Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
150V	13mΩ@10V	55A

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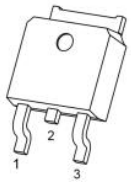
Feature

- Low RDS(on) & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

Applications

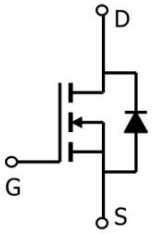
- Consumer electronic power supply
- Motor control Synchronous rectification
- Isolated DC/DC convertor
- Inventors

Package

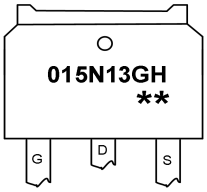


TO-252(1:G 2:D 3:S)

Circuit diagram



Marking



015N13GH : Product code
* : Month code

Order Information

Device	Package	Unite/Tape
SP015N13GHTH	SOT-23	2500

Absolute maximum ratings (Ta=25℃ unless otherwise noted)

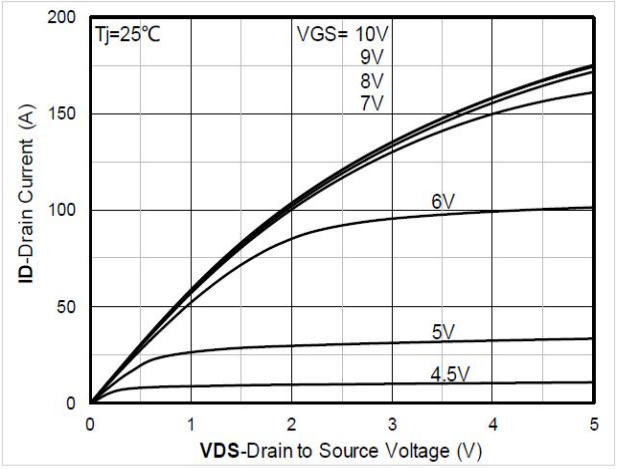
Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	150	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1], TC=25 ℃	I_D	55	A
Pulsed drain current[2], TC=25 ℃	I_{DM}	220	A
Power dissipation[3], TC=25 ℃	P_D	142	W
Single pulsed avalanche energy[4]	E_{AS}	424	mJ
Thermal resistance, junction-case	$R_{\theta JC}$	0.88	℃/W
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃

Electrical characteristics (Ta=25℃, unless otherwise noted)

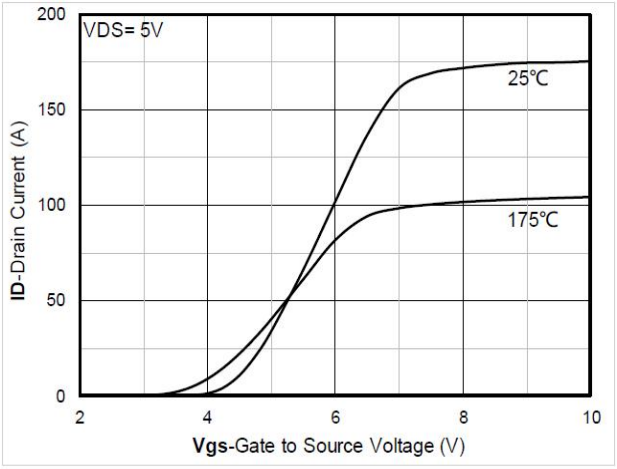
Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	VGS=0 V, ID=250 μA	150			V
Drain-source leakage current	I_{DSS}	VDS=150 V, VGS=0 V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20 V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	VDS=VGS, ID=250 μA	2	3	4	V
Drain-source on-state resistance	$R_{DS(ON)}$	VGS=10 V, ID=20 A		13	16	mΩ
Dynamic Characteristics						
Input capacitance	C_{iss}	VGS=0 V, VDS=75 V, f=1 MHz		2230		pF
Output capacitance	C_{oss}			293		pF
Reverse transfer capacitance	C_{rss}			22		pF
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	VGS=10 V, VDS=75 V, RG=2.5Ω, ID=2 A		16		ns
Rise time	t_r			42		ns
Turn-off delay time	$t_{d(off)}$			24		ns
Fall time	t_f			4.8		ns
Total gate charge	Q_g	ID=30 A, VDS=75 V, VGS=10 V		37		nC
Gate-source charge	Q_{gs}			10.2		nC
Gate-drain charge	Q_{gd}			16.8		nC
Drain-Source Diode Characteristics						
Diode forward voltage	V_{SD}	IS=1 A, VGS=0 V			1.2	V
Reverse recovery time	t_{rr}	IS=12 A,di/dt=100 A/μs		89		ns
Reverse recovery charge	Q_{rr}			279		nC
Peak reverse recovery current	I_{rrm}			6.4		A

