

Features

- Low gate charge and improved dv/dt capacitance
- Multi-Epi Process
- Ultra-fast body diode
- Fast Recovery Body Diode
- Proprietary New Super-Junction Technology

Product Summary			
V _{DS}	R _{DS(on)} (mΩ) Typ	I _D (A)	Q _g (Typ)
650V	90 @ 10V 15A	30	65nc

Mechanical Data

- Case: TO-247, TO-3P Packag

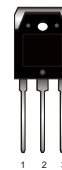
Application

- PFC stages for server & telecom
- EV Charger
- SMPS Standby Power
- UPS

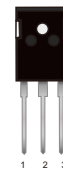
Ordering Information

Part No.	Package Type	Package	Quality(box)
SJ30N65PR	TO-247	Tube	360
SJ30N65KR	TO-3P	Tube	360

TO-3P
SJ30N65KR



TO-247
SJ30N65PR



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

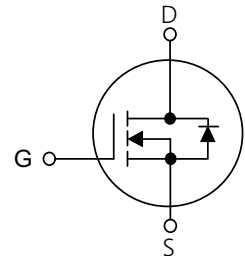


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter	Symbol	TO-247/TO-3P	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current	I _D	T _C =25°C 30	A
		T _C =100°C 21	
Pulsed Drain Current (Note 1)	I _{DM}	92	A
Single Pulse Avalanche Energy(Note 2)	E _{AS}	980	mJ
Avalanche Current(Note 1)	I _{AR}	9	A
Power Dissipation T _C =25°C	P _D	180	W
Operating Junction and Storage Temperature	T _J /T _{STG}	-55 ~ +150	°C

Table 2. Thermal Characteristics

Parameter	Symbol	TO-247/TO-3P	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C/W}$
Thermal resistance Junction to Case	$R_{\theta JC}$	0.69	$^{\circ}\text{C/W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V,I _D =250μA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =650V,V _{GS} =0V			6	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =30V,V _{DS} =0V			10	μA
	Reverse		V _{GS} =-30V,V _{DS} =0V			-10	μA
On Characteristics(Note 3)							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	3.0		5.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V,I _D =15A		90	100	mΩ
Dynamic Characteristics(Note 4)							
Input Capacitance		C _{ISS}	V _{DS} =25V,V _{GS} =0V,f=1MHz		3050		pF
Output Capacitance		C _{OSS}			108		pF
Reverse Transfer Capacitance		C _{RSS}			4		pF
Switching Characteristics (Note 4)							
Turn-On Delay Time		td(on)	V _{DD} =480V,V _{GS} =10V R _G =20Ω,I _D =15A		21		ns
Turn-On Rise Time		t _R			12		ns
Turn-Off Delay Time		td(off)			87		ns
Turn-Off Fall Time		t _f			15		ns
Total Gate Charge		Q _G	V _{DS} =480V,I _D =15A, V _{GS} =10V		65		nC
Gate-Source Charge		Q _{GS}			17		nC
Gate-Drain Charge		Q _{GD}			25		nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =15A			1.5	V
Maximum Continuous Drain-Source Diode Forward Current		I _S				30	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				102	A
Reverse Recovery Time		trr	V _{GS} =0V, I _S =15A		160		ns
Reverse Recovery Charge		Q _{RR}	dIF/dt=100A/μs (Note 1)		12		μC

Notes: 1 Limited by T_J , max. Maximum duty cycle $D=0.75$
2 Pulse width t_p limited by T_J , max
3 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
4 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

