

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Surface-mounted package
Super Trench
Tj max 175°C
Advanced trench cell design
MSL1

Applications

Motor drivers
DC - DC Converter

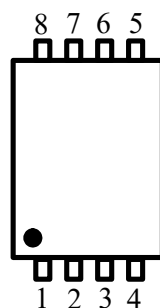
Quick reference

$BV \geq 40\text{ V}$
 $P_{tot} \leq 35\text{ W}$
 $I_D \leq 189\text{ A}$
 $R_{DS(ON)} \leq 1.0\text{ m}\Omega @ V_{GS} = 10\text{ V}$
 $R_{DS(ON)} \leq 1.5\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

2. Pin Description

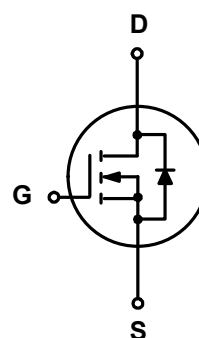
Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Simplified Outline



Top View
PDFN5x6-8L

Symbol



3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C = 25 °C	40	-	V
V _{GS}	Gate-Source Voltage	T _C = 25 °C	-	± 20	V
I _D *	Drain Current	T _C = 25 °C, V _{GS} = 10 V	-	189	A
I _{DM} *,**	Pulsed Source Current	T _C = 25 °C, V _{GS} = 10 V	-	756	A
P _{tot} *	Total Power Dissipation	T _C = 25 °C	-	35	W
T _{stg}	Storage Temperature		- 55	175	°C
T _J	Junction Temperature		-	175	°C
I _S	Diode Forward Current	T _C = 25 °C	-	189	A
E _{AS} *	Single Pulsed Avalanche Energy	V _{DD} = 40 V , L= 1.0 mH	-	1200	mJ
R _{θJA} *	Thermal Resistance- Junction to Ambient		-	41	°C / W
R _{θJC} *	Thermal Resistance- Junction to Case		-	1.1	

Notes :

* Surface Mounted on 1 in² pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

