

General Description

The 2810B uses advanced trench technology and design to provide excellent RDS(ON). This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Features

- N-channel-Enhancement mode
- Lower On-resistance
- 100% Avalanche Tested
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	70	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current	55	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current	38	A
I_{DM}	Pulsed Drain Current	220	A
EAS	Single Pulse Avalanche Energy ¹	264	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	100	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	50	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	1.5	$^\circ\text{C/W}$

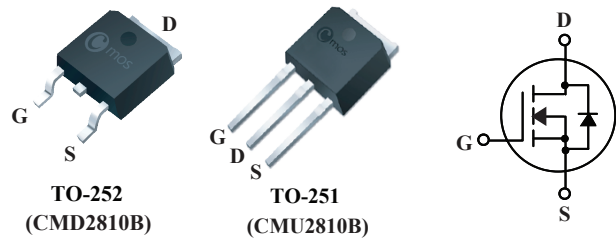
Product Summary

BVDSS	RDS(ON)	ID
70V	6.8m Ω	55A

Applications

- DC-DC converters
- Power switching application
- Ideal for high-frequency switching and synchronous rectification

TO-252/251 Pin Configuration



N-Channel Enhancement Mode Field Effect Transistor
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	70	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=20\text{A}$	---	6.1	6.8	$\text{m}\Omega$
		$V_{GS}=6\text{V}$, $I_D=20\text{A}$	---	9.4	11	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu\text{A}$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=70\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=70\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=20\text{A}$	---	25	---	S
R_g	Gate Resistance	$V_{DS}=0\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	1	---	Ω
Q_g	Total Gate Charge	$I_D=20\text{A}$	---	27	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=40\text{V}$	---	8.5	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10\text{V}$	---	5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=40\text{V}$	---	12	---	ns
T_r	Rise Time	$R_{GEN}=3\Omega$	---	8.5	---	
$T_{d(off)}$	Turn-Off Delay Time	$V_{GS}=10\text{V}$	---	22	---	
T_f	Fall Time	$R_L=2\Omega$	---	5.5	---	
C_{iss}	Input Capacitance	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	1600	---	pF
C_{oss}	Output Capacitance		---	600	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	