Notes:
1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) VDD=50 V,VG=10V, RG=25Ω, L=0.5 mH, starting Tj=25 °C.

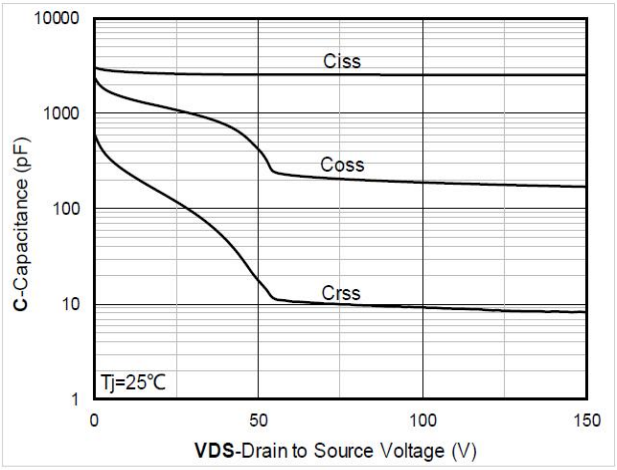
Typical Characteristics



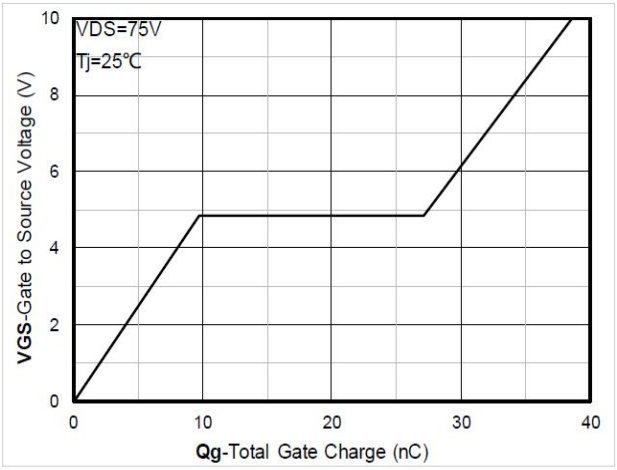
Output Characteristics



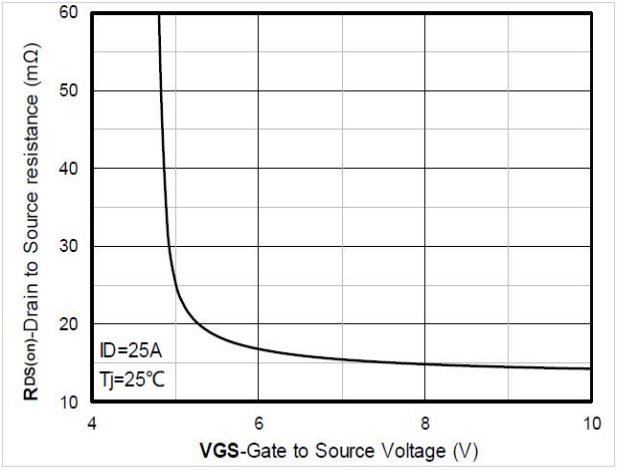
Transfer Characteristics



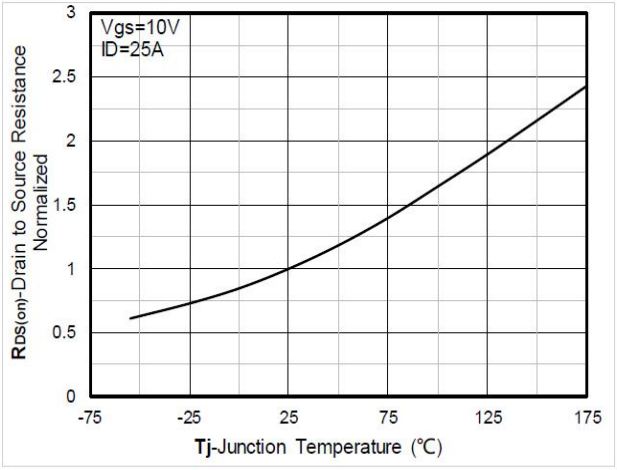
Capacitance Characteristics



