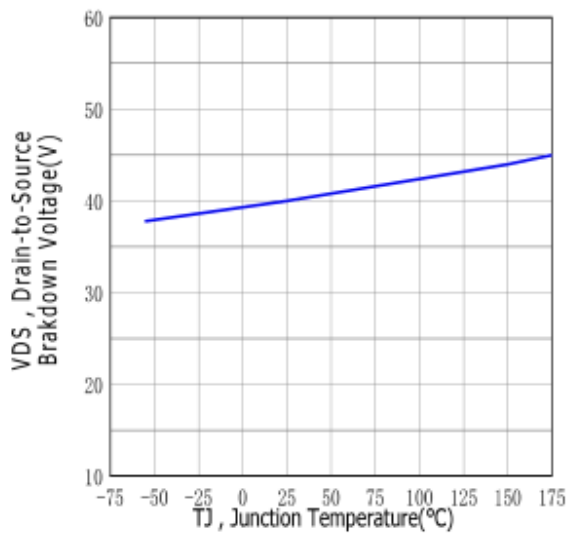


Figure.6 Typical Drain to Source on Resistance vs Junction Temperature

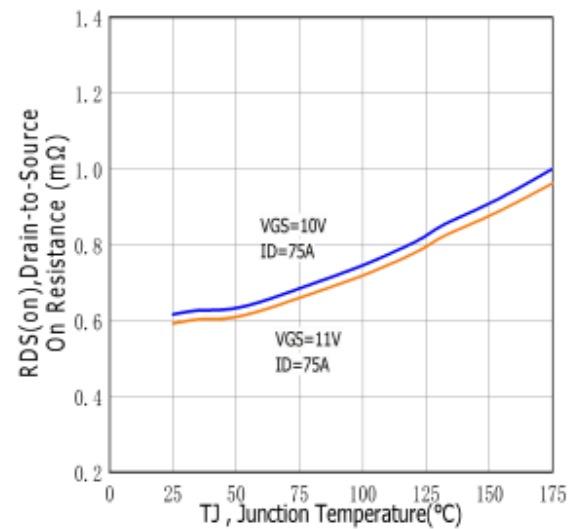


Figure.7 Maximum Forward Bias Safe Operating Area

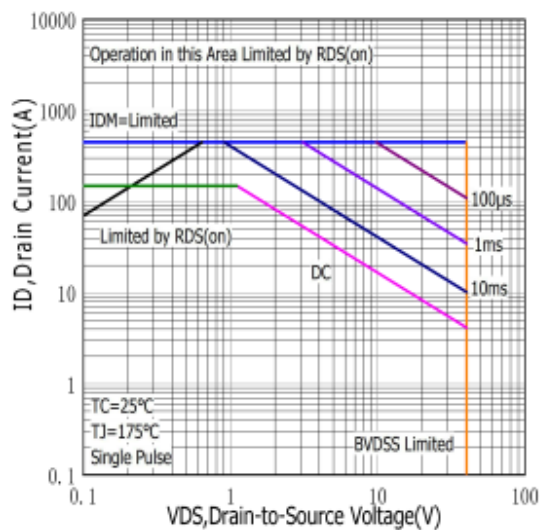


Figure.8 Typical Drain to Source ON Resistance vs Drain Current

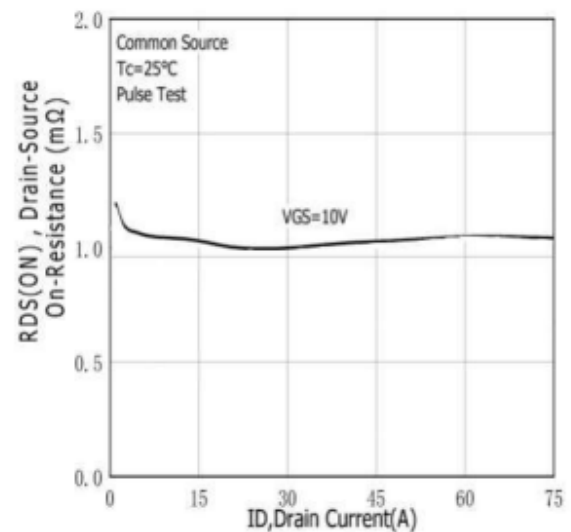


Figure.9 Maximum EAS vs Channel Temperature

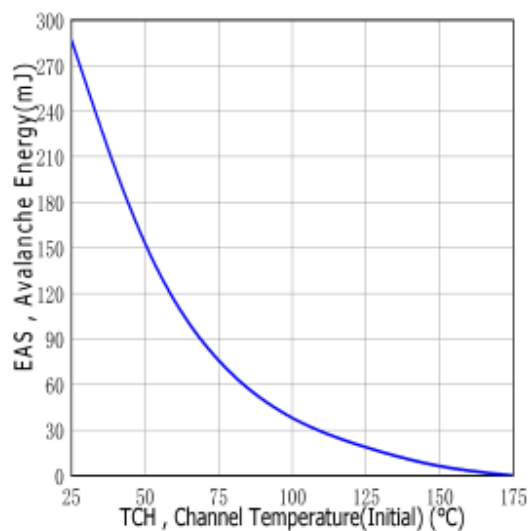