4. Marking Information

Product Name	Marking
CI011N04	011N04

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
CI011N04	PDFN5*6			5000	

6. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

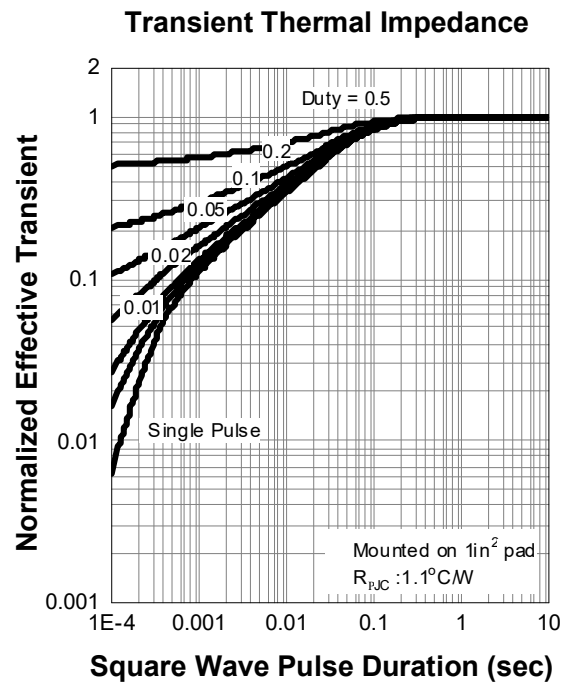
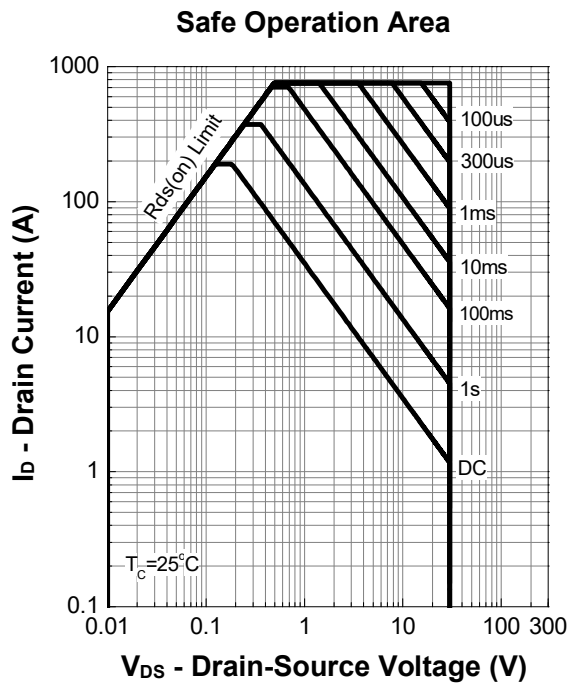
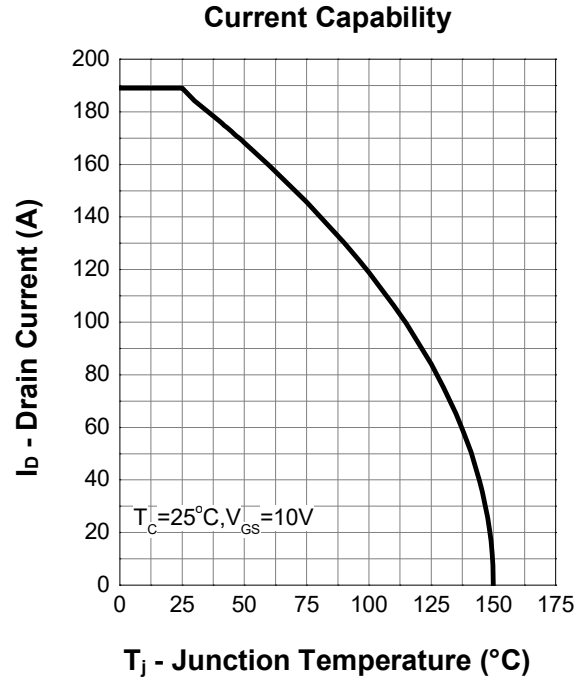
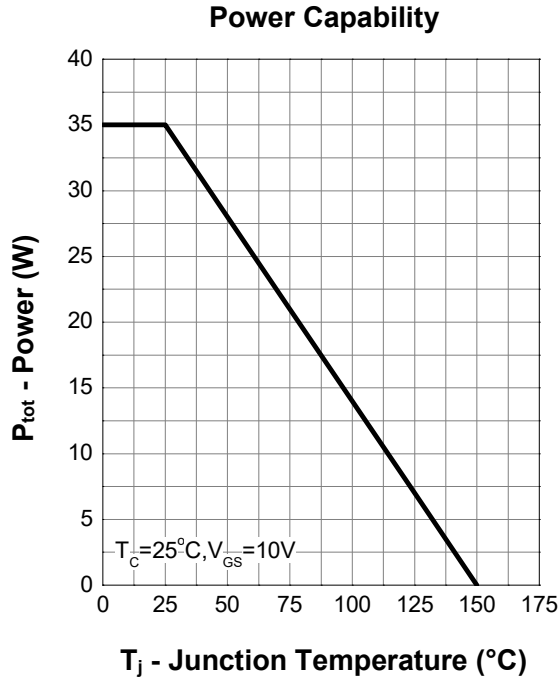
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	40	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	-	2	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} = 32 V, V _{GS} = 0 V	-	-	1	μA
		T _J = 85 °C	-	-	30	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} = 10 V, I _D = 30 A	-	0.9	1.0	m Ω
		V _{GS} = 4.5 V, I _D = 20 A	-	1.3	1.5	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 30 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} = 30 A, dI _{SD} /dt = 100 A/μs	-	87	-	nS
Q _{rr}	Reverse Recovery Charge		-	127	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 20 V Frequency = 1 MHz	-	8055	-	pF
C _{oss}	Output Capacitance		-	2819	-	
C _{rss}	Reverse Transfer Capacitance		-	117	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 20 V, V _{GEN} = 10 V, R _G = 4.5 Ω, R _L = 0.66 Ω, I _{DS} = 30 A	-	15	-	nS
t _r	Turn-on Rise Time		-	74	-	
t _{d(off)}	Turn-off Delay Time		-	140	-	
t _f	Turn-off Fall Time		-	92	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 20 V, V _{GS} = 10 V, I _{DS} = 30 A	-	145	-	nC
Q _{gs}	Gate-Source Charge		-	29	-	
Q _{gd}	Gate-Drain Charge		-	26	-	

