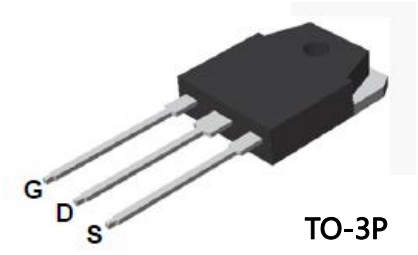
200V N-Channel MOSFET

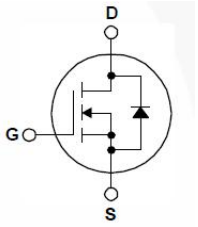
Features

- V_{DSS}=200V I_D=90A
  $R_{DS(ON)}$=18mΩ(Typ.)@V_{GS}=10V
- Low On-Resistance
- Improved dv/dt capability
- Super Low Gate Charge
- 100% EAS Guaranteed
- Fast switching speed

PIN DESCRIPTION



TO-3P



Applications

- High frequency switching mode power supply
- Uninterruptible Power Supply
- Power Factor Correction

Part Number	Package	Marking	ROHS Status	Packing
SI200N06P	TO-3P	SI200N06P	Pd-Free	Box(Tube)

Absolute Maximum Ratings (Tc=25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-Source Voltage		200	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	Tc=25℃	90	A
I_{DM}	Pulsed Drain Current		360	A
E_{AS}	Single Pulse Avalanche Energy		2113	mJ
I_{AS}	Avalanche Current		54	A
E_{AR}	Repetitive Avalanche Energy		1268	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55 to 150	°C
P_D	Total Power Dissipation	Tc=25°C	580	W

THERMAL RESISTANCE RATINGS

Symbol	Paramete	Typical	Max	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient	-	40	℃/W
$R_{\theta JC}$	Maximum Junction-to-Case	-	0.26	

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	TYP.	Max.	Unit
Static Characteristics						
$V_{(BRV)DSS}$	Drain-source breakdown voltage	V_{GS}=0V,I_D= 250uA	200	-	-	V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS},I_D=250uA	2	-	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=200V,V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-source leakage current	V_{DS}=0V,V_{GS}=±20V	-	-	±100	nA
$R_{DS(on)}$	Drain-source on-state resistance	V_{GS}=10V,I_D=45A	-	18	-	mΩ
Dynamic Characteristic						
Qg	Total Gate Charge	V_{GS}=10V,V_{DD}=100V I_D=45A	-	400	-	nC
Qgs	Gate-Source Charge		-	25	-	nC
Qgd	Gate-Drain Charge		-	240	-	nC
$T_{d(on)}$	Turn-on delay time	I_D=45A,V_{DD}=100V, R_G=1.2Ω,V_{GS}=10V	-	75	-	nS
T_r	Rise time		-	325	-	nS
$T_{d(off)}$	Turn-off delay time		-	1500	-	nS
T_f	Fall time		-	480	-	nS
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V f=1.0MHz	-	5700	-	pF
C_{oss}	Output Capacitance		-	1005	-	pF
C_{rss}	Reverse Transfer Capacitance		-	445	-	pF
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=45A	-	-	1.4	V
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
Trr	Reverse Recovery Time	V_{GS}=0V,I_F=45A, diF/dt=100A /μs	-	250	-	ns
Qrr	Reverse Recovery Charge		-	275	-	uC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2% .
3. L=1mH, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25 ºC .

Typical Characteristics (TJ = 25ºC, unless otherwise noted)

Figure 1. Output Characteristics (T_J = 25ºC)

