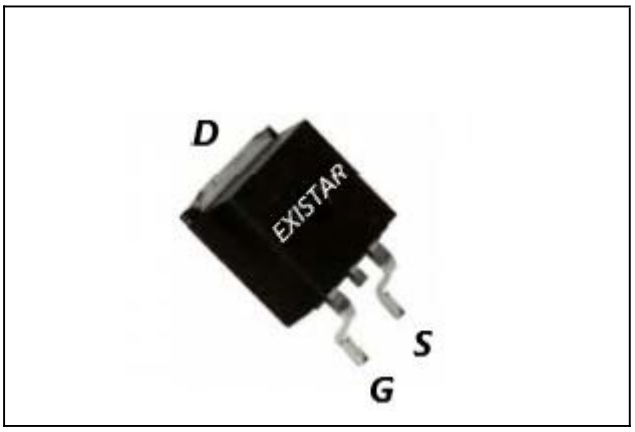
N-Channel 80V MOSFET

E080N020CL1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
80V	20 @ V_{GS} = 10V	35

TO-252

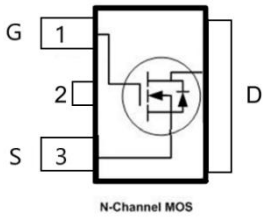


Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Power switch
- PD charger
- Moto driver



Pb-free
RoHS
COMPLIANT
HALOGEN
FREE

Package And Ordering Information

Ordering code	Package	Marking
E080N020CL1	TO-252	E080N020CL1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TO-252	2500	1	2500

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	80	V
ID, pulse	140	A
RDS(ON), max @ VGS=10V	20	mΩ
Qg	13	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	80	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	35	A
	T_C=100°C		-	
Pulsed drain current		$I_{D,pulse}$	140	
Avalanche energy, single pulse		E_{AS}	22	mJ
Power dissipation	T_C=25°C	P_D	35	W
	T_A=25°C		-	
Operating junction and storage temperature range		T_J, T_{stg}	-55 To 175	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	4.3	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	62	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	80			V	V_{GS} = 0, I_D = 250 μA
Gate-source threshold voltage	$V_{GS(th)}$	1.3	1.8	2.0	V	V_{DS} = V_{GS}, I_D = 250 μA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS} = 80 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		13.6	20	mΩ	V_{GS} = 10 V, I_D = 12 A
Drain-source on-resistance	$R_{DS(on)}$		19	25	mΩ	V_{GS} = 4.5 V, I_D = 9 A
Forward transconductance	gfs		-		S	V_{DS} = 5 V, I_D = 30 A

Gate resistance	Rg		1.5		Ω	f=1MHz
Gate Charge						
Total gate charge	Qg		13		nC	V_{DS} = 40 V, I_D = 20 A, V_{GS} = 10 V
Gate-source charge	Qgs		2.4			
Gate-drain charge	Qgd		2.5			
Dynamic						
Turn-on delay time	$t_{d(on)}$		7		ns	V_{DS} = 40 V, I_D =20 A, V_{GS} = 10 V, R_{GEN} = 2 Ω
Rise time	t_r		4			
Turn-off delay time	$t_{d(off)}$		17			
Fall time	t_f		2.6			
Input capacitance	C_{iss}		894		pF	V_{DS} =25 V, V_{GS} = 0 V, f = 100kHz
Output capacitance	C_{oss}		337			
Reverse transfer capacitance	C_{rss}		24			
Body Diode						
Diode forward voltage	V_{SD}			1.3	V	V_{GS} = 0 V, I_S = 20 A
Reverse recovery time	t_{rr}		40		ns	V_R= 40 V, I_S =20 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		35		nC	