Notes :

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

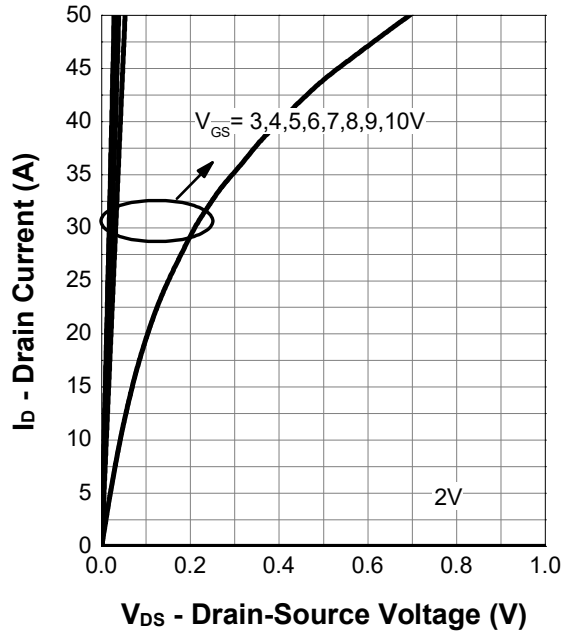
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics (Cont.)

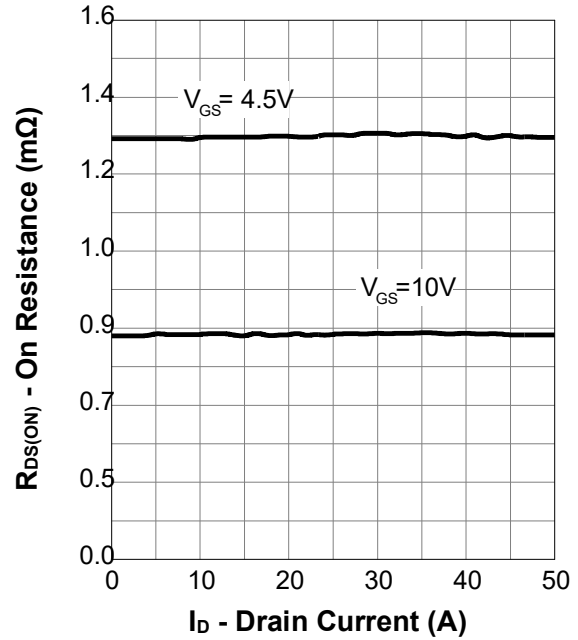


7. Typical Characteristics (Cont.)

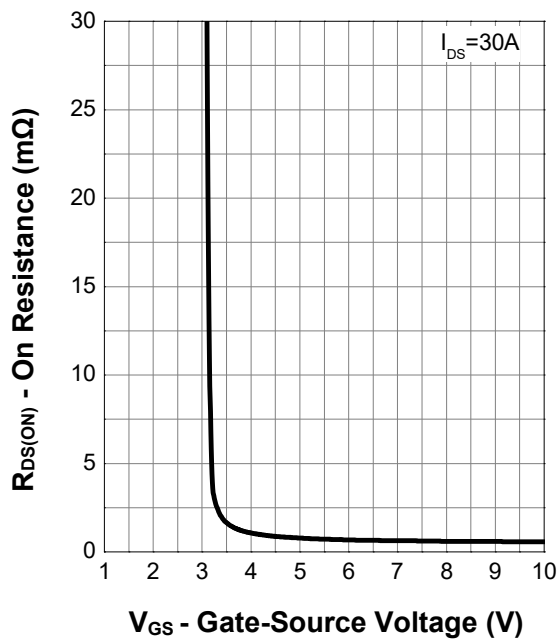