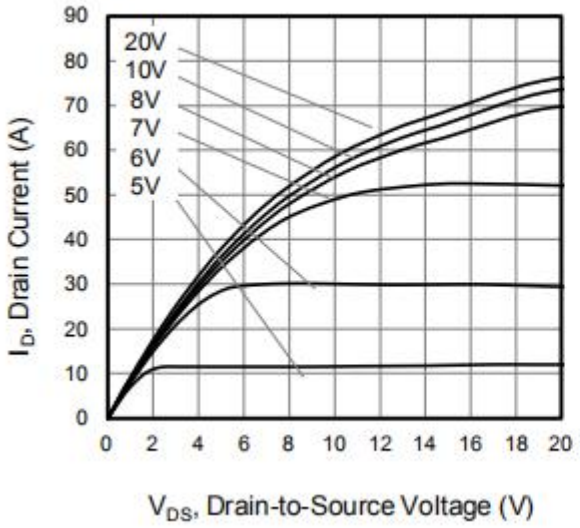


Figure 2. Body Diode Forward Voltage

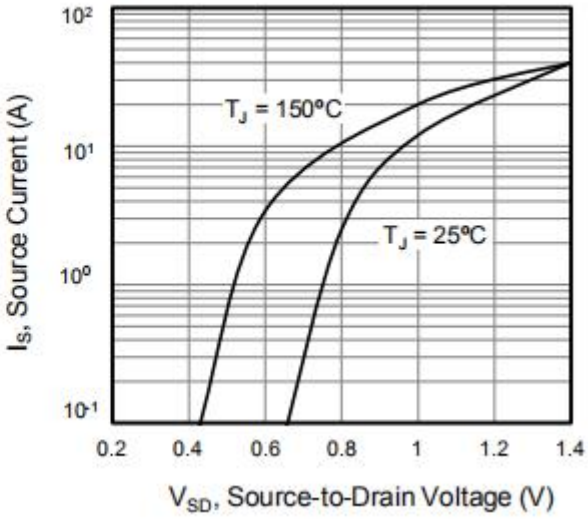


Figure 3. Drain Current vs. Temperature

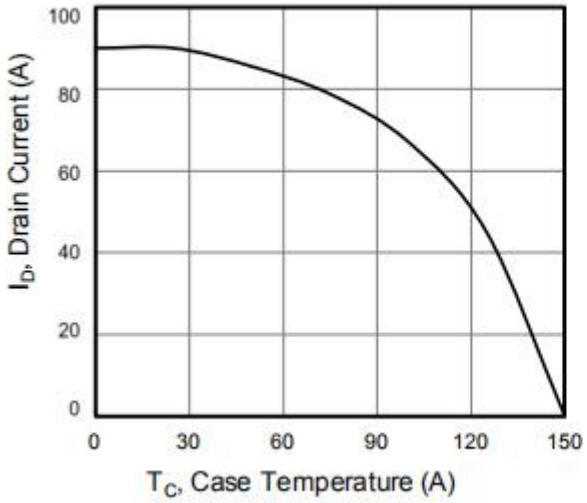


