

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	13mΩ@10V	55A
	16mΩ@4.5V	



合肥矽普半导体

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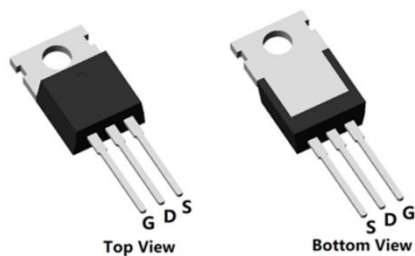
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

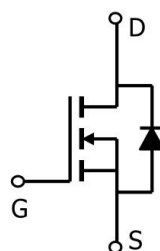
- Power switching application
- Battery management
- Uninterruptible power supply

Package

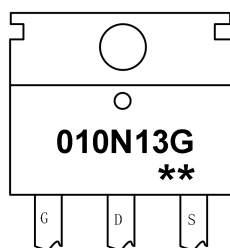


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



010N13G : Product code
****** : Week code

Order Information

Device	Package	Unit/Tube
SP010N13GTQ	TO-220-3L	50

Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	55	A
Continuous Drain Current (Tc=100°C)	I_D	37	A
Pulsed Drain Current	I_{DM}	220	A
Single Pulse Avalanche Energy ¹	E_{AS}	144	mJ
Power Dissipation (Tc=25°C)	P_D	87	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.44	°C/W
Storage Temperature Range	T_{STG}	55 to 150	°C
Operating Junction Temperature Range	T_J	55 to 150	°C

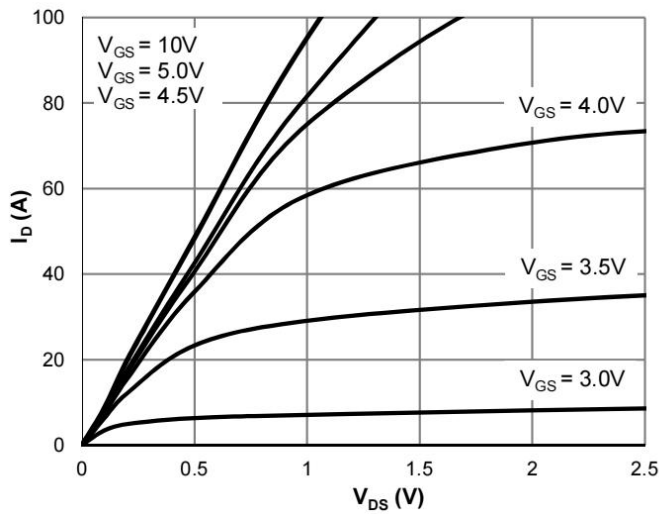
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	100	-	-	V
Drain Cut-Off Current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.8	2.5	V
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A	-	13	17	mΩ
		V _{GS} = 4.5V, I _D = 10A	-	16	21	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} = 0V, f = 1.0MHz	-	1225	-	pF
Output Capacitance	C _{oss}		-	379	-	
Reverse Transfer Capacitance	C _{rss}		-	17	-	
Total Gate Charge	Q _g	V _{DS} =50V , V _{GS} =10V , I _D =20A	-	14	-	nC
Gate-Source Charge	Q _{gs}		-	5	-	
Gate-Drain Charge	Q _{gd}		-	2.7	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} =50V, I _D =20A R _G = 2.2Ω	-	38	-	nS
Rise Time	t _r		-	12	-	
Turn-Off Delay Time	t _{d(off)}		-	51	-	
Fall Time	t _f		-	17	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =1A , T _J =25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	55	A
Reverse Recovery Time	T _{rr}	I _S =20A, di/dt=100A/us, T _J =25℃	-	40	-	nS
Reverse Recovery Charge	Q _{rr}		-	42	-	nC

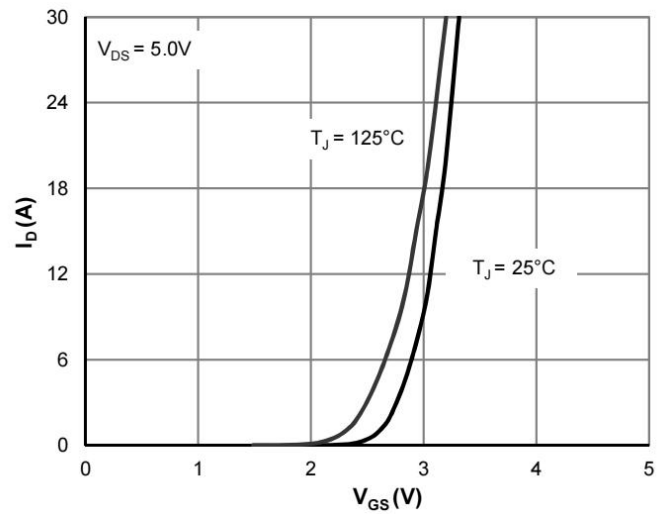
Note:

