

Description

The SX240N15T uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 150V$ $I_D = 240A$

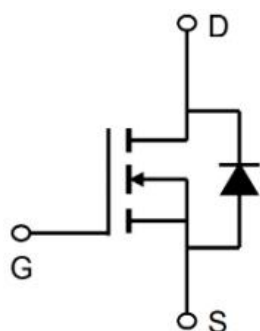
$R_{DS(ON)} < 5.8m\Omega$ @ $V_{GS}=10V$

Application

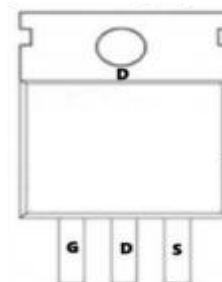
DC/DC Converter

LED Backlighting

Power Management Switches



TO-263-3L



Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	240	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V	185	A
I_{DM}	Pulsed Drain Current	720	A
E_{AS}	Single Pulse Avalanche Energy	1764	mJ
I_{AS}	Avalanche Current	64	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation ⁴	326	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	0.46	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	62	$^\circ C/W$

Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V ID=250μA	150	165		V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =140V, V _{GS} =0V			1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , ID=250μA	2.0	2.9	4.0	V
GFS	Forward Transconductance	V _{DS} =5V, I _D =15A		33		S
RDS(ON)	Drain-Source On-State Resistance	V _{GS} =10V, I _D =40A		4.8	5.8	mΩ
Ciss	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		4200		pF
Coss	Output Capacitance			2867		pF
Crss	Reverse Transfer Capacitance			215		pF
td(on)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =75V, RL=1.07Ω, RGEN=3Ω		18		nS
tr	Turn-on Rise Time			22		nS
td(off)	Turn-Off Delay Time			35		nS
tr	Turn-Off Fall Time			10		nS
Qg	Total Gate Charge	V _{GS} =10V, V _{DS} =75V, I _D =70A		65		nC
Qgs	Gate-Source Charge			20		nC
Qgd	Gate-Drain Charge			19		nC
ISD	Source-Drain Current (Body Diode)				240	A
VSD	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =20A			1.2	V
trr	Reverse Recovery Time	I _F =20A, dI/dt=500A/us		101		ns
Qrr	Reverse Recovery Charge	I _F =20A, dI/dt=500A/us		1,240		nC

Notes:

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=64A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

