

Description

The SPN80T06 uses advanced trench 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

$V_{DS} = 65V$ $I_D = 125A$

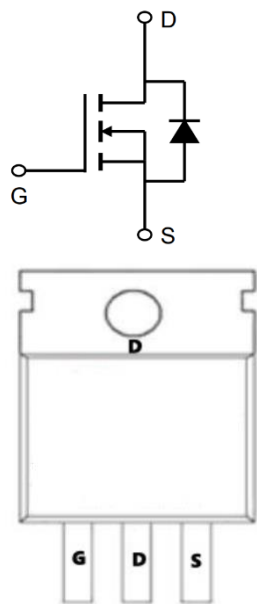
$R_{DS(ON)} < 5.6m\Omega$ @ $V_{GS}=10V$ (Type: 4.8m Ω)

Application

Battery protection

Load switch

Uninterruptible power supply



TO-263



TO-220

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
SPN80T06	TO-220-3L	SPN80T06	1000
SPN80T06	TO-263-3L	SPN80T06	800

Absolute Maximum Ratings@ $T_J=25^{\circ}C$ (unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	65	V
V_{GS}	Gate source voltage	± 25	V
I_D	Continuous drain current ¹⁾	125	A
I_{DM}	Pulsed drain current ²⁾	492	A
I_{AS}	Diode forward current	55	A
P_D	Power dissipation	172	W
E_{AS}	Single pulsed avalanche energy ³⁾	225	mJ
T_{stg}, T_J	Operation and storage temperature	-55 to 150	$^{\circ}C$
$R_{\theta JC}$	Thermal resistance, junction-case	1.4	$^{\circ}C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62.5	$^{\circ}C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	65	72	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0	2.8	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V _{GS} =10V, I _D =55A	-	4.8	5.6	mΩ
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1.0MHz	-	3135	-	pF
C _{oss}	Output Capacitance		-	521	-	pF
Crss	Reverse Transfer Capacitance		-	306	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =55A, V _{GS} =10V	-	77	-	nC
Q _{gs}	Gate-Source Charge		-	18	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	30	-	nC
td(on)	Turn-on Delay Time	V _{DS} =30V, I _D =55A, R _G =1.8Ω, V _{GS} =10V	-	15	-	ns
t _r	Turn-on Rise Time		-	89	-	ns
td(off)	Turn-off Delay Time		-	36	-	ns
t _f	Turn-off Fall Time		-	91	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	123	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	492	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =550A, dI/dt=100A/μs	-	32	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	31	-	nC

Note :

- 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 .The EAS data shows Max. rating .
- 3、The test cond ≅ 300us duty cycle ≅ 2%, duty cycle ition is T_J =25°C, VDD =35V, V_G =10V, R_G =25Ω, L=0.5mH, I_{AS} =55A
- 4、The power dissipation is limited by 175°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.