Figure.10 Typical Threshold Voltage vs Case Temperature

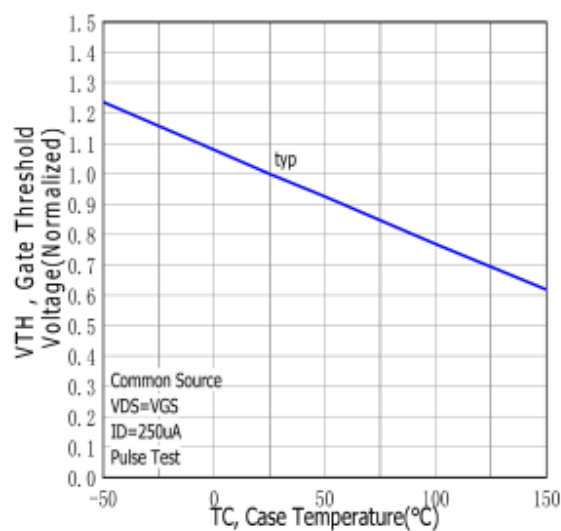


Figure.11 Typical Transfer Characteristics

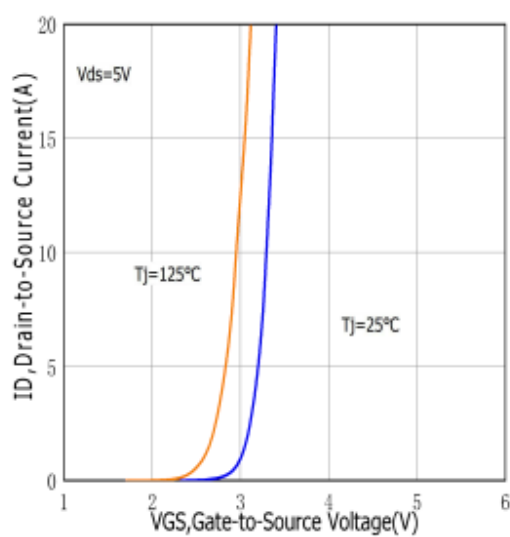


Figure.12 Maximum Power Dissipation vs Case Temperature

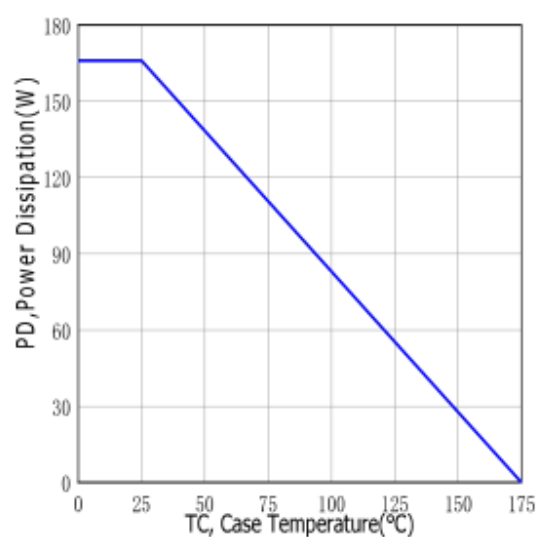


Figure.13 Maximum Drain Current vs. Case Temperature

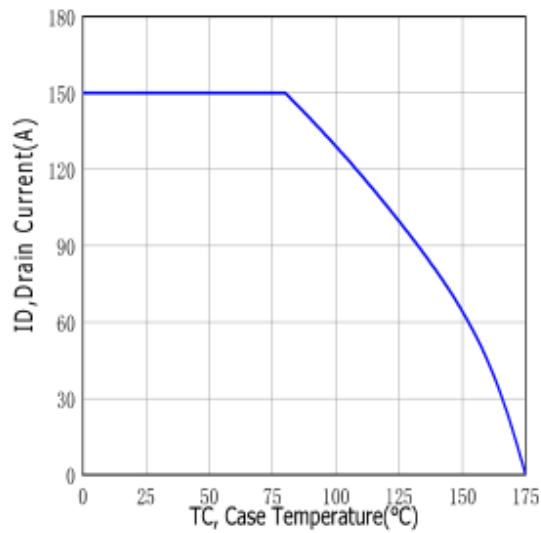


Figure.14 Maximum Effective Thermal Impedance, Junction to Case