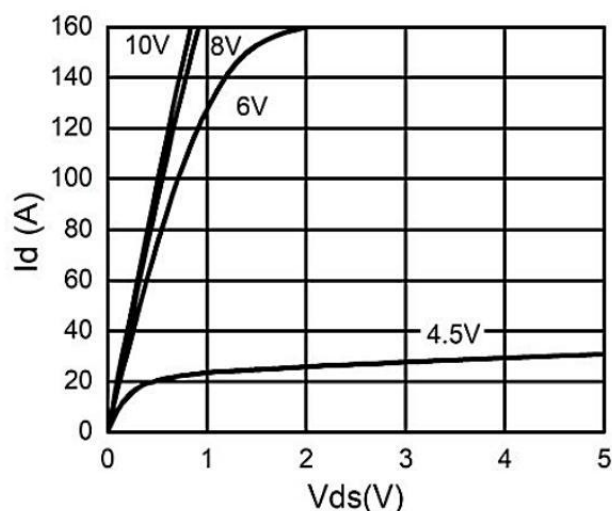


Figure 1. Output Characteristics

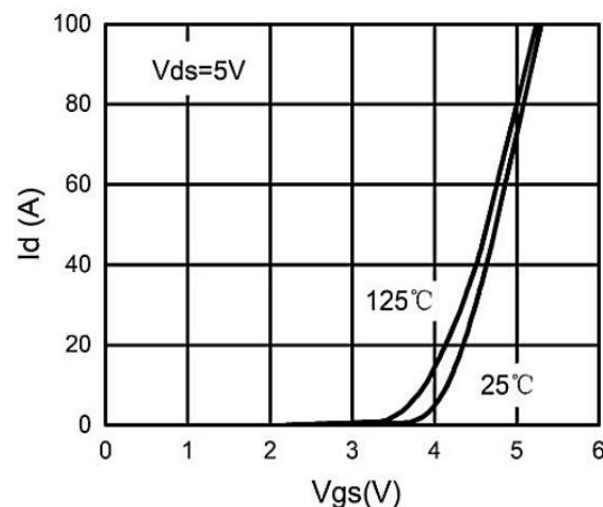


Figure 2. Transfer Characteristics

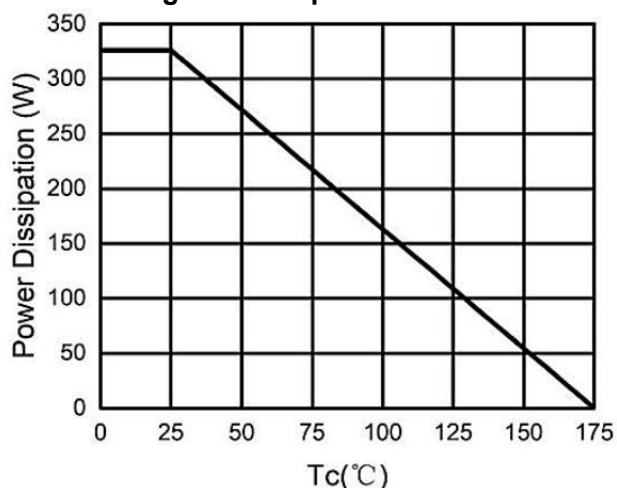


Figure 3. Power Dissipation

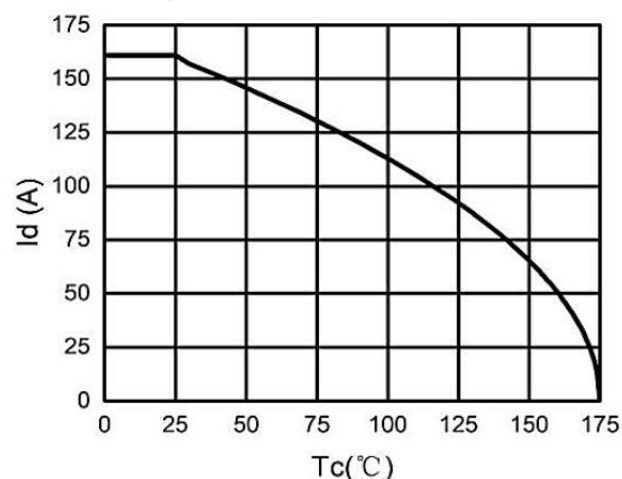


Figure 4. Drain Current

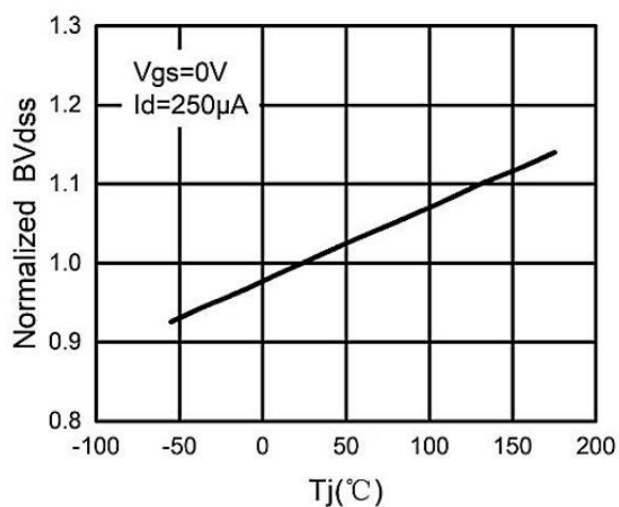


Figure 5. BVDSS vs Junction Temperature