- The EAS test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$

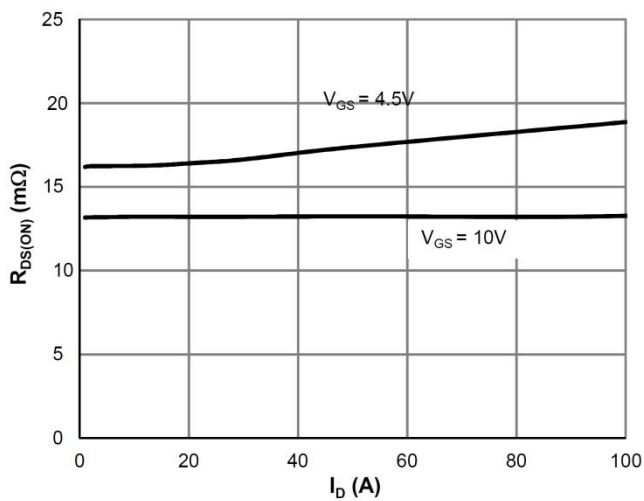
Typical Characteristics



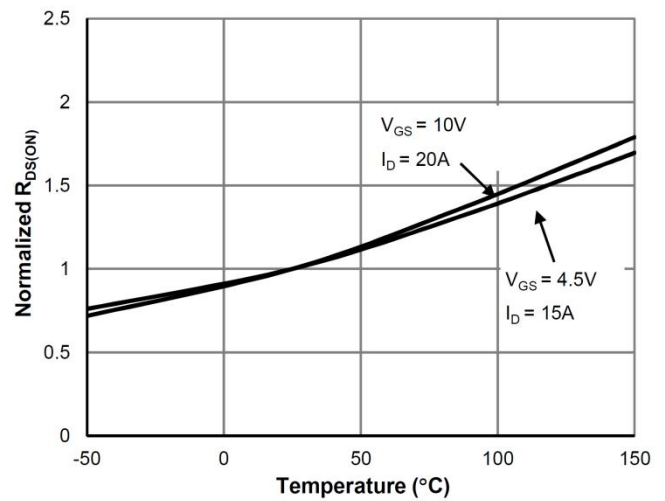
Typical Output Characteristics



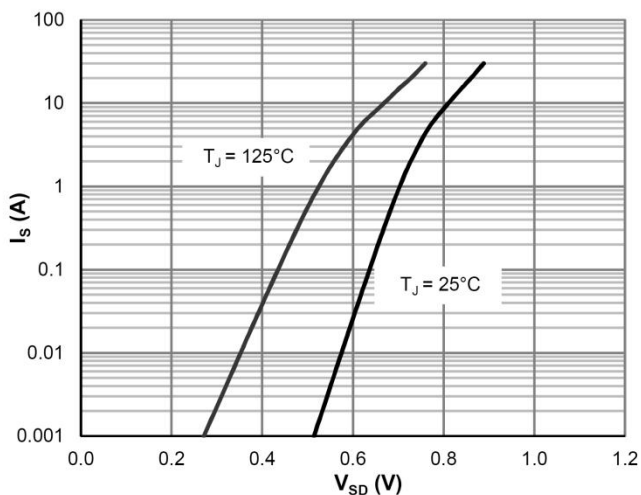
Transfer Characteristics