Output Characteristics



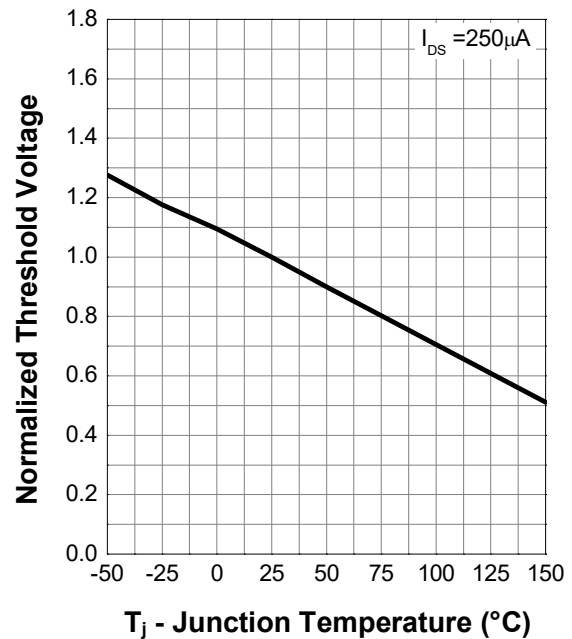
On Resistance



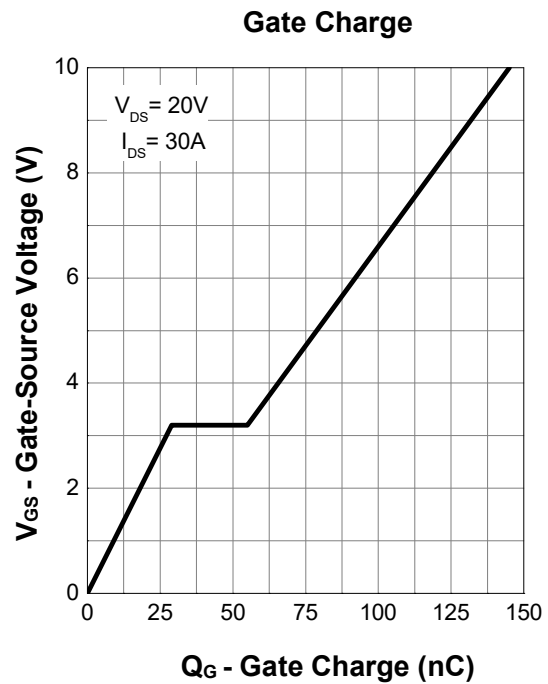
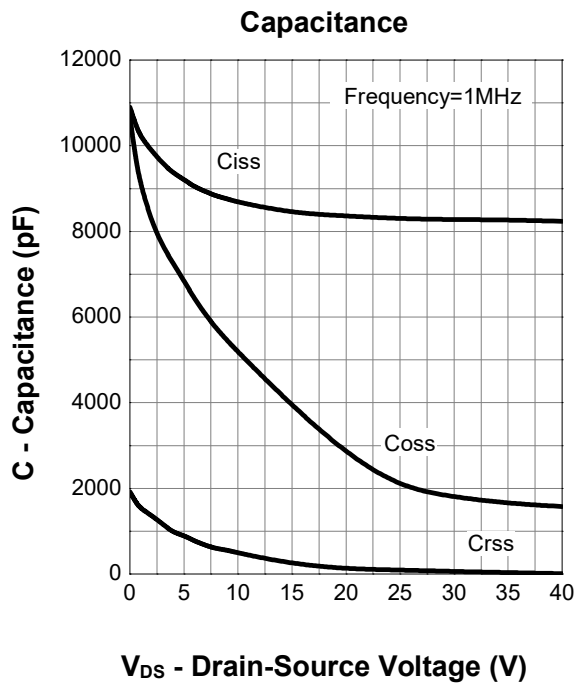
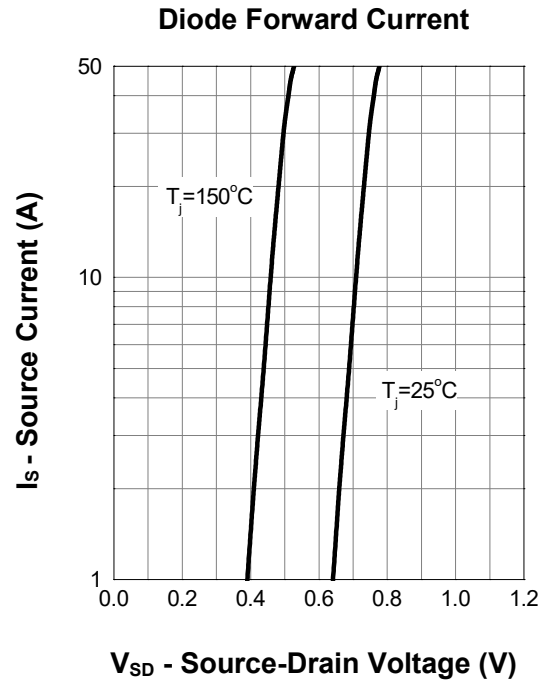
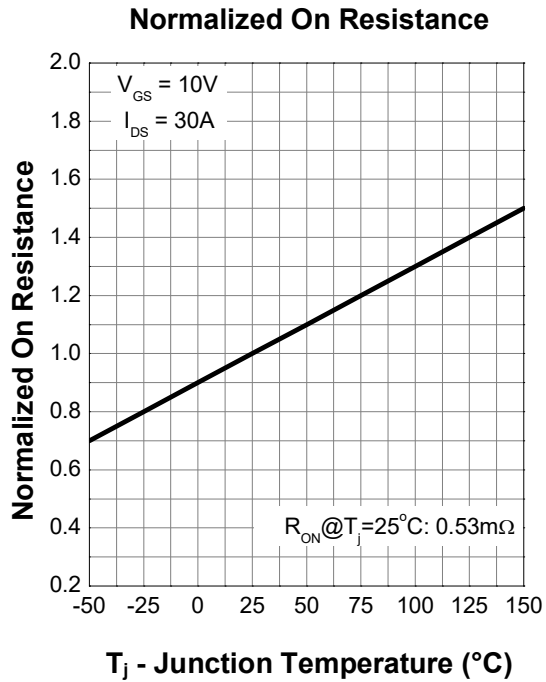
Transfer Characteristics



