

preliminary

CMY77002NE-33

20V N-Channel MOSFET

Features

- Advanced Trench Power MOSFET technology
- Low $R_{DS(on)}$
- High Speed switching
- 100% EAS Guaranteed
- Green product
- ESD Protected

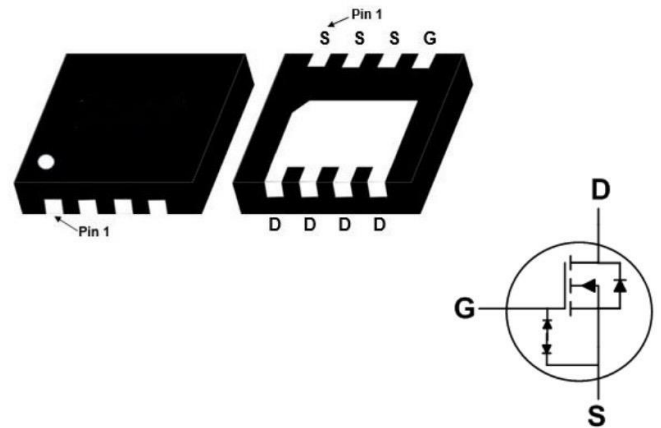
Product Summary

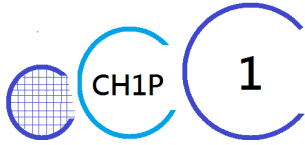
Item	Typical Value	Unit
V_{DS}	20	V
$R_{DS(on)}$ @ $V_{GS} = 4.5V$ (Max)	2	m Ω
I_D	50	A

Applications

- Power Management in NB, PC
- Battery protection switch

DFN3.3x3.3 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}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current, $T_C = 25^\circ\text{C}/100^\circ\text{C}$	I_D	50/39	A
Pulsed Drain Current	I_{DM}	200	A
Single Pulse UIS Capability, 0.1mH	E_{AS}	80	mJ
Maximum Power Dissipation, $T_C = 25^\circ\text{C}$	P_D	83	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	$R_{\theta JA}$	55	$^\circ\text{C}/\text{W}$

Electrical Characteristics

Static ($T_J=25^\circ\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20	---	---	V
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	---	---	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16V, V_{GS} = 0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS} = 16V, V_{GS} = 0V, T_J=125^\circ\text{C}$	---	---	5	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 20A$	---	---	2	m Ω
		$V_{GS} = 2.5V, I_D = 20A$	---	---	2.7	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	---	1.0	V
Dynamic ($T_J=25^\circ\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$	---	4307	---	pF
Output Capacitance	C_{oss}		---	501	---	
Reverse Transfer Capacitance	C_{rss}		---	321	---	
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 20A, V_{GS} = 10V$	---	77	---	nC
Gate-Source Charge	Q_{gs}		---	8.7	---	
Gate-Drain Charge	Q_{gd}		---	14	---	
Turn-on delay time	$T_{d(on)}$	$V_{DS} = 15V, I_D = 20A, V_{GS} = 10V, R_G = 3\Omega,$	---	10.2	---	ns
Rise time	T_r		---	11.7	---	
Turn-off delay time	$T_{d(off)}$		---	56.4	---	
Fall time	T_f		---	16.2	---	
Reverse Diode Characteristics						
Continuous Source Current	I_S	$V_G = V_D = 0V, \text{Force Current}$	---	---	50	A
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_F = 1A$	---	---	1.2	V