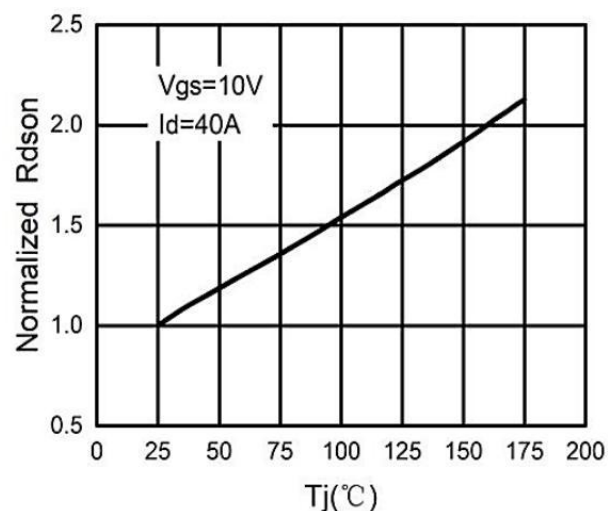


Figure 6. RDS(ON) vs Junction Temperature

Typical Characteristics

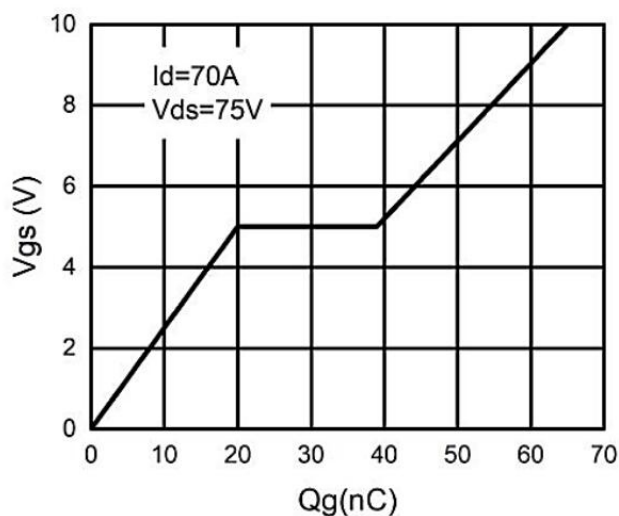


Figure 7. Gate Charge Waveforms

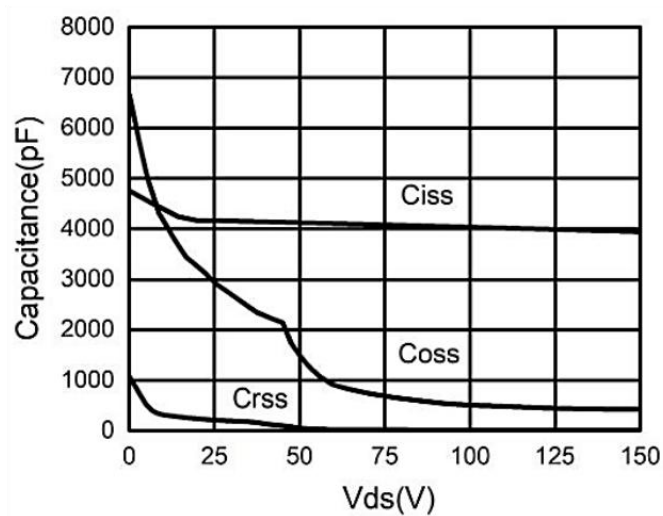


Figure 8. Capacitance

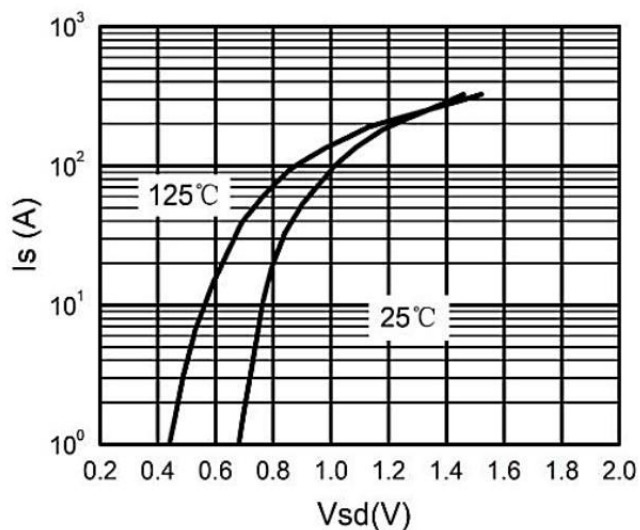


Figure 9. Body-Diode Characteristics

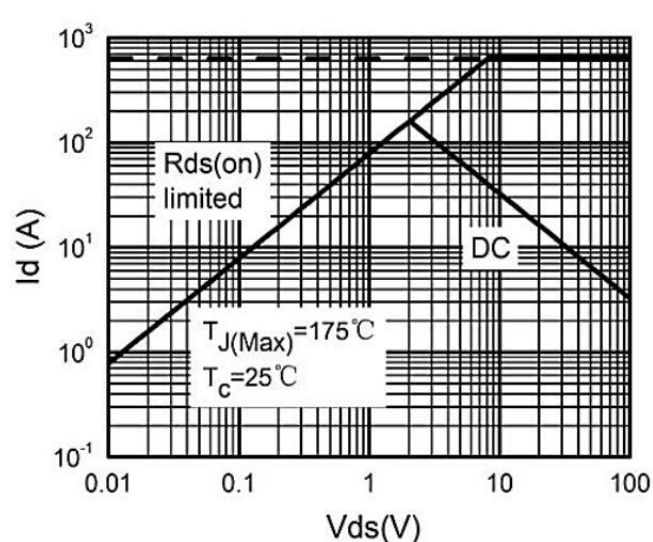


Figure 10. Maximum Safe Operating Area