Figure 4. BV_{DSS} Variation vs. Temperature

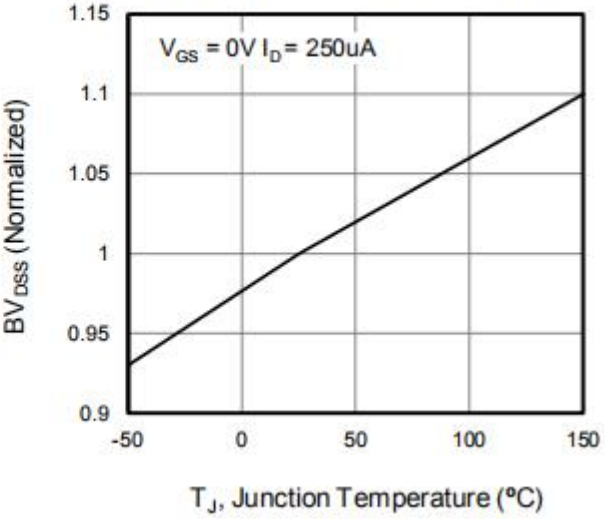


Figure 5. Transfer Characteristics

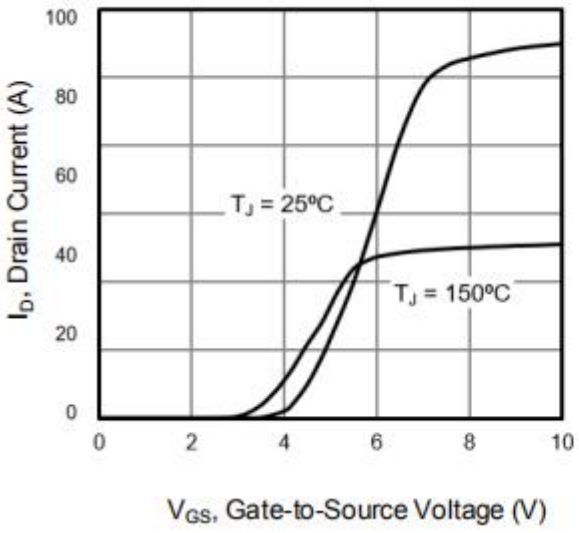
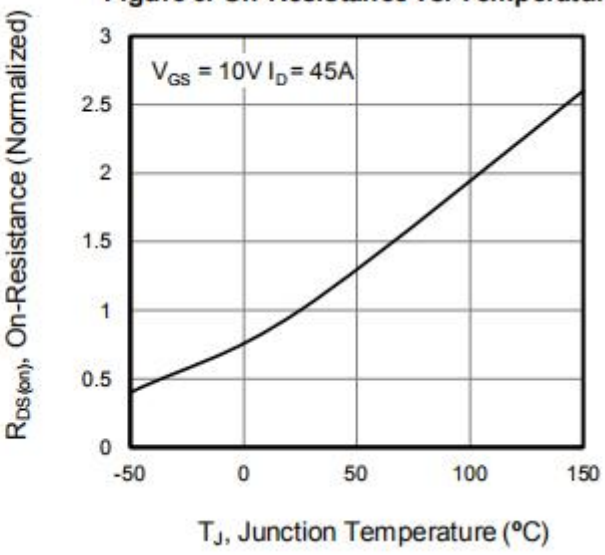