Figure 1. Output Characteristics

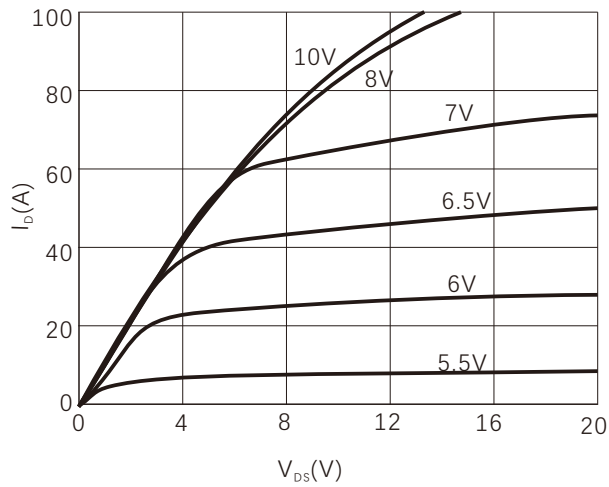


Figure 2. Transfer Characteristics

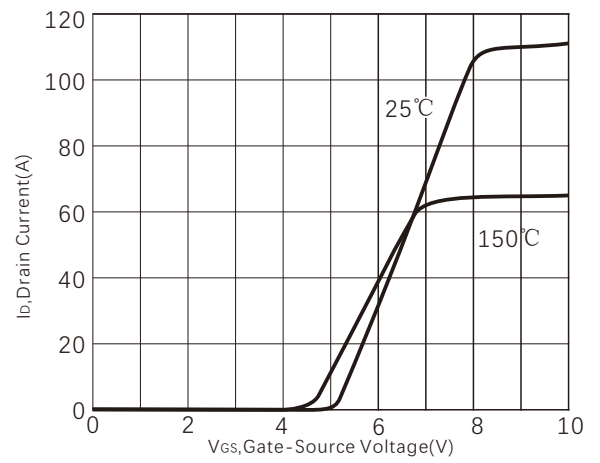


Figure 3. Source-Drain Diode Forward Voltage

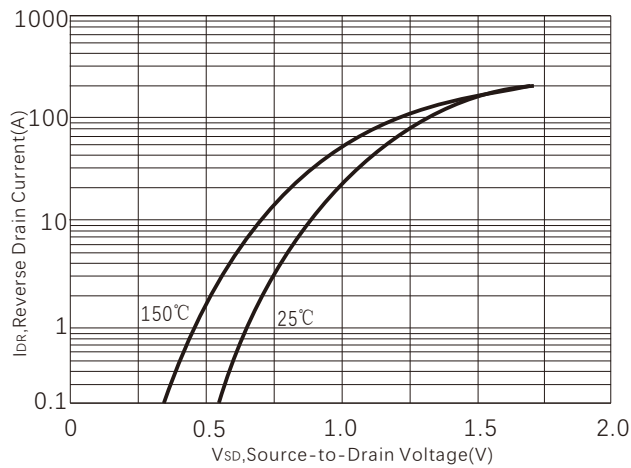


Figure 4. Capacitance

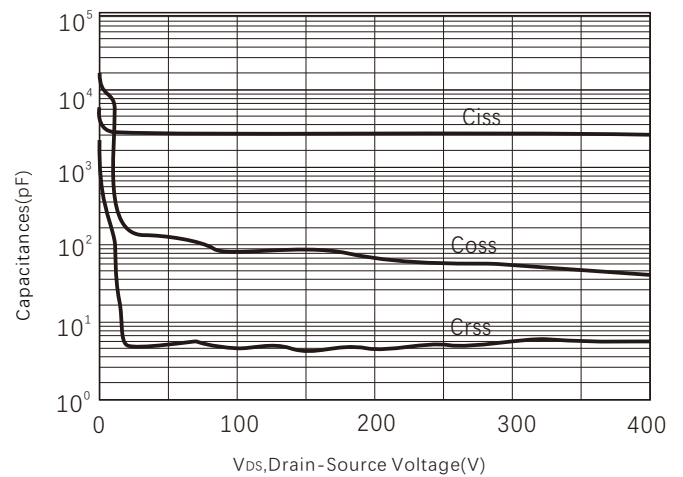