Normalized Threshold Voltage

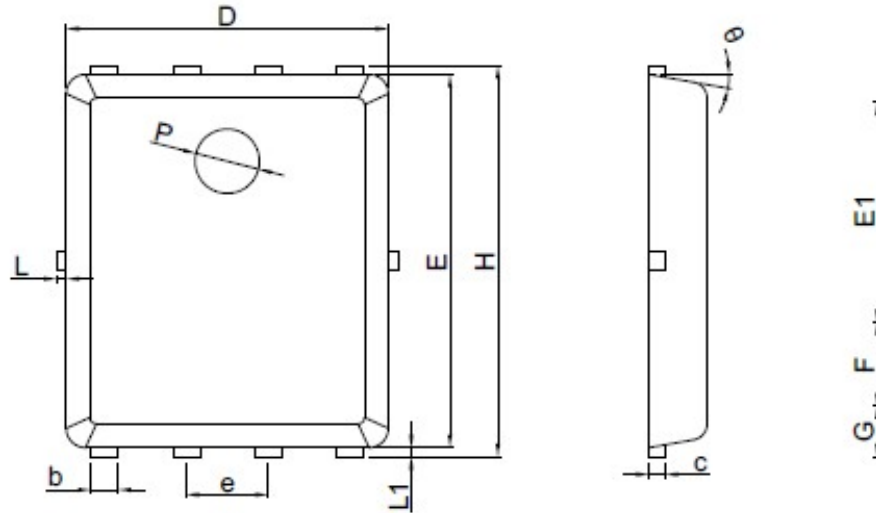


7. Typical Characteristics (Cont.)



8. Package Dimensions

PDFN5x6 - 8L Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
b	0.35	0.49
c	0.254REF	
D	4.90	5.10
F	1.40REF	
E	5.70	5.90
e	1.27BSC	
H	5.95	6.20
L1	0.10	0.18
G	0.60REF	
K	4.00REF	
L	-	0.15
J	0.95BSC	
P	1.00REF	
E1	3.40REF	
θ	6°	14°
R	0.25REF	