Figure 6. On-Resistance vs. Temperature



Switching Time Test Circuit and Wave forms

Figure A: Gate Charge Test Circuit and Waveform

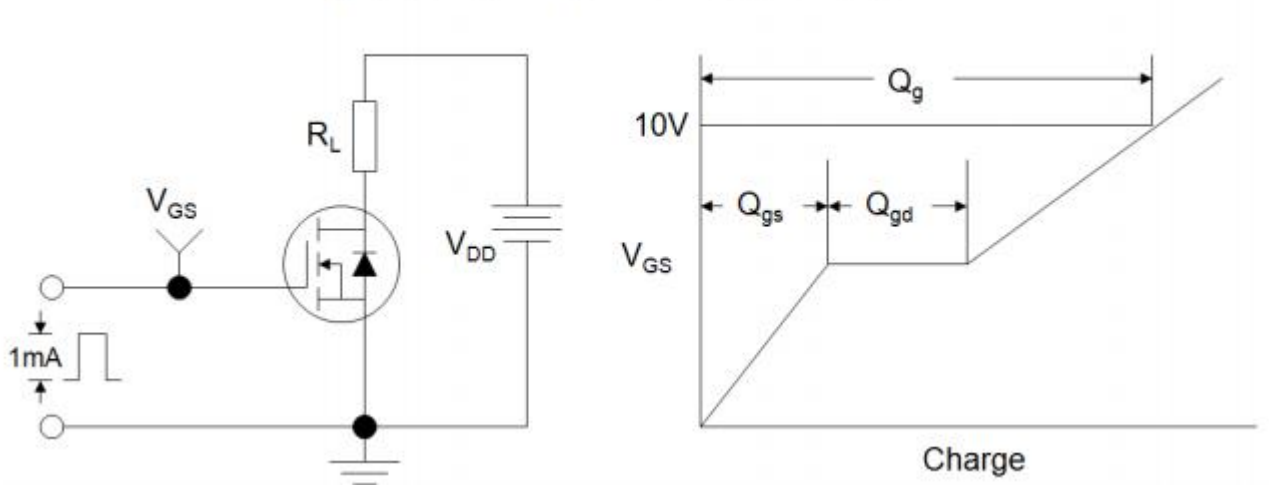


Figure B: Resistive Switching Test Circuit and Waveform

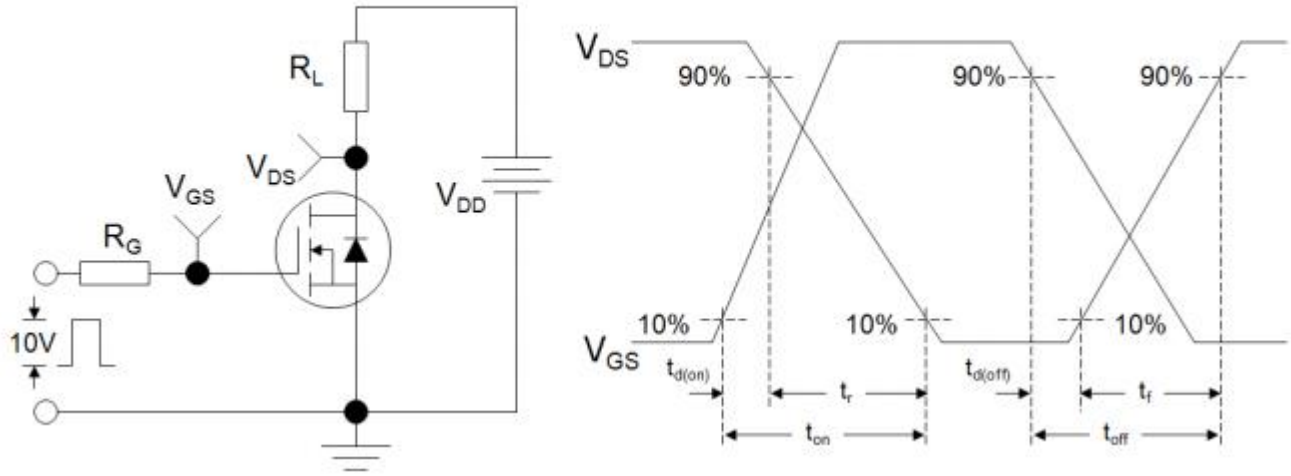
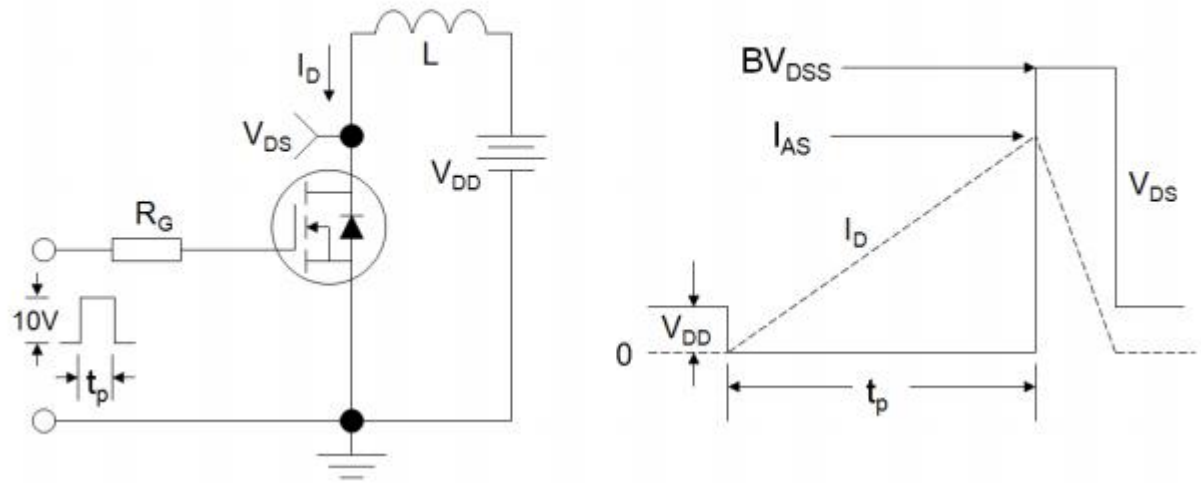