Typical Characteristics

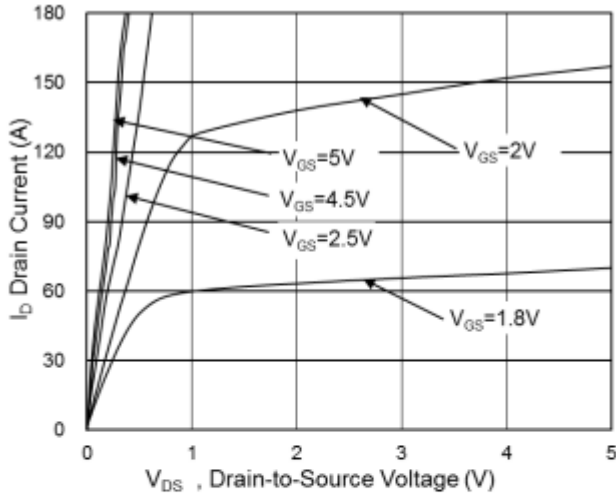


Fig.1 Typical Output Characteristics

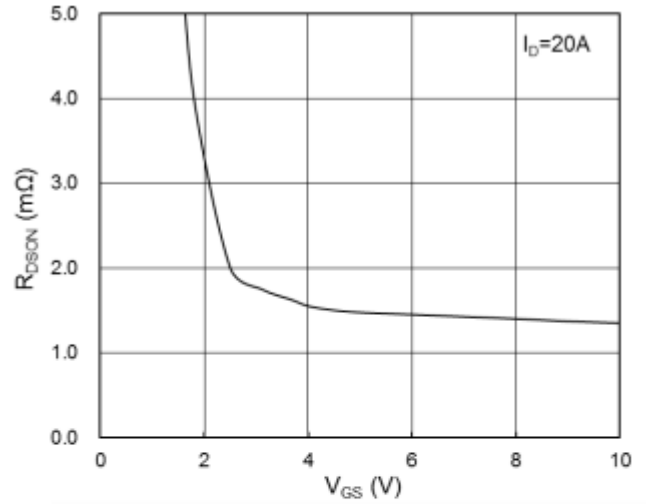


Fig.2 On-Resistance vs. Gate-Source Voltage

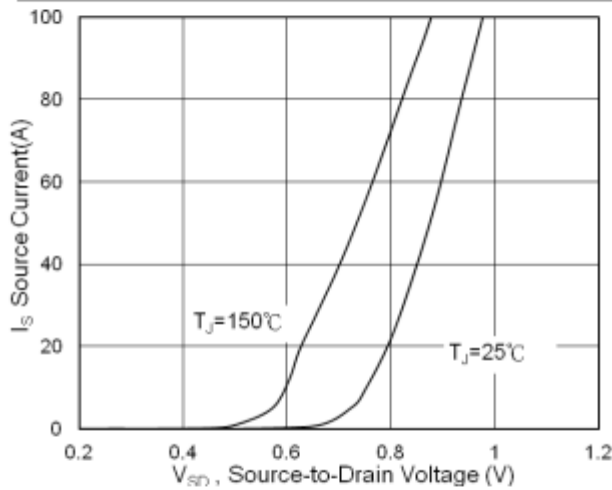


Fig.3 Forward Characteristics of Reverse

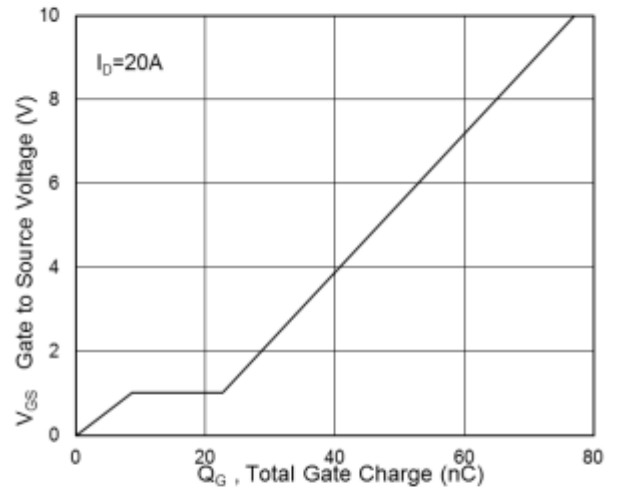