Electrical Characteristics Diagrams

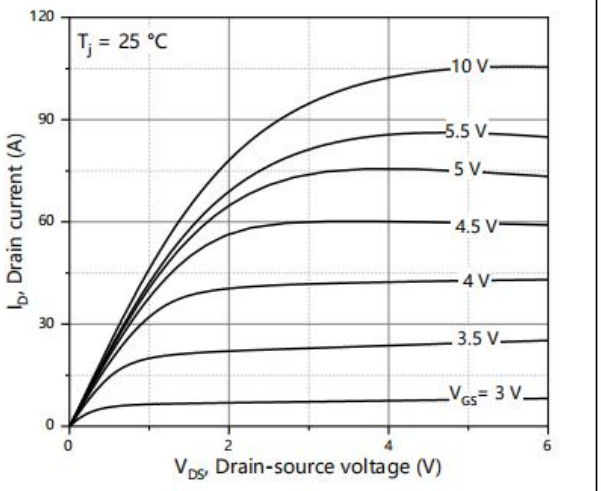


Figure 1. Typ. output characteristics

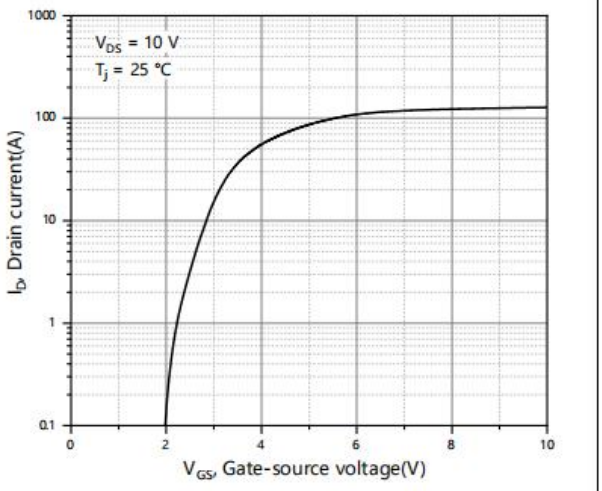


Figure 2. Typ. transfer characteristics

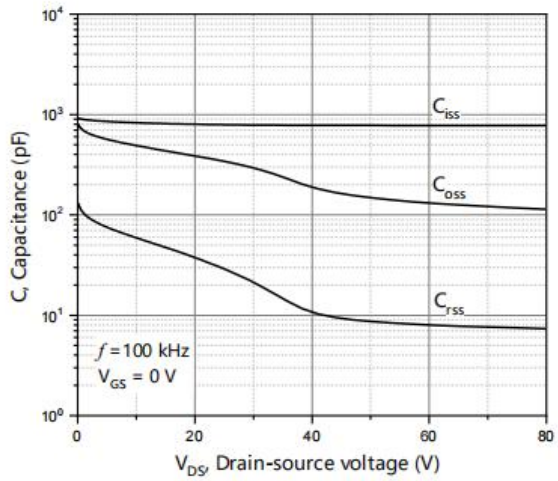


Figure 3. Typ. capacitances

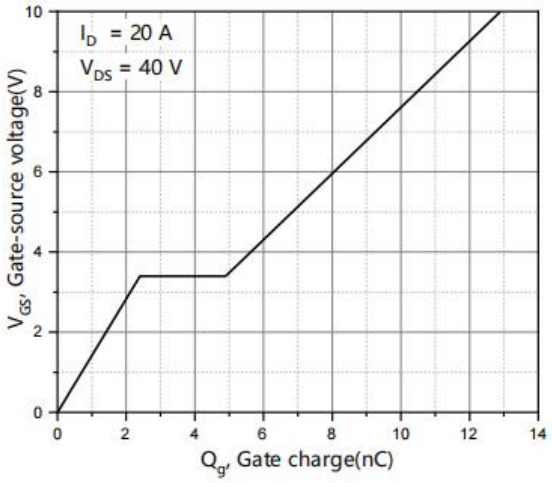


Figure 4. Typ. gate charge

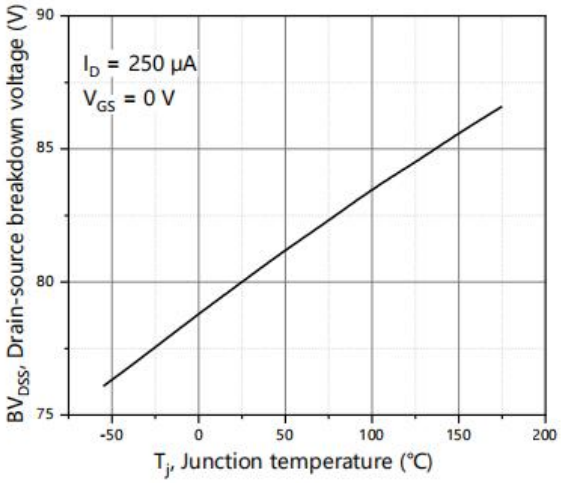