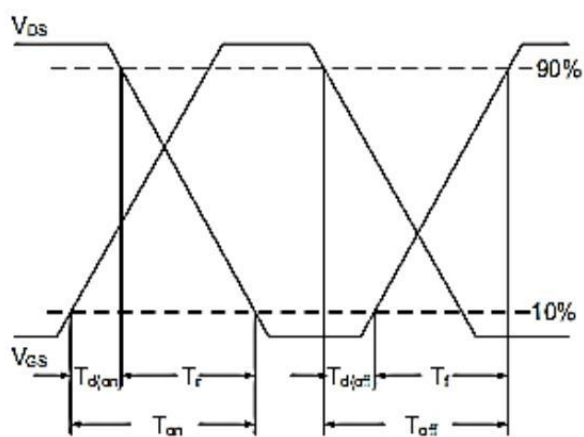


Figure 11. Switching Time Waveform

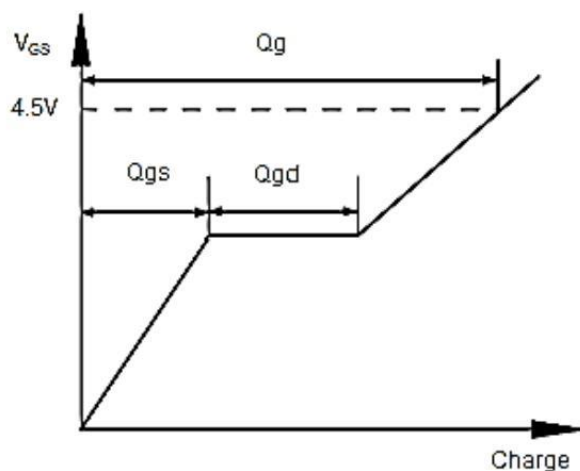
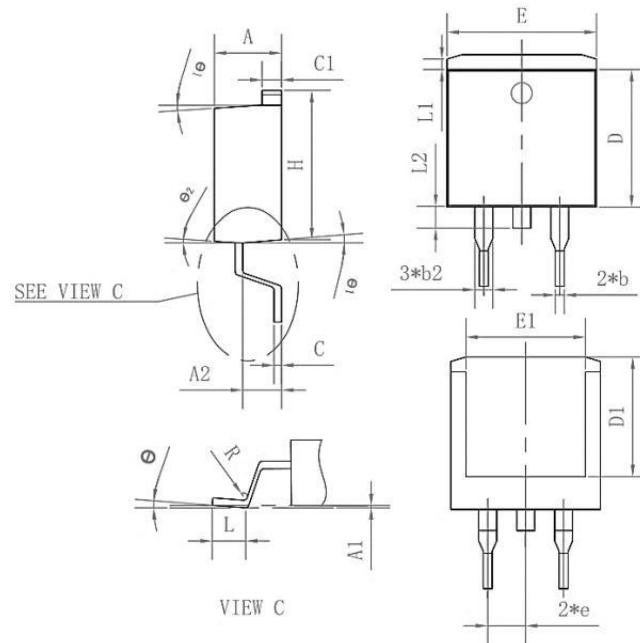


Figure 12. Gate Charge Waveform

Package Mechanical Data-TO-263-3L-SLK


Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
Θ1	4°	7°	10°
Θ2	0°	3°	6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-263-3L		800