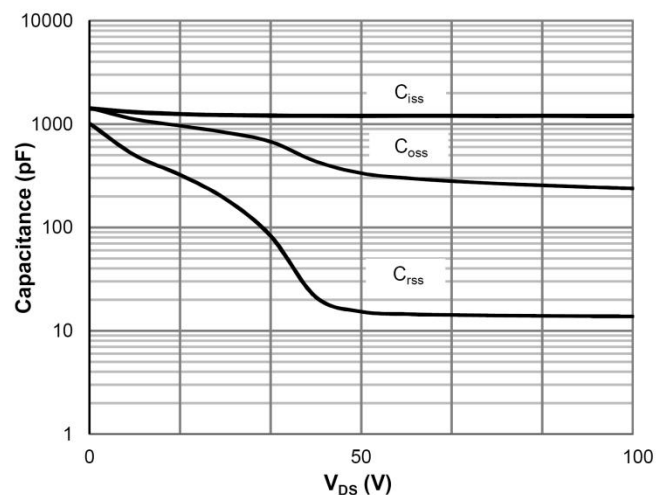
On-Resistance vs. Drain Current



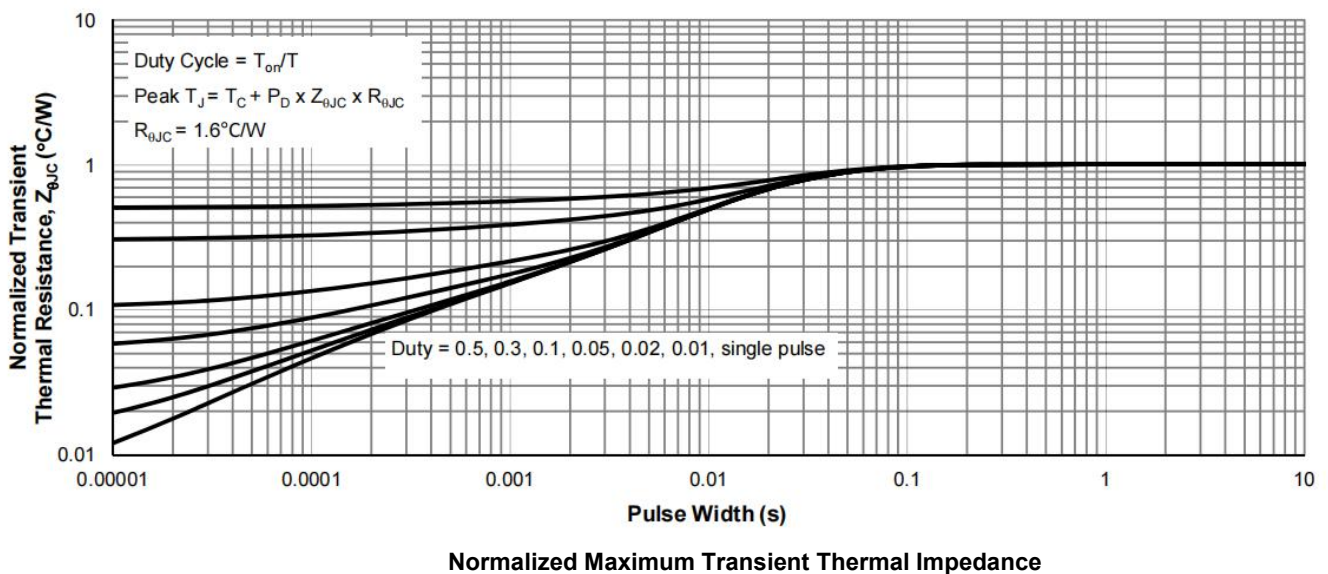
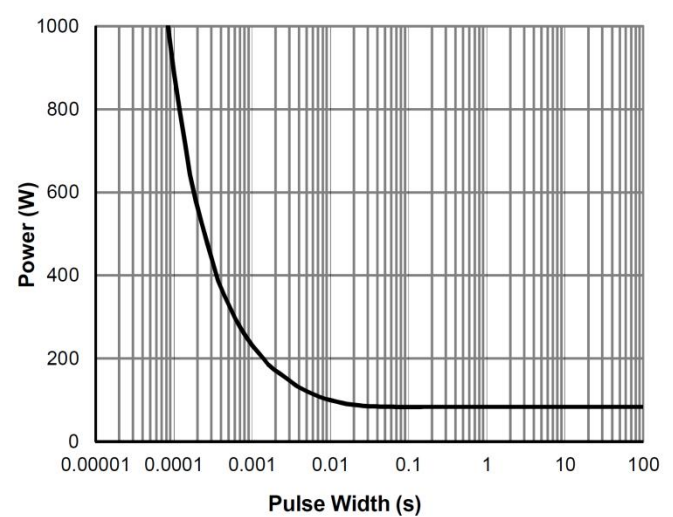
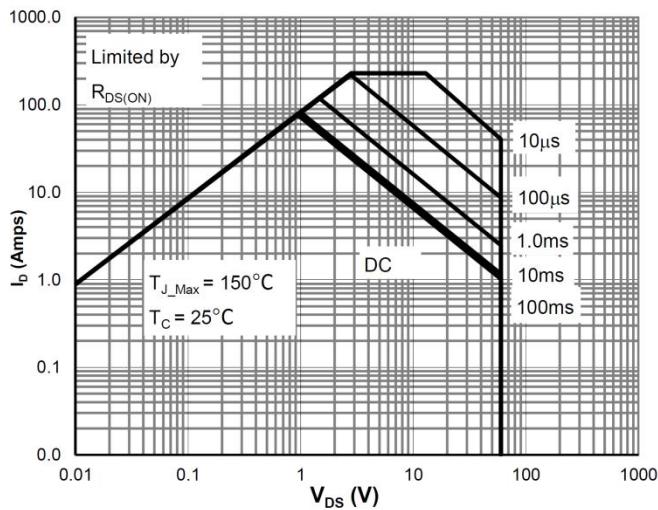
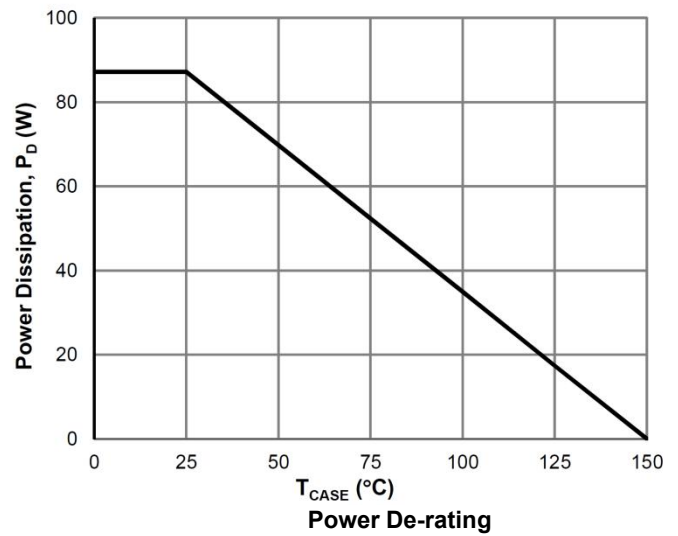
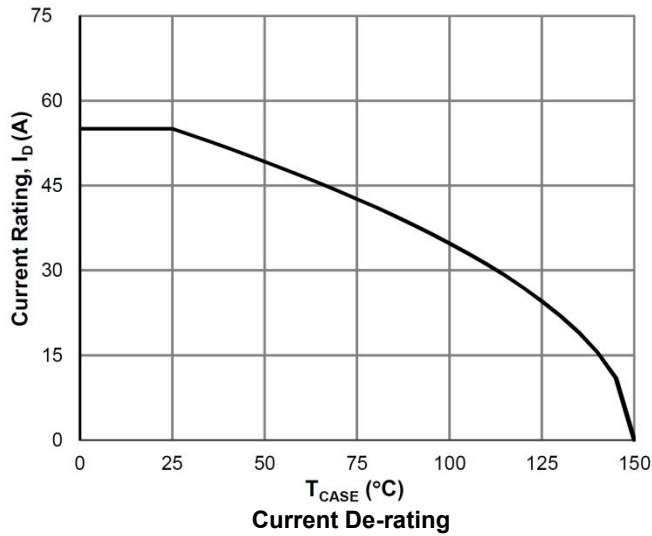
On-Resistance vs. Junction Temperature