Electrical Characteristics Diagrams

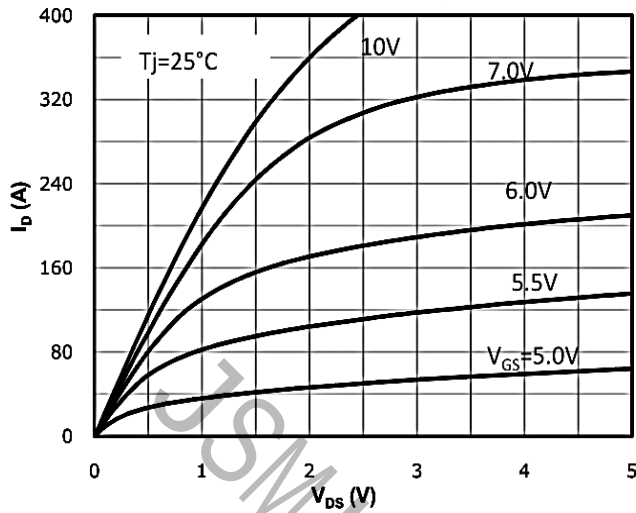


Figure1: Output Characteristics

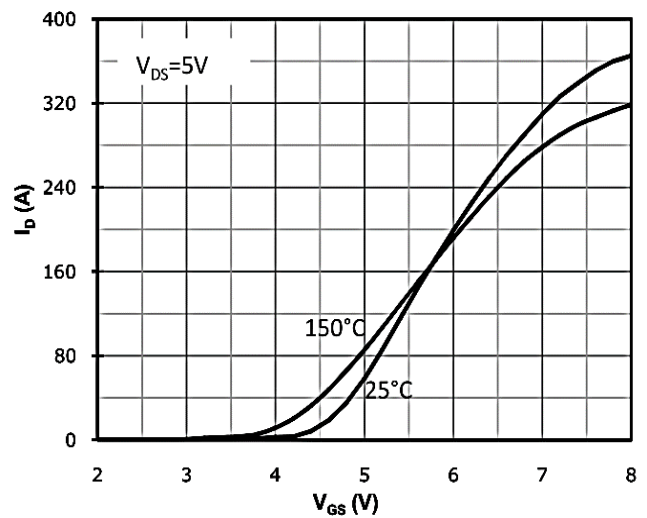


Figure 2: Typical Transfer Characteristics

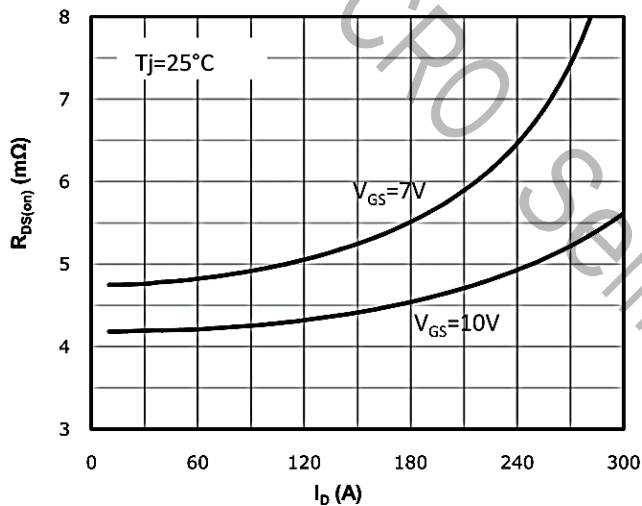


Figure 3: R_{DS(on)} vs Drain Current and

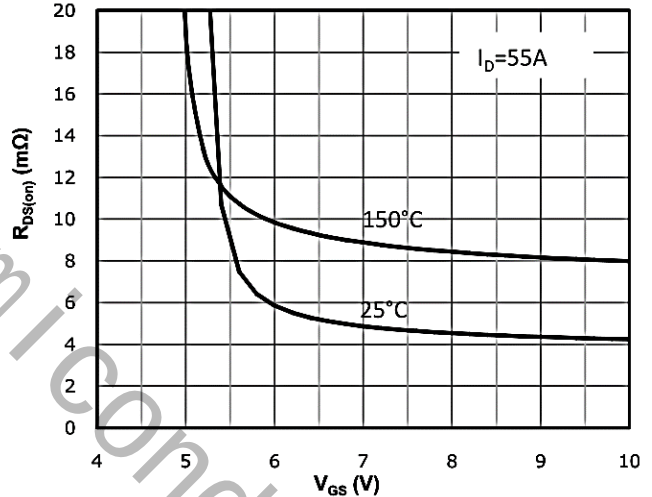


Figure 4: R_{DS(on)} vs Gate Voltage