Figure 5. Drain-source breakdown voltage

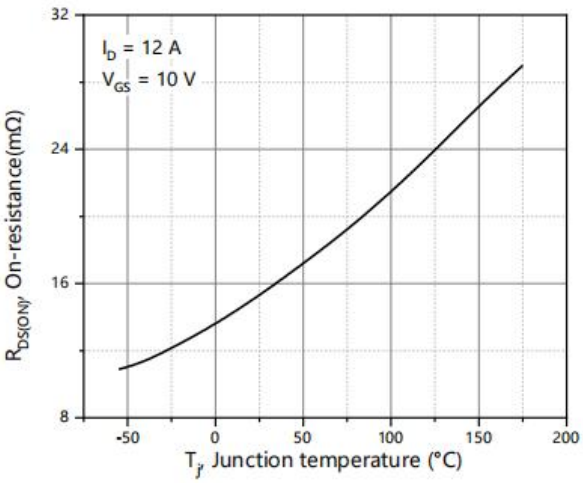


Figure 6. Drain-source on-state resistance

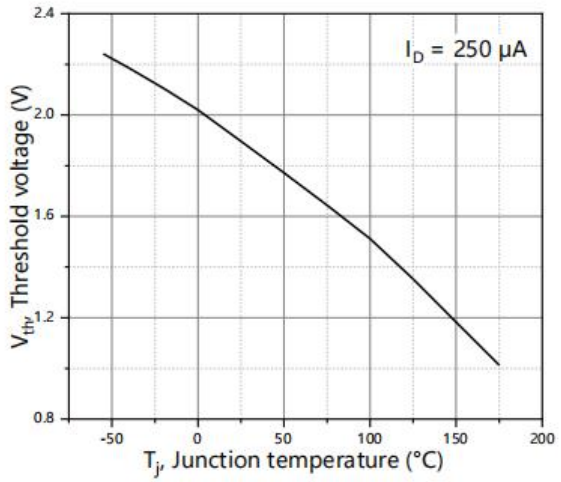


Figure 7. Threshold voltage

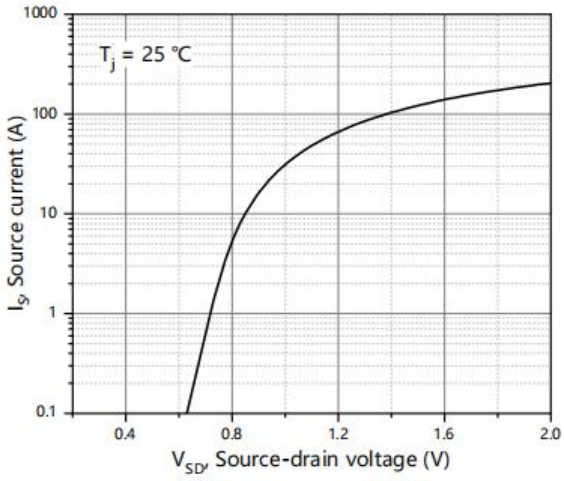


Figure 8. Forward characteristic of body diode

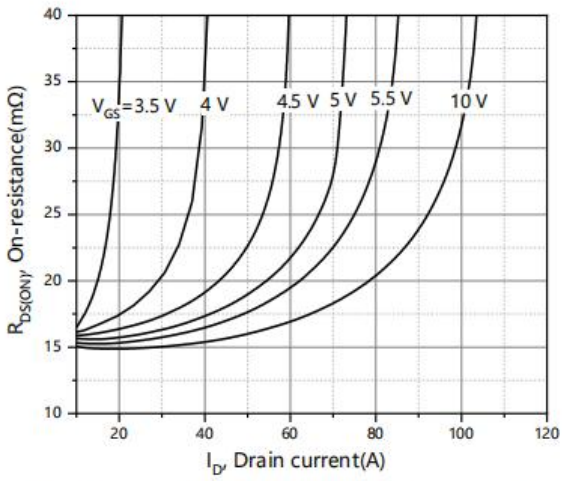