Diode Characteristics

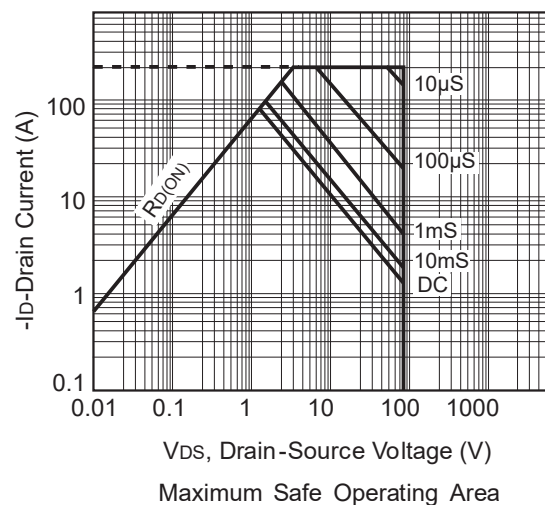
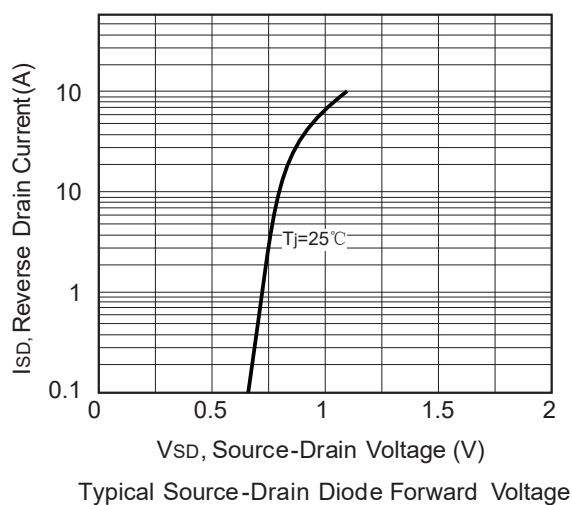
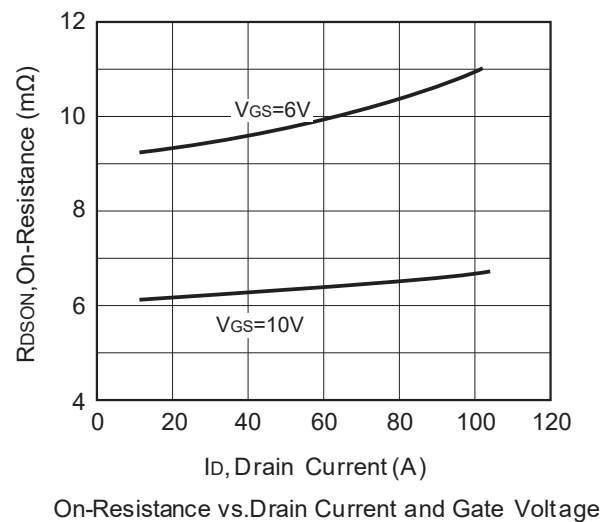
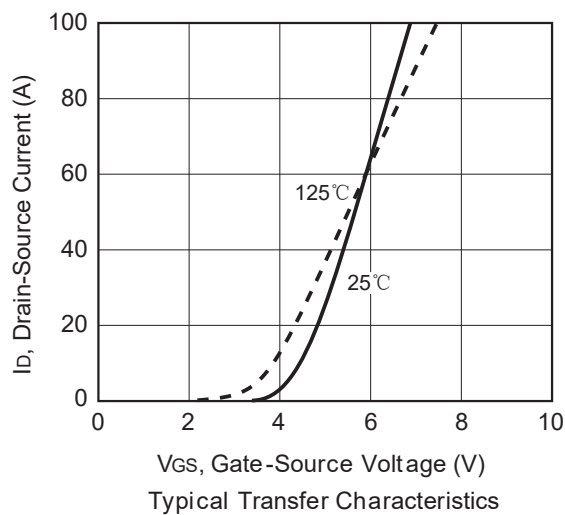
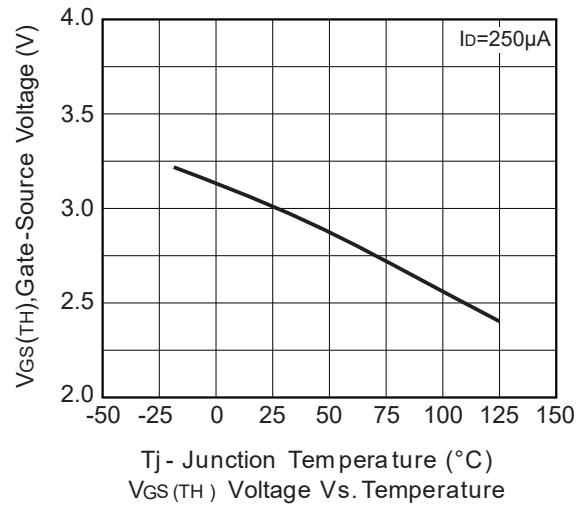
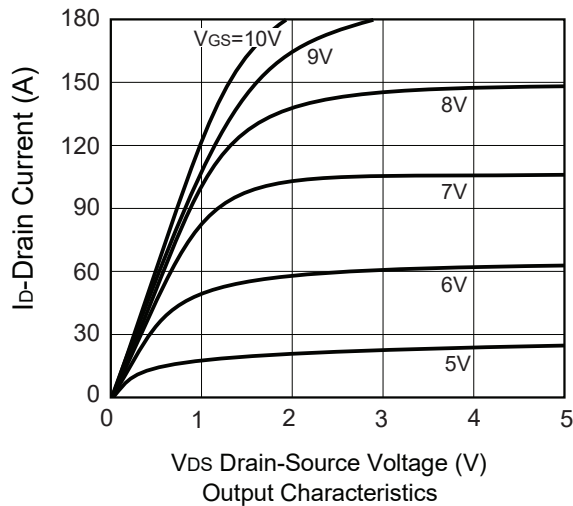
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0\text{V}$, Force Current	---	---	55	A
I_{SM}	Pulsed Source Current		---	---	220	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_S=20\text{A}$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