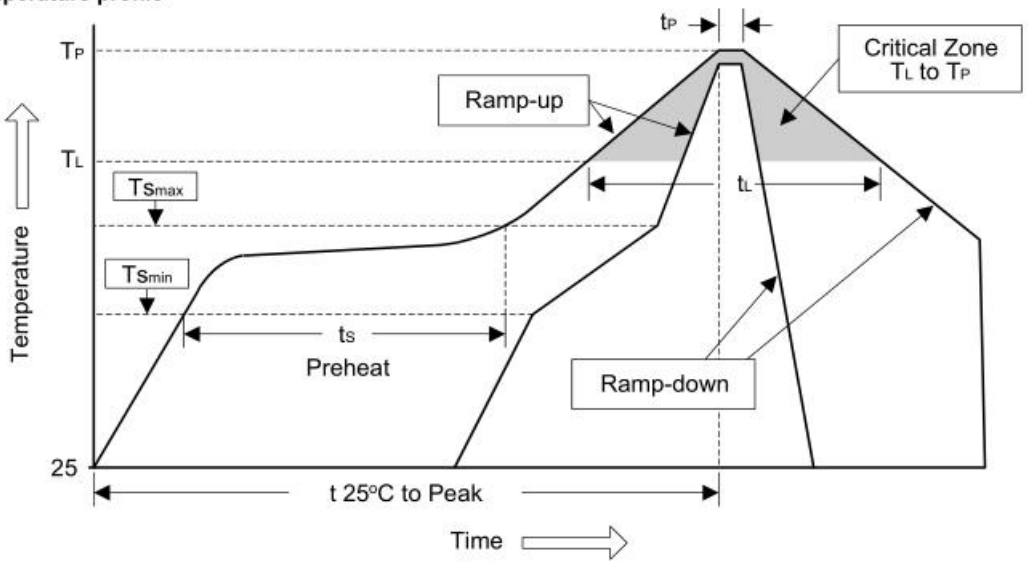
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Soldering Methods for Products

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate(TL to TP)	<3℃/sec	<3℃/sec
Preheat -Temperature Min(Ts min) -Temperature Max(Ts max) -Time(min to max)(ts)	- 100℃ 150℃ 60 to 120 sec	- 150℃ 200℃ 60 to 180 sec
Ts max to TL - ramp-up rate	<3℃/sec	<3℃/sec
Time maintained above: -Temperature(TL) -Time(TL)	183℃ 60 to 150 sec	217℃ 60 to 150 sec
Peak Temperature(TP)	240℃+0/-5℃	250℃+0/-5℃
Time within 5℃ of actual Peak Temperature	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6℃/sec	<6℃/sec
Time 25 ℃ to Peak Temperature	<6 minutes	<8 minutes