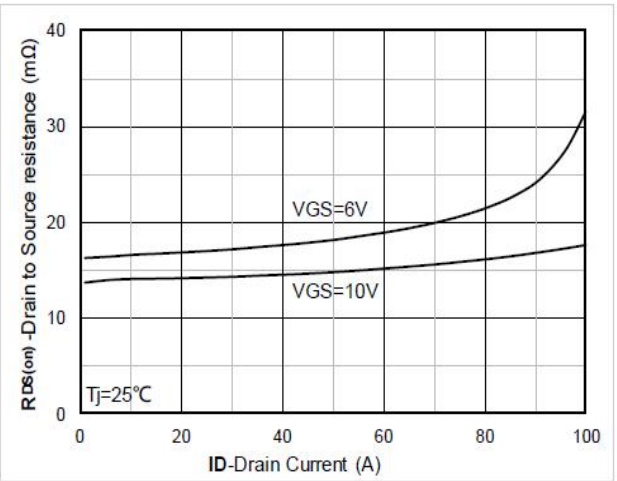
Gate Charge



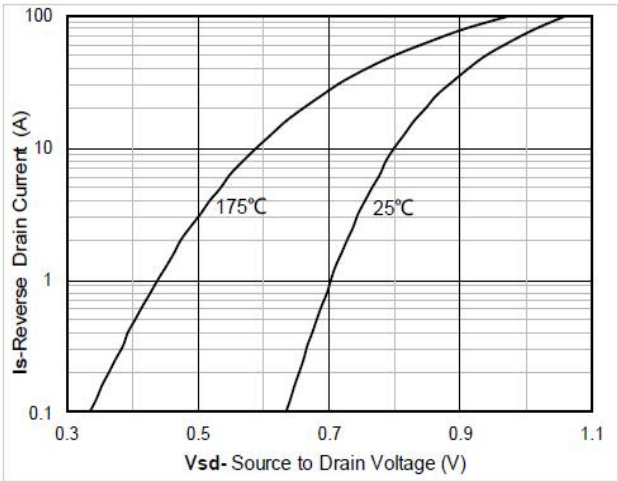
On-Resistance vs Gate to Source Voltage



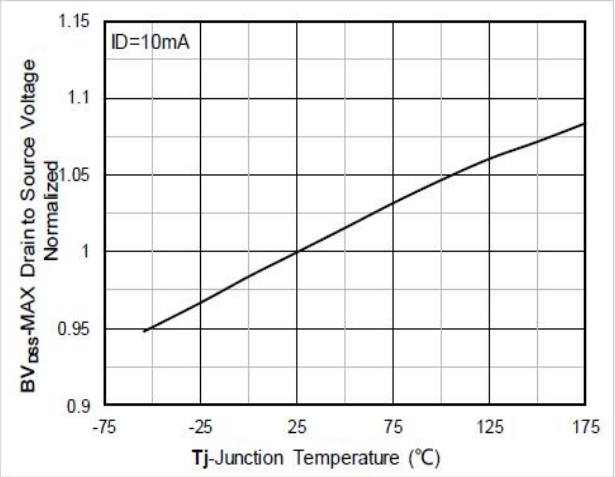
Normalized On-Resistance



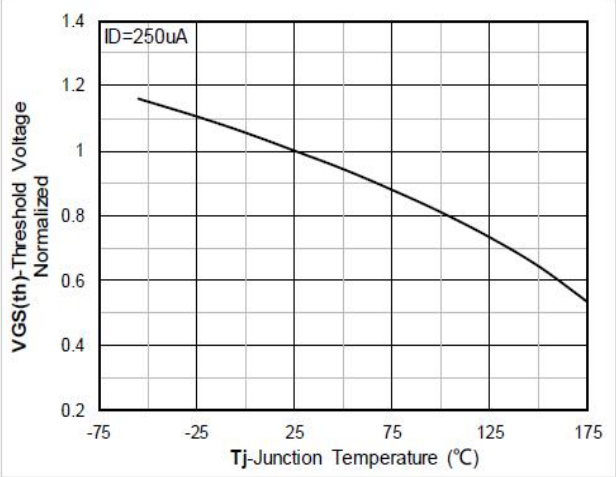
$R_{DS(on)}$ VS Drain Current



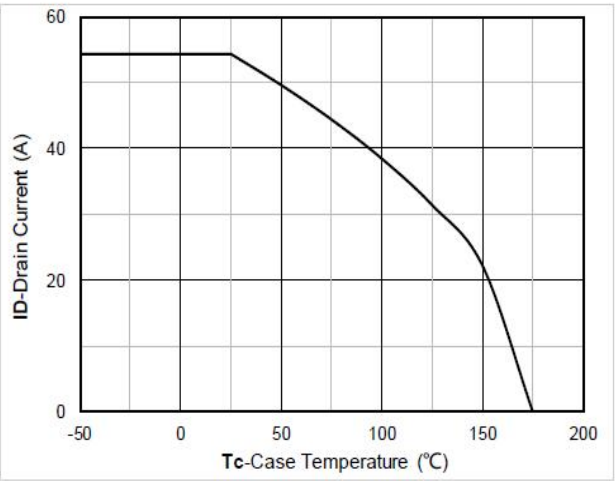
Forward characteristics of reverse diode