Figure 5. Gate charge

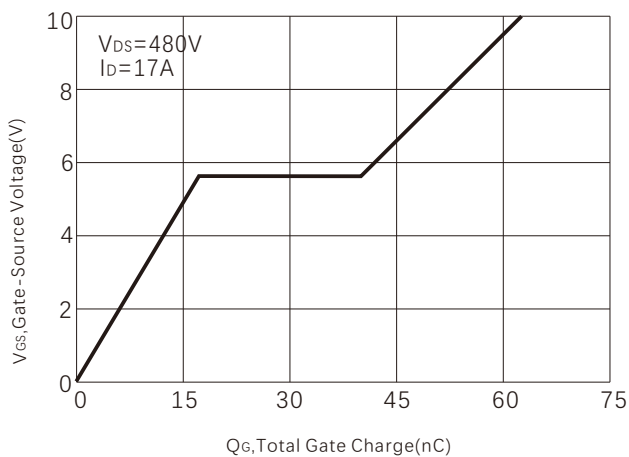


Figure 6. Normalized $R_{DS(ON)}$ vs Temperature

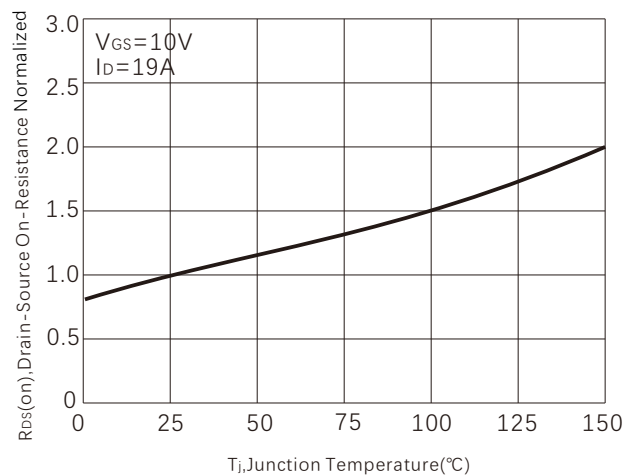


Figure 7. BV_{DSS} vs Junction Temperature

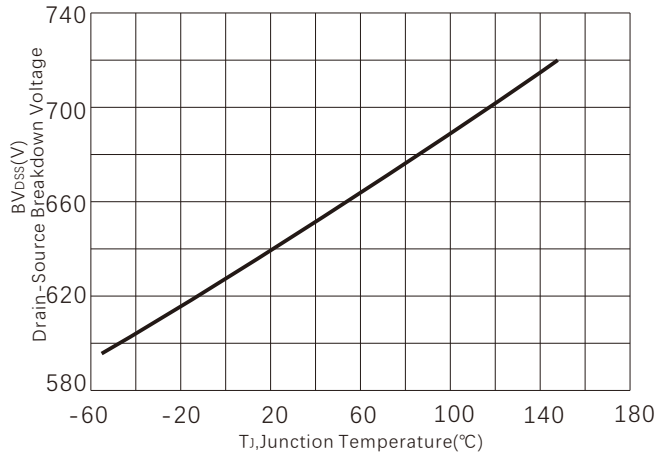


Figure 8. Maximum Drain Current vs Temperature