Fig.4 Gate-Charge Characteristics

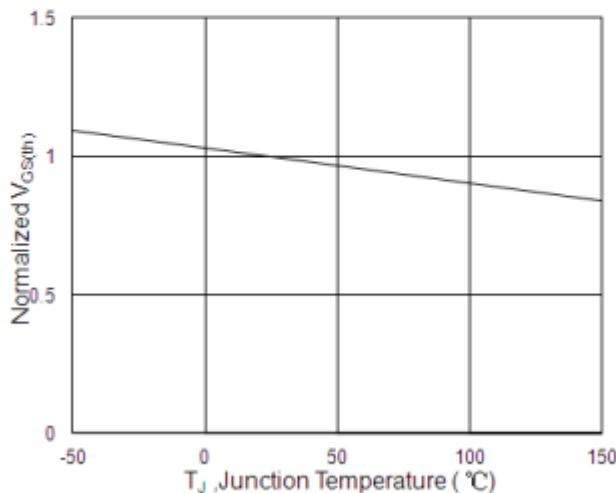


Fig.5 Normalized V_{GS(th)} vs. T_J

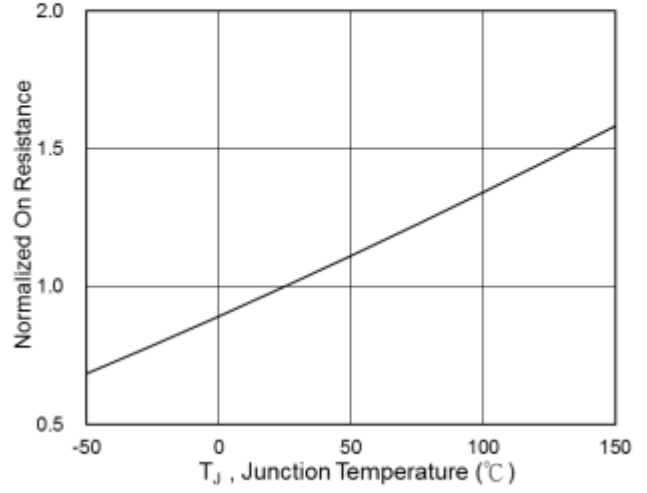


Fig.6 Normalized R_{DS(on)} vs. T_J

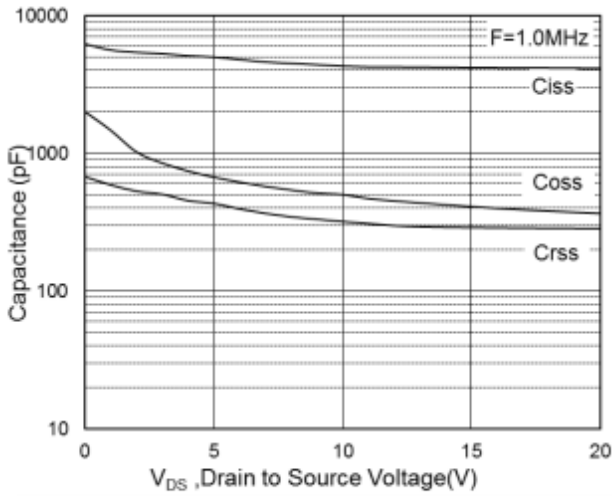


Fig.7 Capacitance

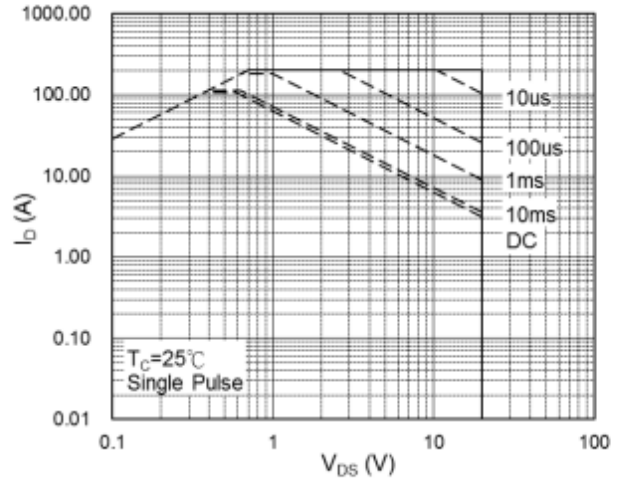


Fig.8 Safe Operating Area

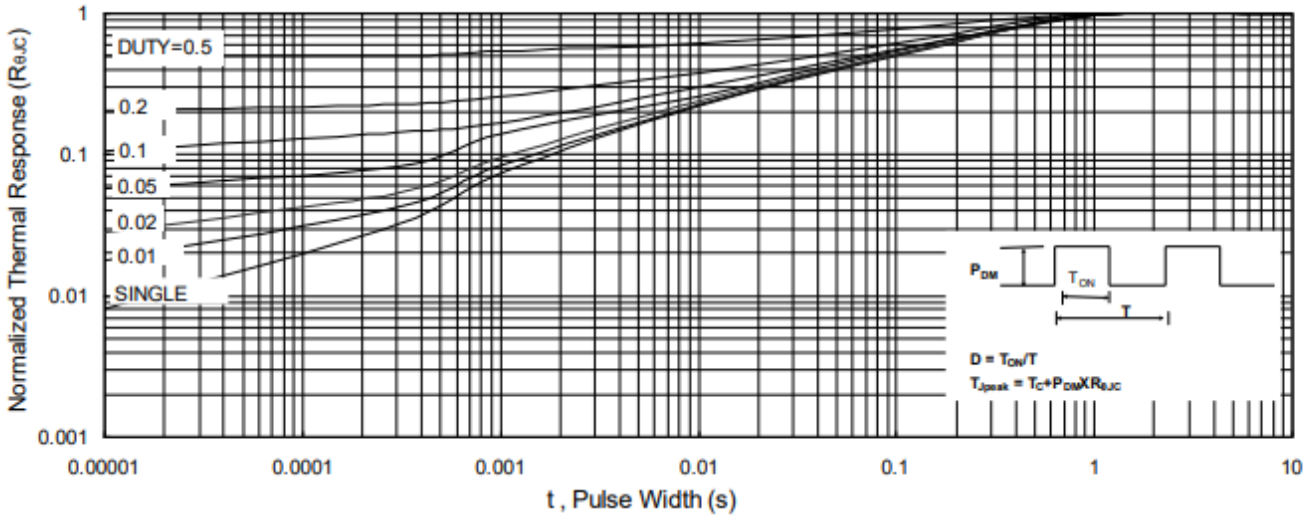