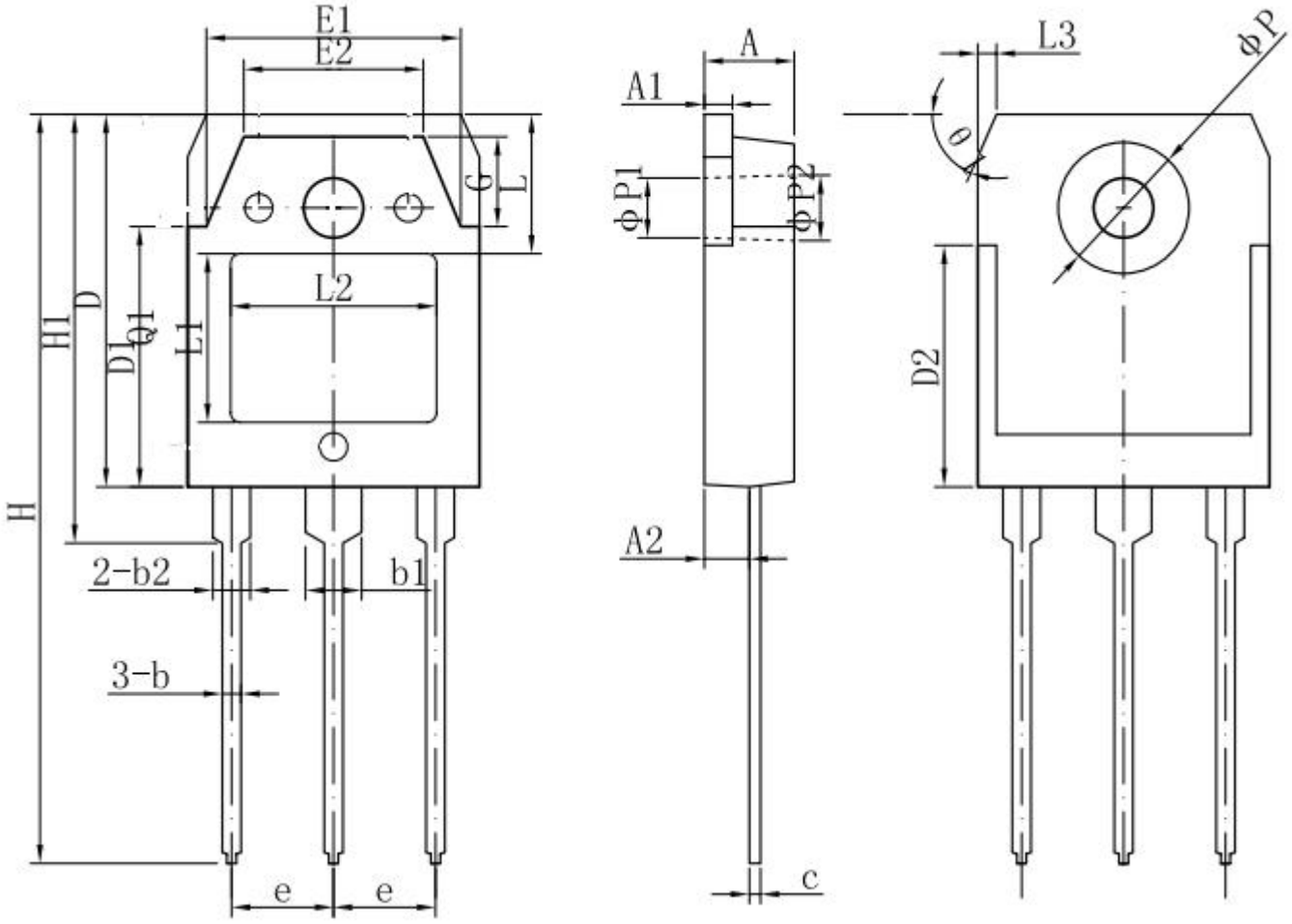
Figure 1: Temperature profile



Note : 1.Storage environment: Temperature=10℃ to 35@Humidity=45%±15%
2.Reflow soldering of surface-mount devices
3.Flow(wave) soldering(solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices	245℃±5℃	5sec±1sec
Pb-free devices	250℃+0/-5℃	5sec±1sec

Package Outline



unit：mm					
Symbol	**Min**	**Max**	**Symbol**	**Min**	**Max**
A	4.60	5.00	**E1**	13.6Typ.	
A1	1.40	1.60	**E2**	9.6Typ.	
A2	2.30	2.50	**e**	5.45Typ.	
b	0.80	1.20	**G**	4.8Typ.	
b1	2.90	3.25	**H**	39.5	40.5
b2	1.90	2.25	**H1**	22.9Typ.	
C	0.50	0.75	**L**	7.4Typ.	
D	19.7	20.1	**L1**	9.0Typ.	
D1	13.9Typ.		**L2**	11.0Typ.	
D2	12.9REF		**L3**	1.00REF.	

Important Notice

Si-Trend reserves the right to change all product、product specifications and data without prior notice；Our customer Please confirm to place an order confirmation before make the integrity of information complete and up-to-date。

Any semiconductor under specific conditions are possible to certain failure or malfunction rate；Customers are responsible in the use of Si-Trend products to system design and manufacturing in compliance with safety standards and adopting safety measures，To avoid the potential risk of failure may cause the personal safety and property loss。

Si-Trend Always refine on to provide more excellent products

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