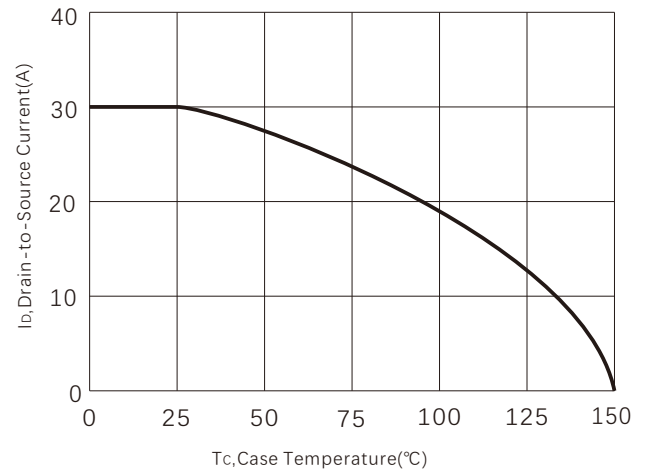


Figure 9. Safe operating area

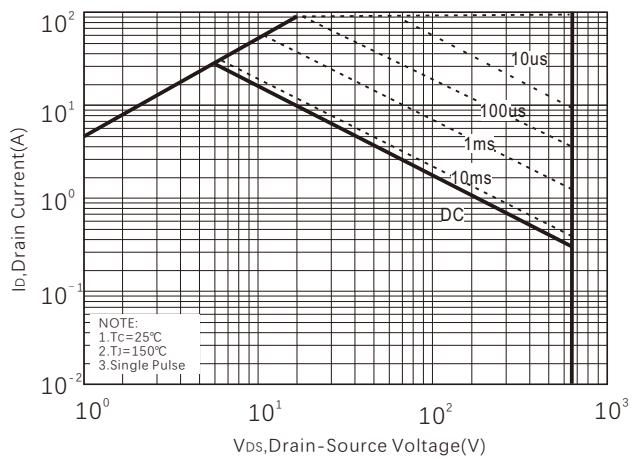


Figure 10. Power dissipation-TO-247

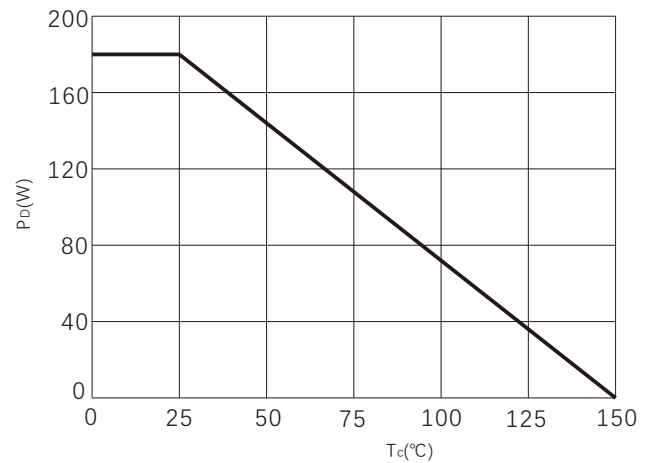
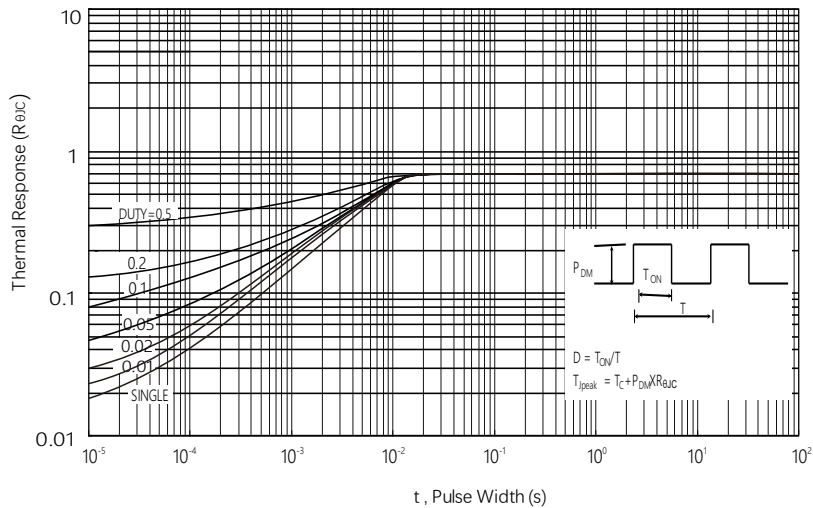
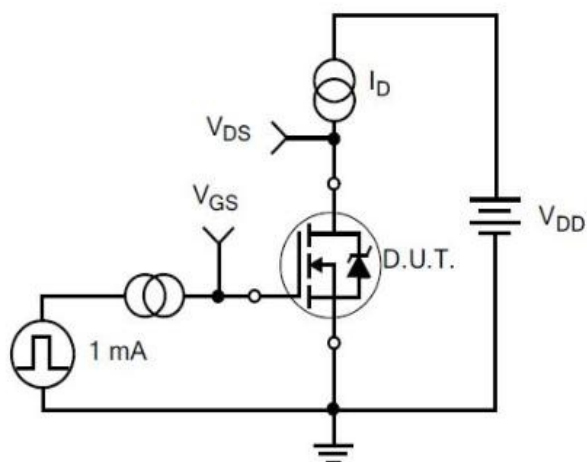