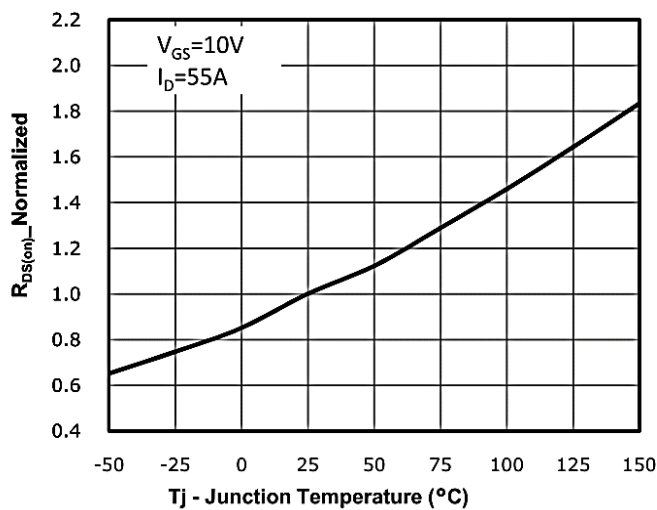


Figure 5: R_{DS(on)} vs. Temperature

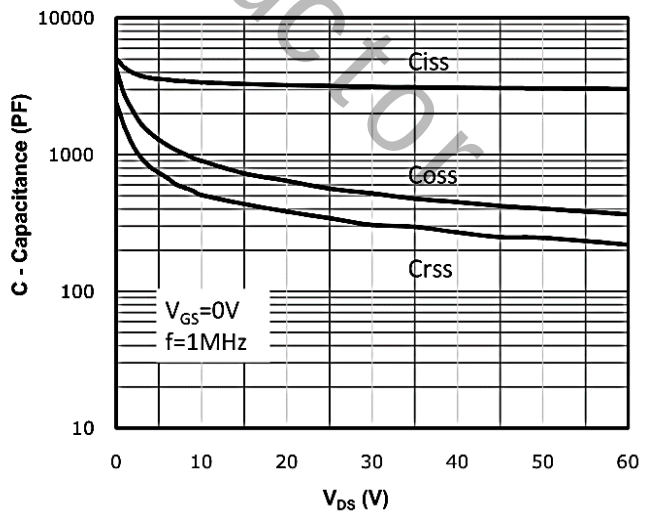


Figure 6: Capacitance Characteristics

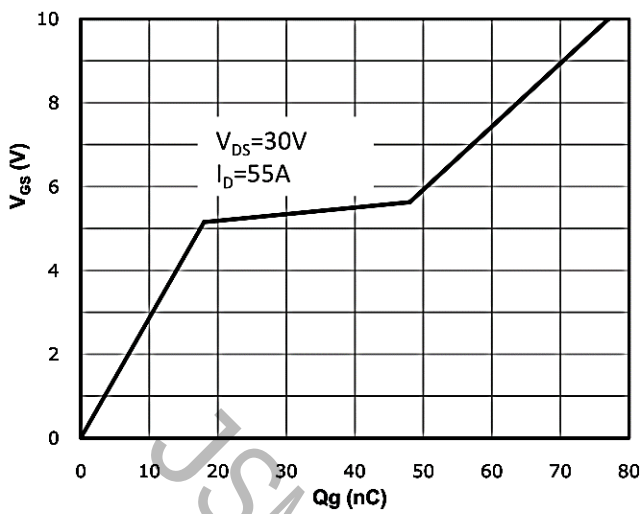


Figure 7: Gate Charge Characteristics

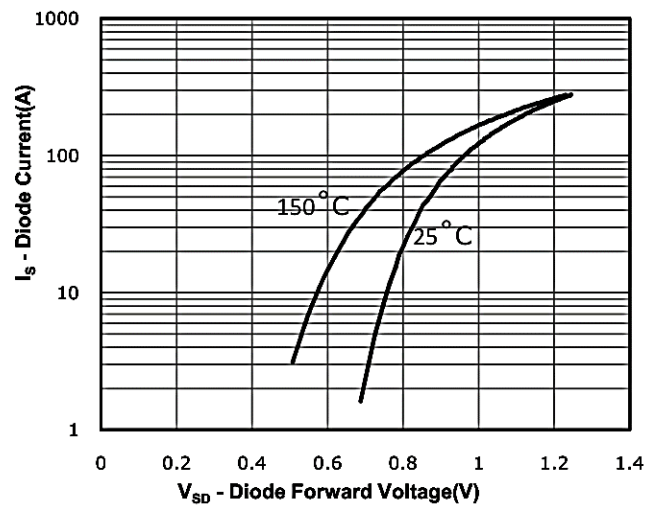


Figure 8: Body-diode Forward Characteristics

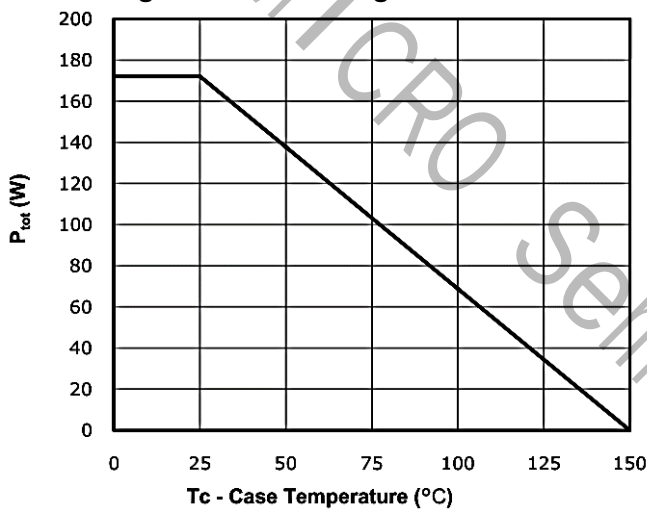