Figure 9. Drain-source on-state resistance

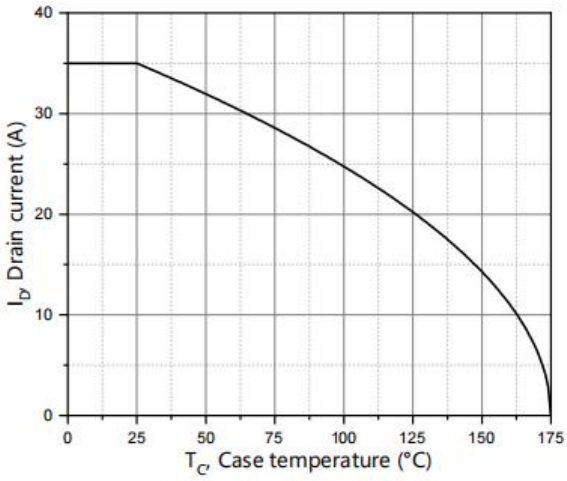


Figure 10. Drain current

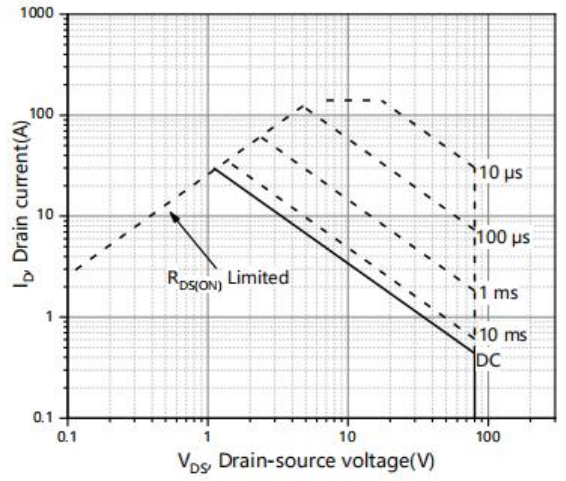


Figure 11. Safe operation area T_C=25℃

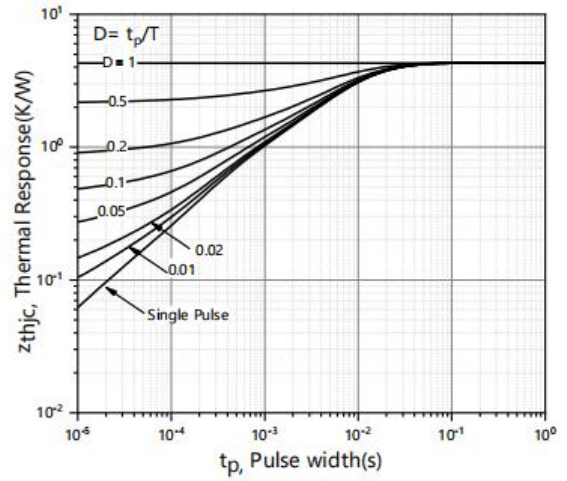


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

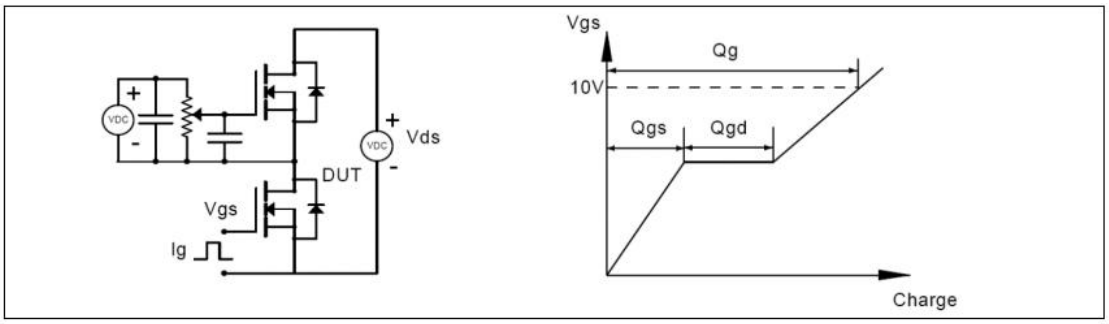


Figure 1. Gate charge test circuit & waveform