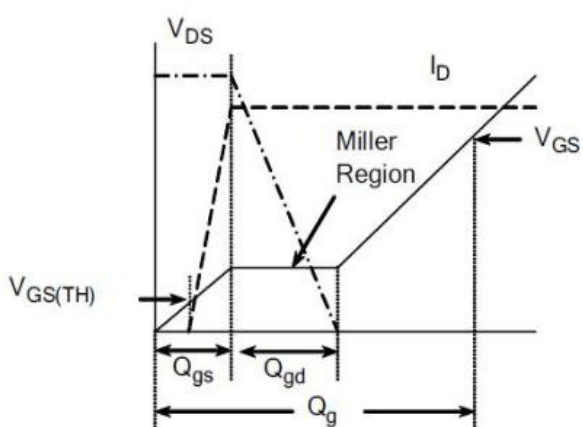
Figure 11. Maximum Transient Thermal Impedance



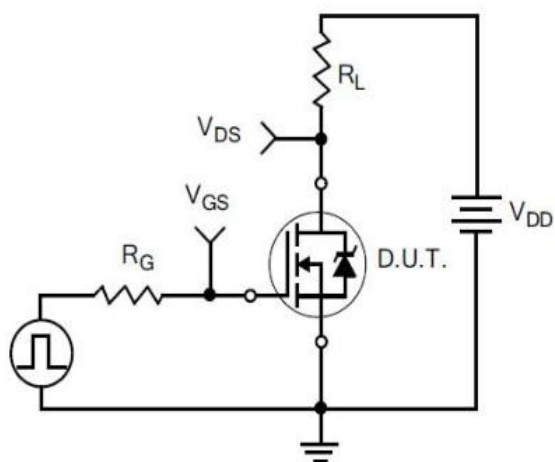
Typical Test Circuit



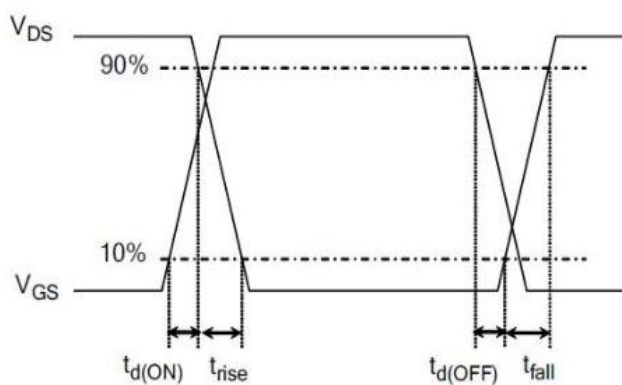
1) Gate Charge Test Circuit



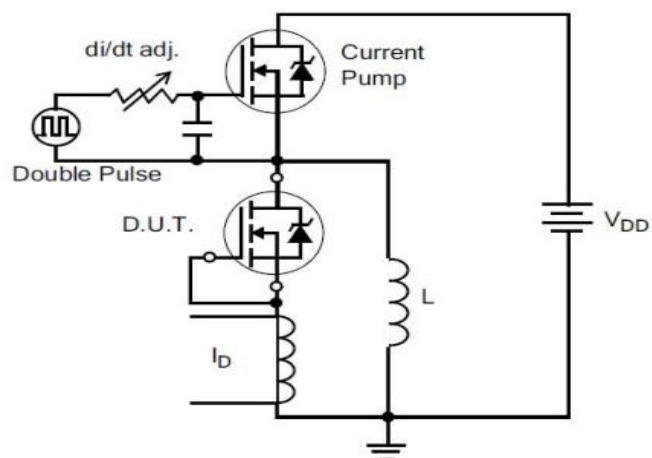