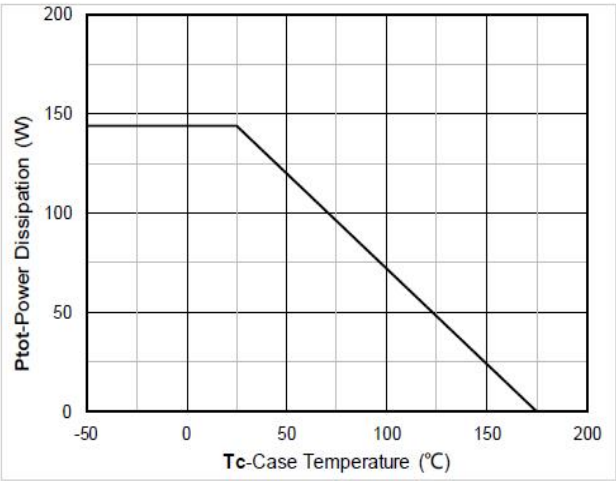
Normalized breakdown voltage



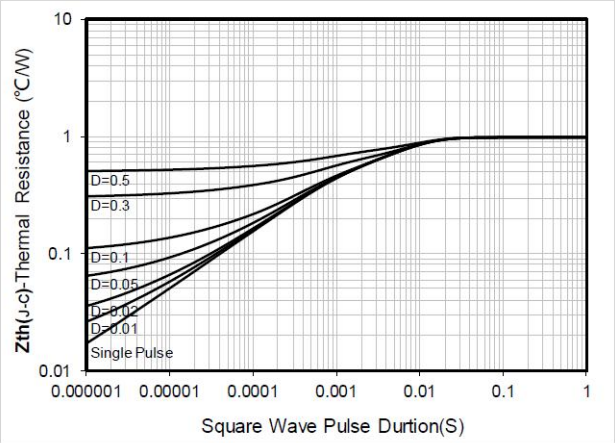
Normalized Threshold voltage



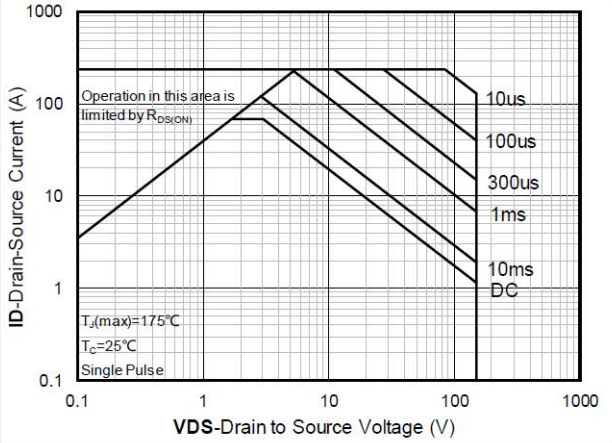
Current dissipation



Power dissipation