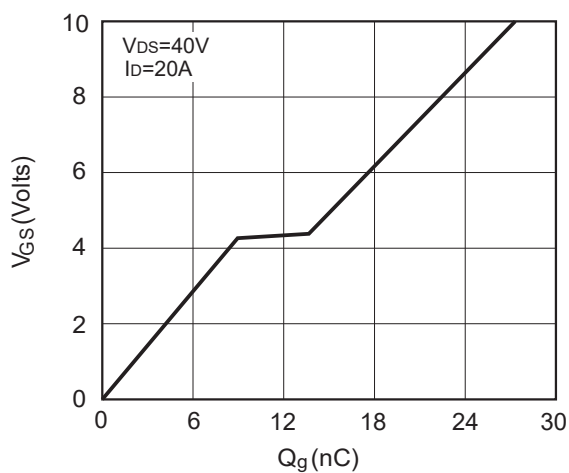
1.The EAS data shows Max. rating . The test condition is $V_{DD}=40\text{V}$, $V_{GS}=10\text{V}$, $L=1\text{mH}$, $I_{AS}=23\text{A}$.

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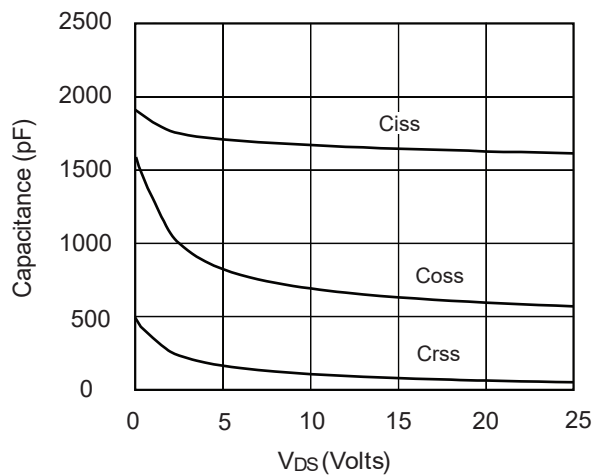
Typical Characteristics



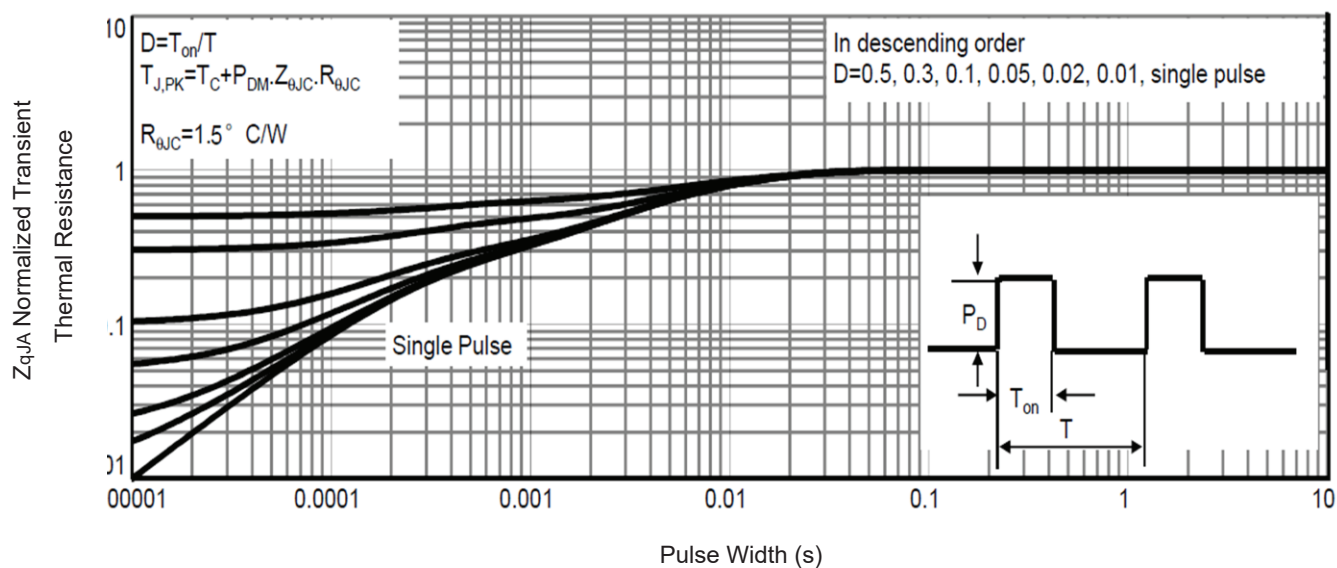
Typical Characteristics



Gate-Charge Waveforms



Capacitance Characteristics



Normalized Maximum Transient Thermal Impedance