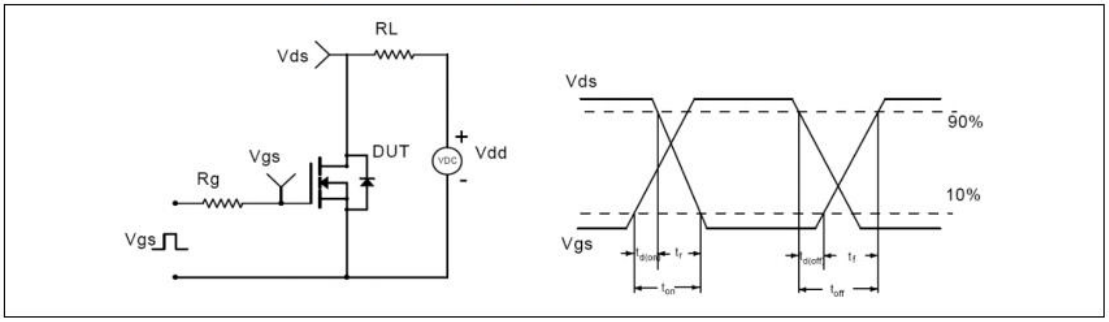


Figure 2. Switching time test circuit & waveforms

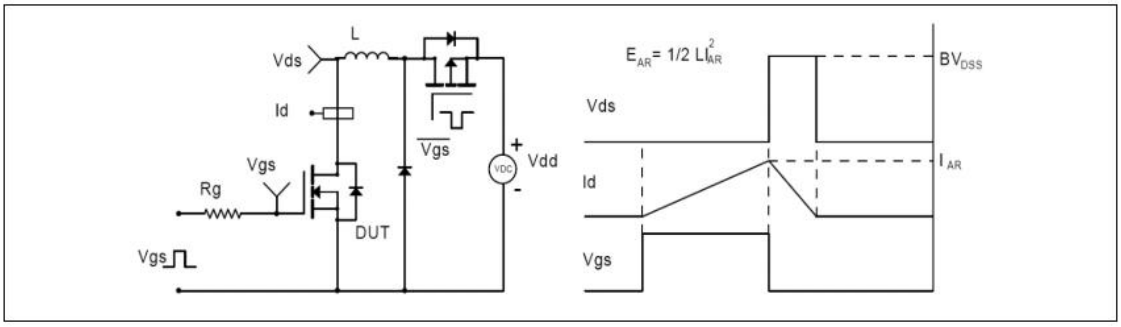


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

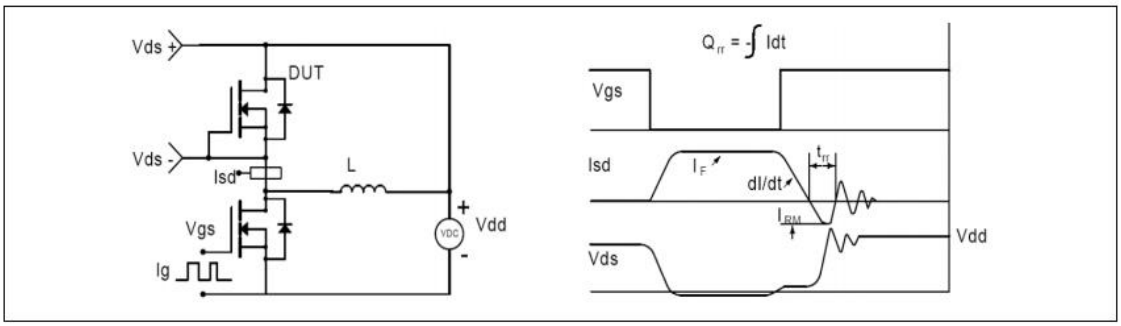
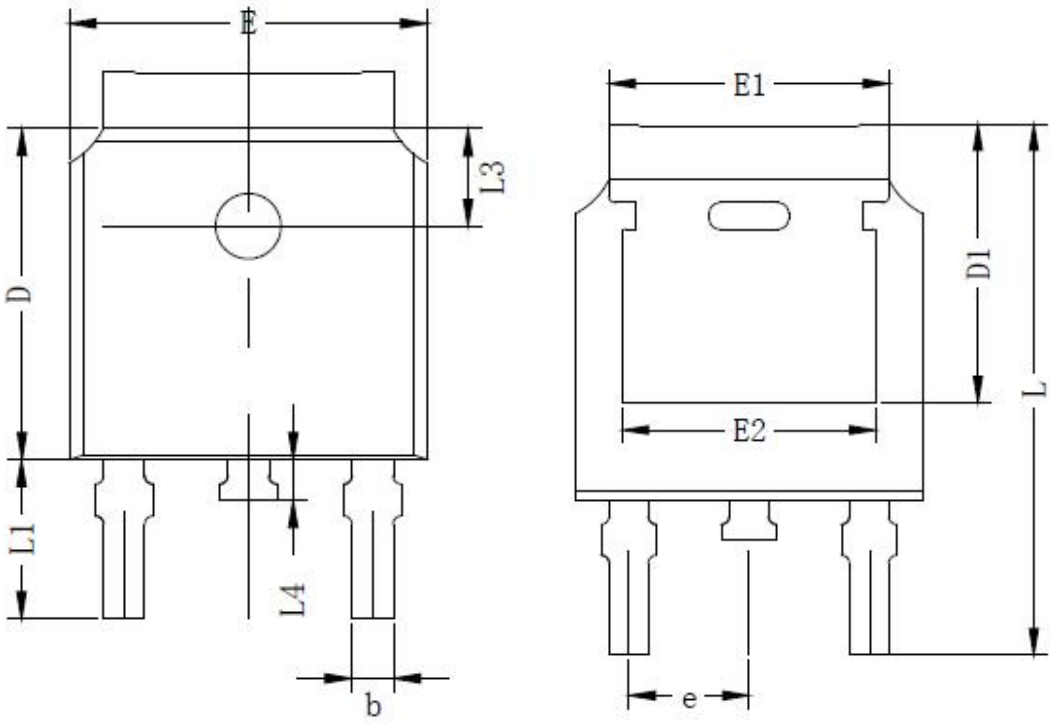


Figure 4. Diode reverse recovery test circuit & waveforms

Package Outline Dimensions



SYMBOL	MIN	NOM	MAX
A	2.10	2.30	2.50
A1	0.97	1.07	1.17
A2	0.00	–	0.12
b	0.66	0.76	0.86
c	0.45	0.51	0.60
D	5.90	6.10	6.30
D1	5.10	5.30	5.45
E	6.40	6.60	6.80
E1	5.10	5.33	5.45
E2	4.63	4.83	5.03
L	9.90	10.10	10.30
L1	2.74	2.94	3.14
L2	1.40	1.50	1.70
L3	1.65	1.80	1.95
L4	0.60	0.80	1.00
e	2.286BSC		
θ	5°	7°	10°
θ1	0°	–	3°

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