2) . Gate Charge Waveform



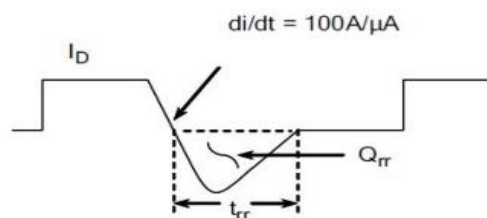
3) Resistive Switching Test Circuit



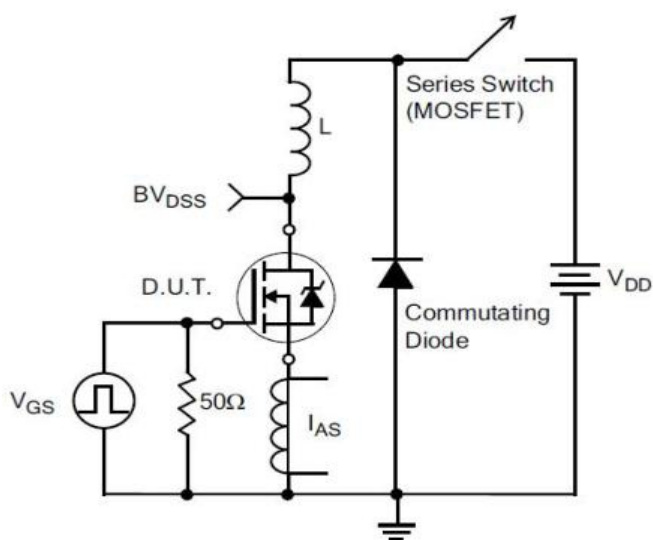
4) Resistive Switching Waveforms



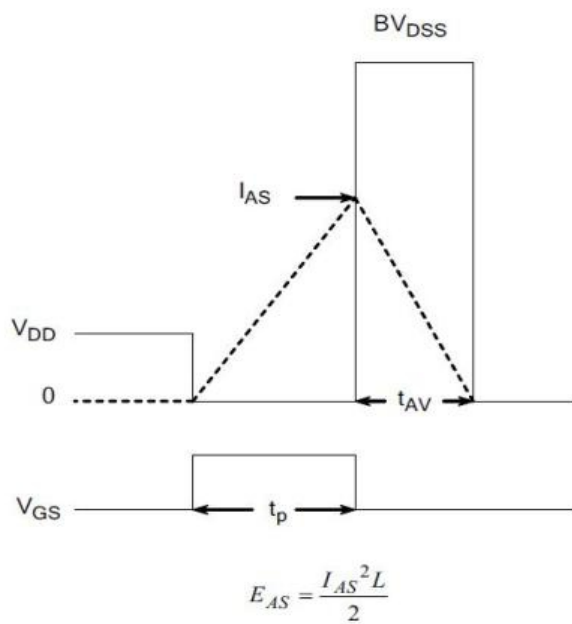
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