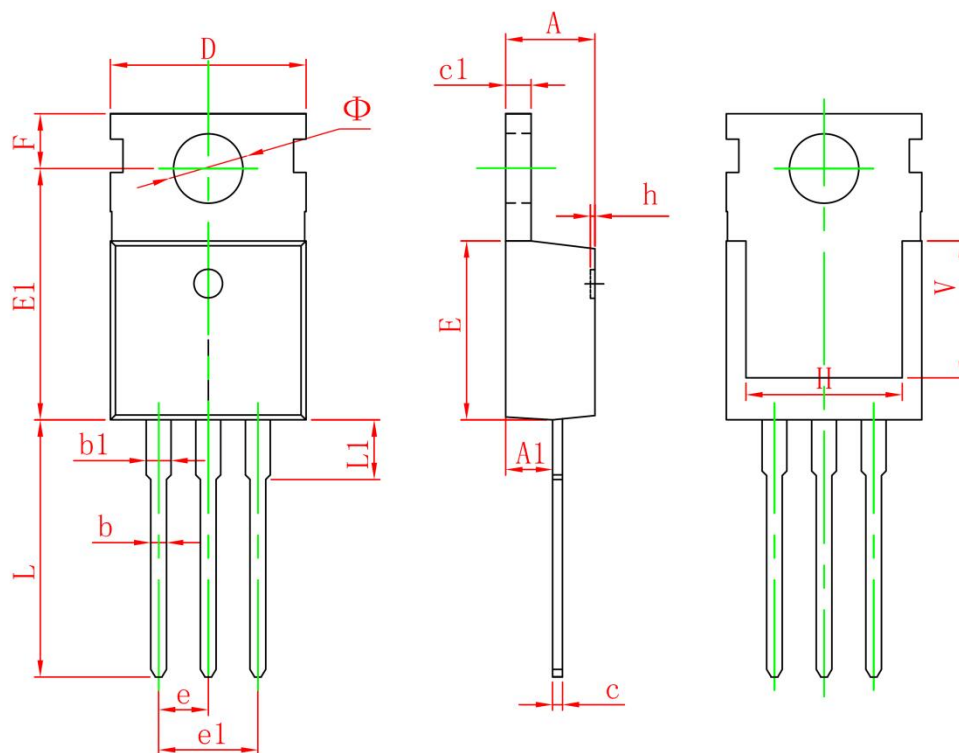
Body-Diode Characteristics



Capacitance Characteristics



TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150