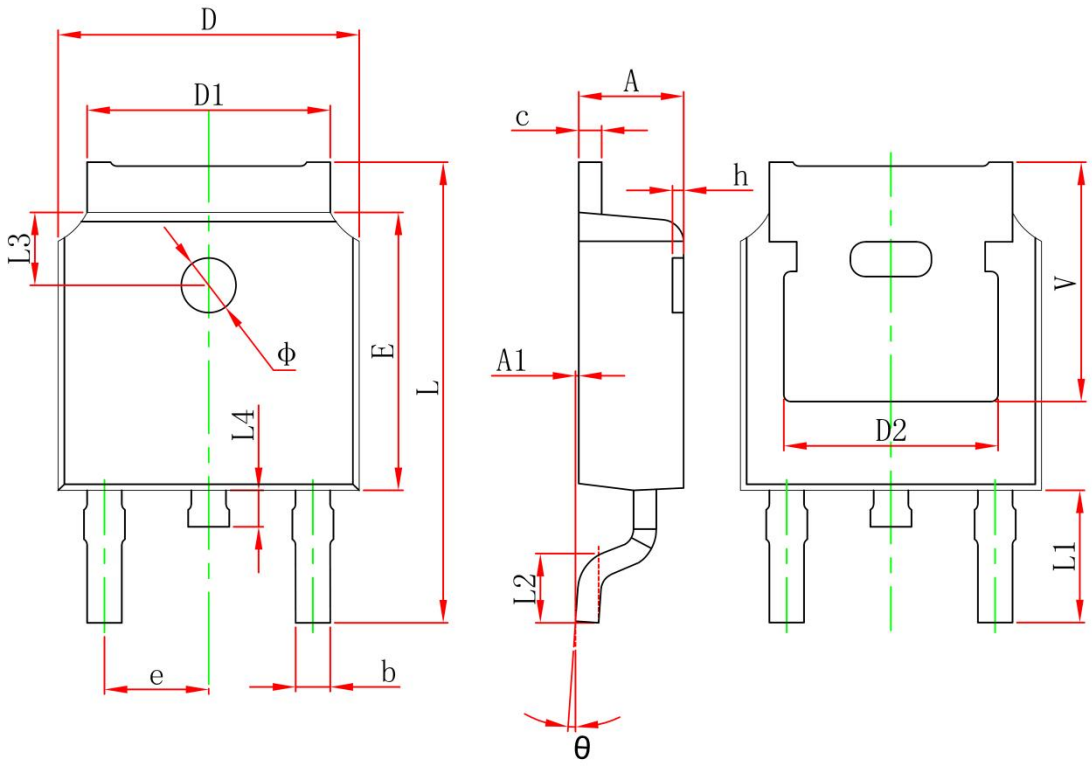


Maximum Transient Thermal Impedance



Safe Operation Area

TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

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