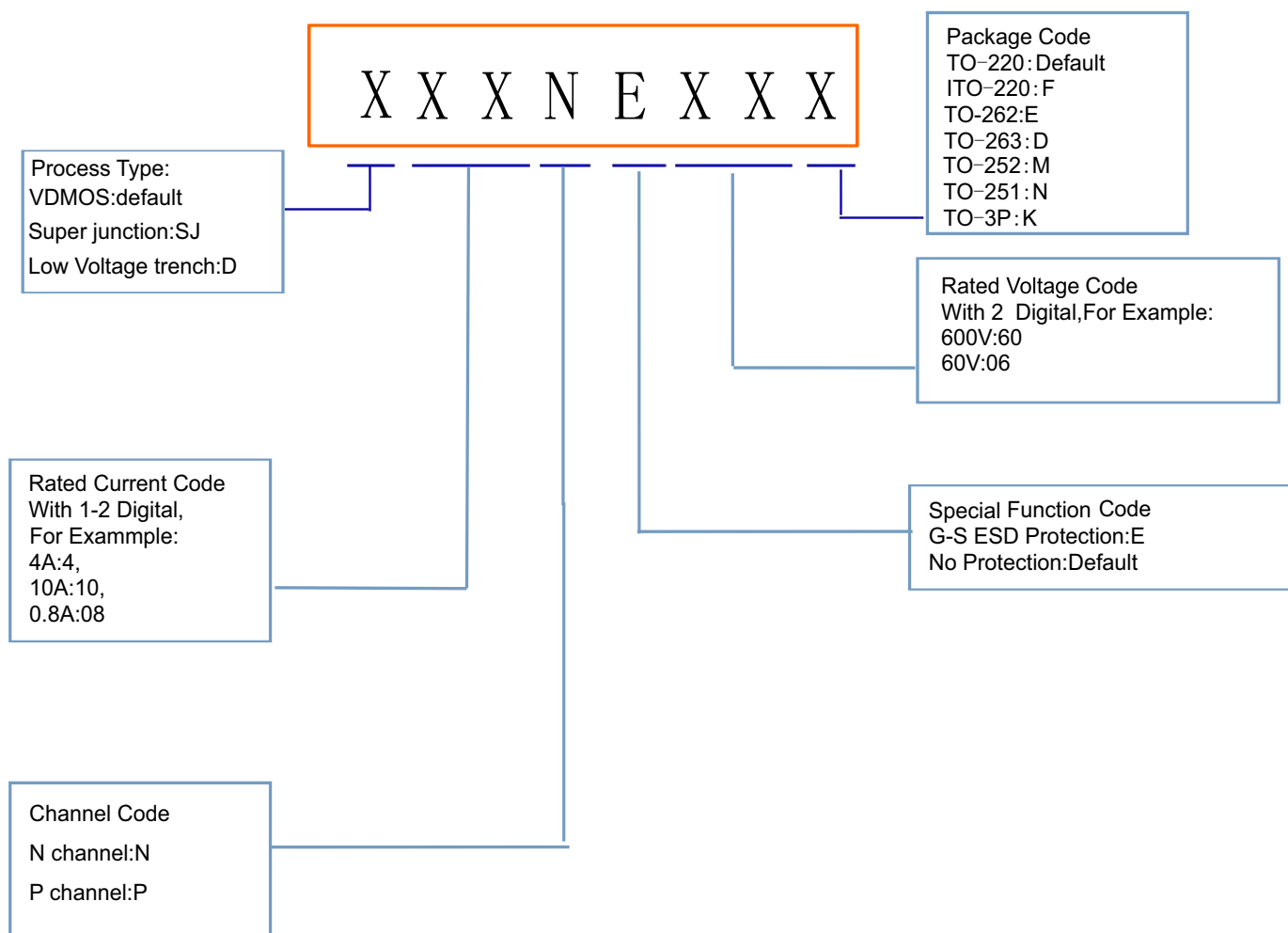


7) . Unclamped Inductive Switching Test Circuit



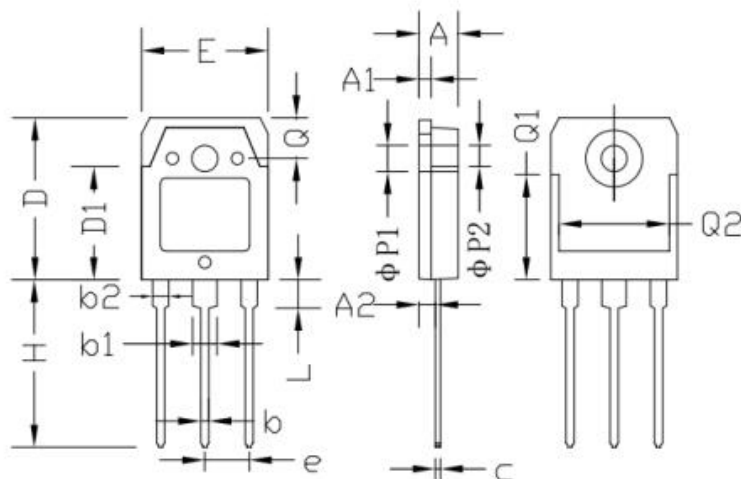
8) Unclamped Inductive Switching Waveforms

Product Names Rules



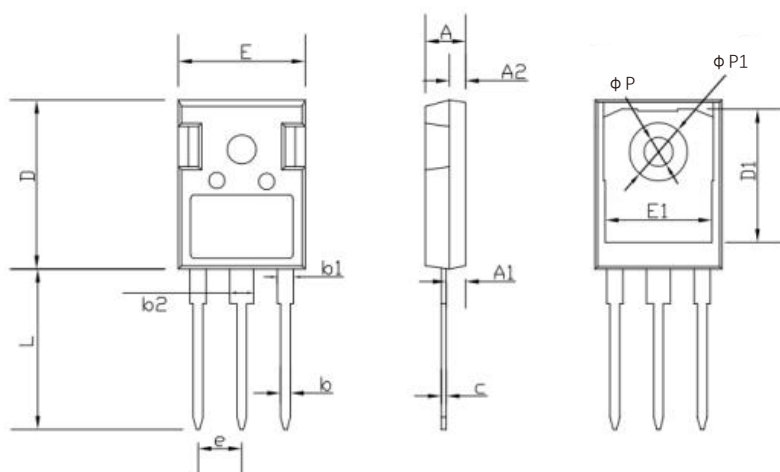
Dimensions

TO-3P PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	4.60	5.00	0.181	0.197
A1	1.45	1.65	0.057	0.065
A2	2.20	2.60	0.087	0.102
b	0.80	1.20	0.032	0.047
b1	2.80	3.20	0.110	0.126
b2	1.80	2.20	0.071	0.087
C	0.55	0.75	0.022	0.030
D	19.20	19.70	0.756	0.776
D1	13.10	14.70	0.516	0.578
E	15.40	15.80	0.607	0.623
e	5.45	TYP	0.215	TYP
H	19.80	20.20	0.780	0.826
L	3.30	3.70	0.130	0.146
ΦP1	3.20	TYP	0.126	TYP
ΦP2	3.50	TYP	0.138	TYP
Q	5.00	TYP	0.197	TYP
Q1	12.40	TYP	0.488	TYP
Q2	12.6	-	0.496	-

TO-247 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.90	2.10	0.075	0.083
b	1.16	1.26	0.046	0.050
b1	1.96	2.06	0.0772	0.0812
b2	2.96	3.06	0.117	0.121
c	0.59	0.66	0.0232	0.0260
D	20.90	21.10	0.8235	0.8313
D1	16.25	16.85	0.6403	0.6639
E	15.70	15.90	0.6186	0.6265
E1	13.10	13.50	0.5161	0.5319
e	5.44		0.2143	
L	19.80	20.10	0.7801	0.7919
ΦP	3.50	3.70	0.1379	0.1458
ΦP1	0	7.30	0	0.2876

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