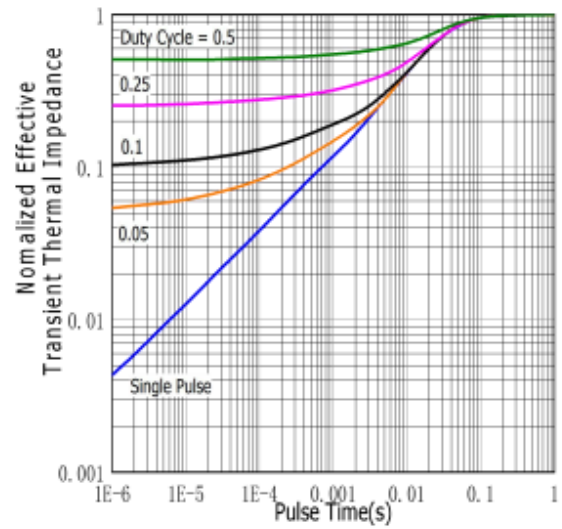


Figure.15 Typical Body Diode Transfer Characteristics

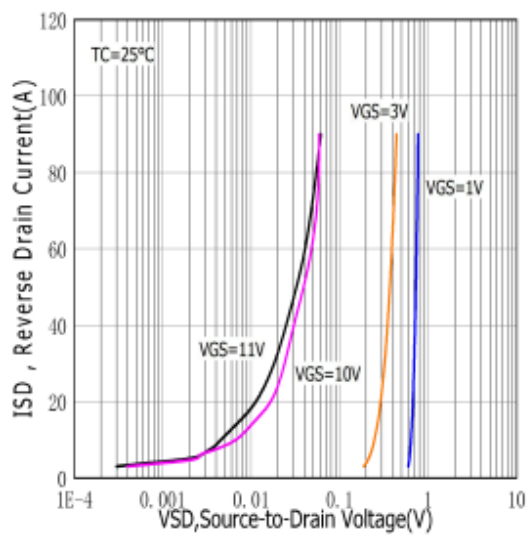
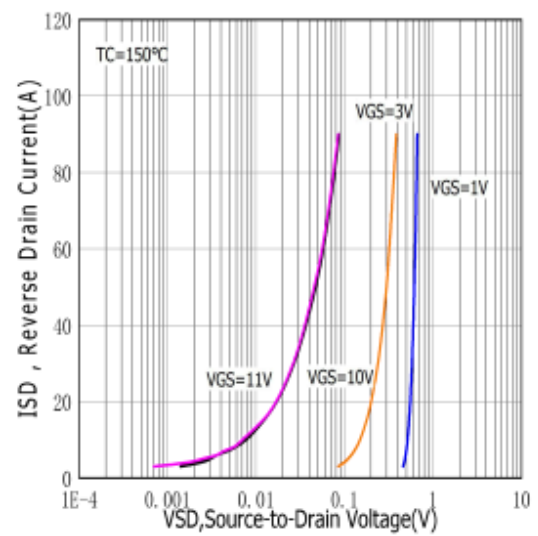
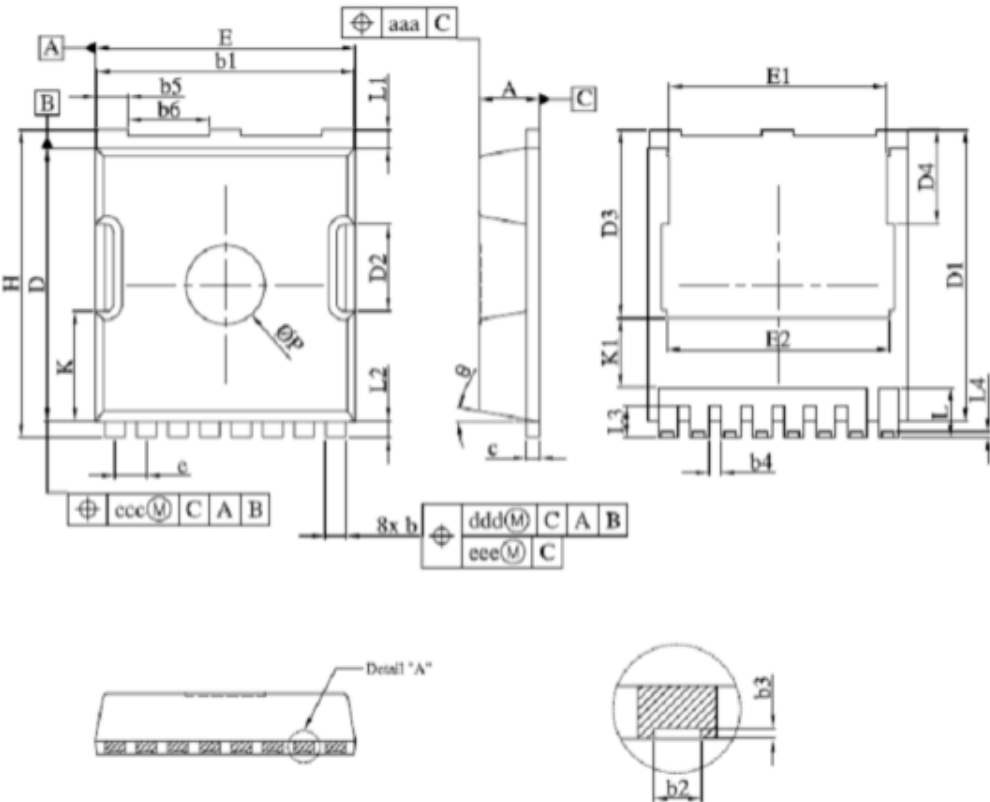


Figure.16 Typical Body Diode Transfer Characteristics



TOLL



SYMBOL	COMMON		
	MILLIMETER		
	MIN.	NOMINAL	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.86	0.85	0.55
b3	0.05	0.100	0.35
b4	0.30	0.40	0.50
b5	1.10	1.20	1.30
b6	3.00	3.10	3.20
c	0.40	0.50	0.60
D	10.28	10.38	10.55
D1	10.98	11.08	11.18
D2	3.20	3.30	3.40
D3	7.00	7.15	7.30
D4	3.44	3.59	3.74
e	1.10	1.20	1.30
E	9.80	9.90	10.00
E1	8.20	8.30	8.40
E2	8.35	8.50	8.65
H	11.50	11.68	11.85
K	4.08	4.18	4.28
K1	2.45	—	—
L	1.60	1.90	2.10
L1	0.50	0.70	0.90
L2	0.50	0.60	0.70
L3	1.00	1.20	1.30
L4	0.13	0.23	0.33
P	2.85	3.00	3.15
θ	10° REEF		
aaa	0.20		
ccc	0.20		
ddd	0.25		
eee	0.20		