Figure 9: Power Dissipation

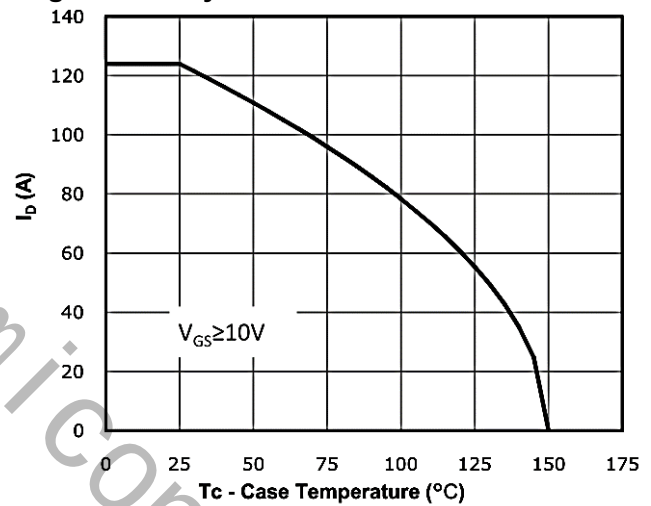


Figure 10: Drain Current Derating

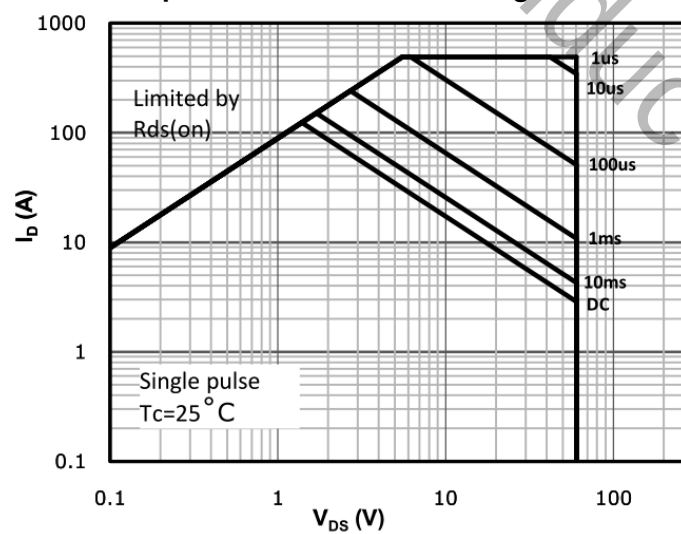
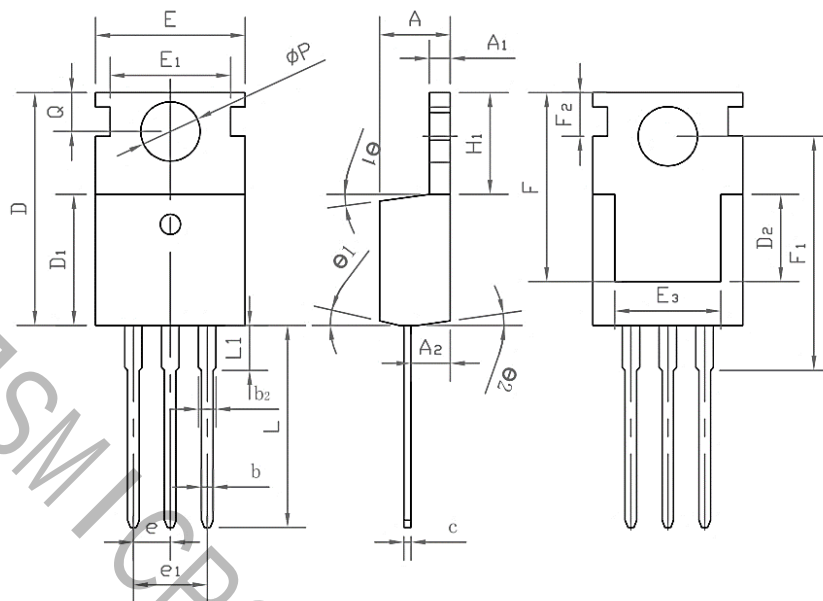


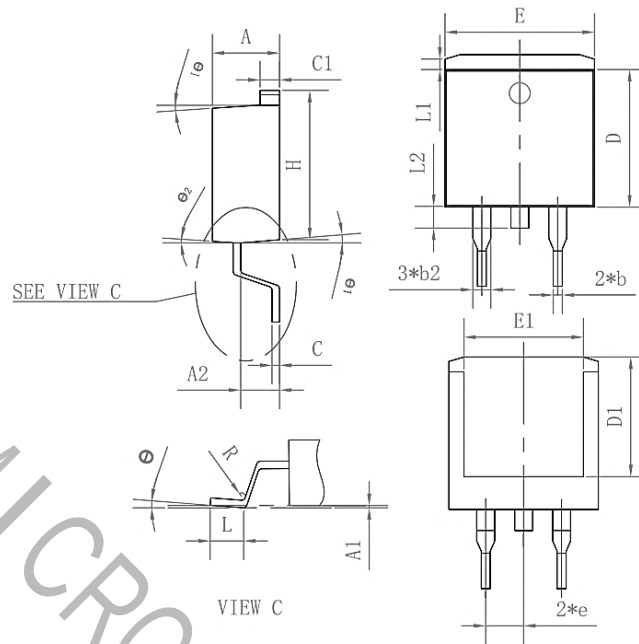
Figure.11: Safe Operating Area

Package Mechanical Data-TO-220-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
D	0.40	0.50	0.65
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	-	8.70	-
E2	9.63	10.00	10.35
E3	7.00	8.00	8.40
e		0.37	
e1		0.10	
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	-	3.10	3.40
Φp	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°
F	13.30	13.50	13.70
F1	15.50	15.90	16.30
F2	2.80	3.00	3.20

Package Mechanical Data-TO-263-3L



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°