Fig.9 Normalized Maximum Transient Thermal Impedance

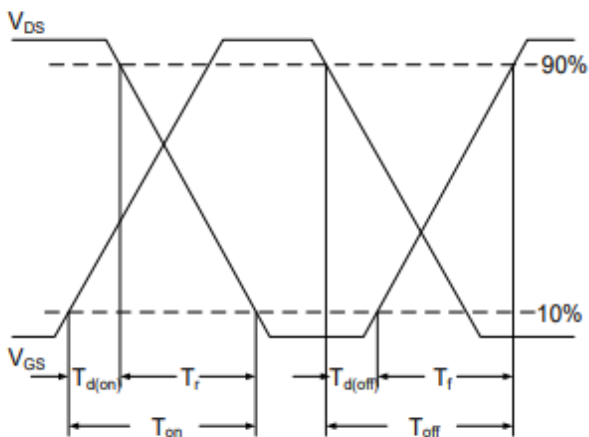


Fig.10 Switching Time Waveform

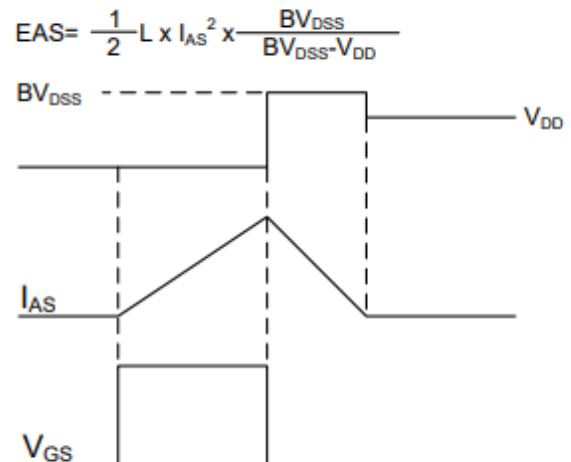
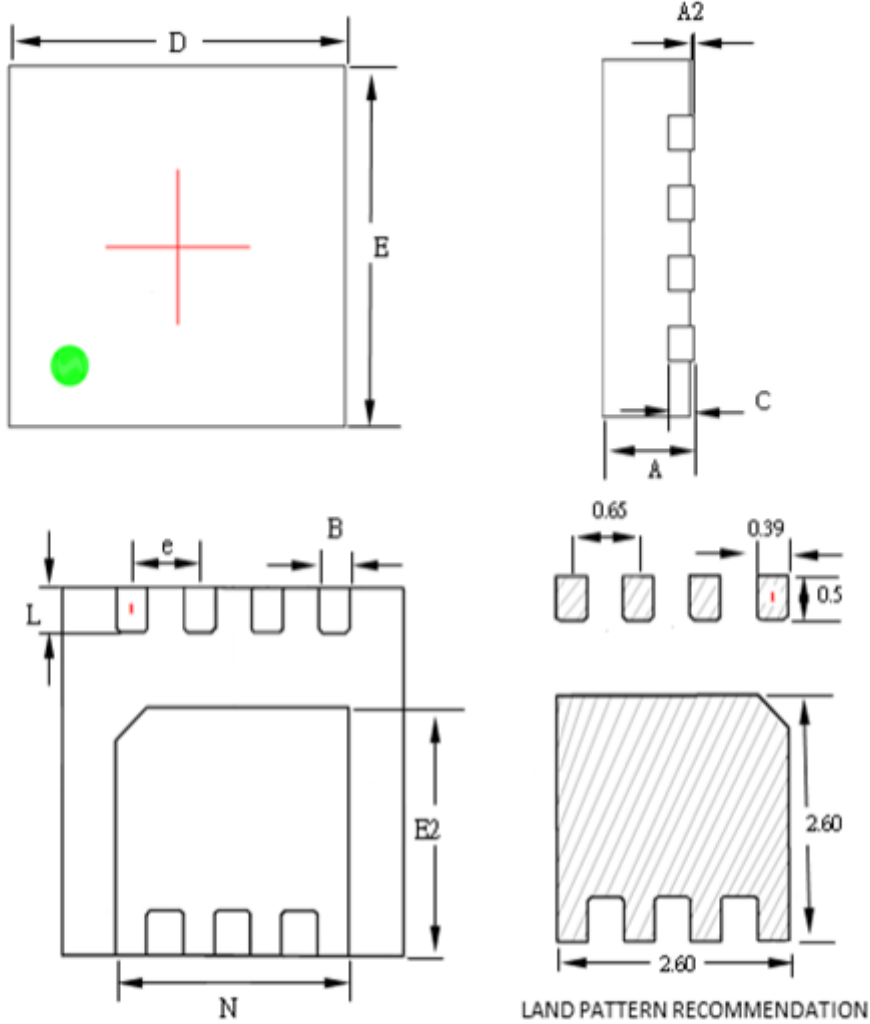


Fig.11 Unclamped Inductive Switching Waveform

DFN3.3x3.3 8L Package Information



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A2	0.00	--	0.05	0.000	--	0.002
B	0.24	0.30	0.35	0.009	0.012	0.014
C	0.10	0.15	0.25	0.004	0.006	0.010
D	3.15	3.30	3.40	0.124	0.130	0.134
E	3.15	3.30	3.40	0.124	0.130	0.134
E2	2.15	2.25	2.35	0.085	0.089	0.093
L	0.35	0.40	0.45	0.014	0.016	0.018
N	2.10	2.25	2.35	0.083	0.089	0.093
e	--	0.65	--	--	0.026	--