Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	1.5Ω@10V	220mA
	1.8Ω@4.5V	

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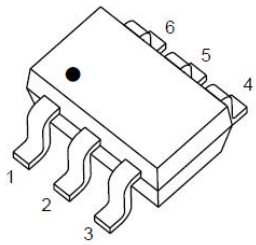
Feature

- High power and current handing capability
- Surface mount package
- ESD protected 2KV

Application

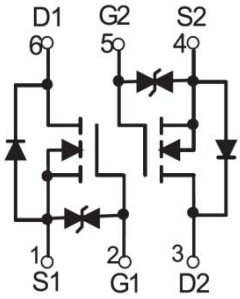
- Battery Switch
- DC/DC Converter

Package

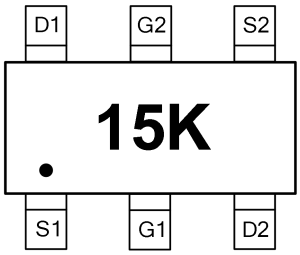


SOT-563

Circuit diagram



Marking



15K **:Device Code**

Order Information

Device	Package	Unit/Tape
SP60N1K5KDTL	SOT-563	3000

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

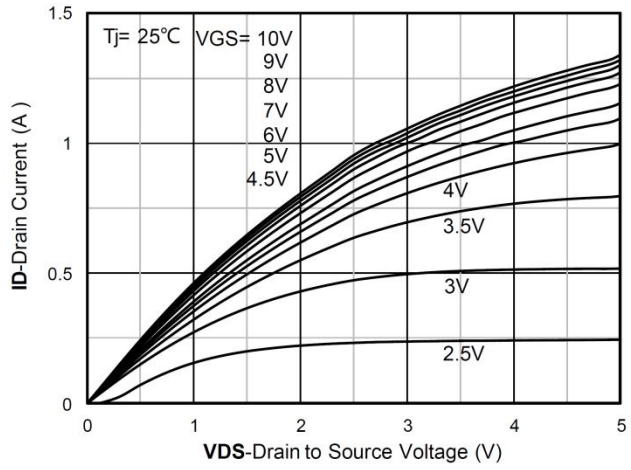
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	220	mA
Pulse Drain Current Tested	I_{DM}	880	mA
Power Dissipation	P_D	320	mW
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	390	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

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

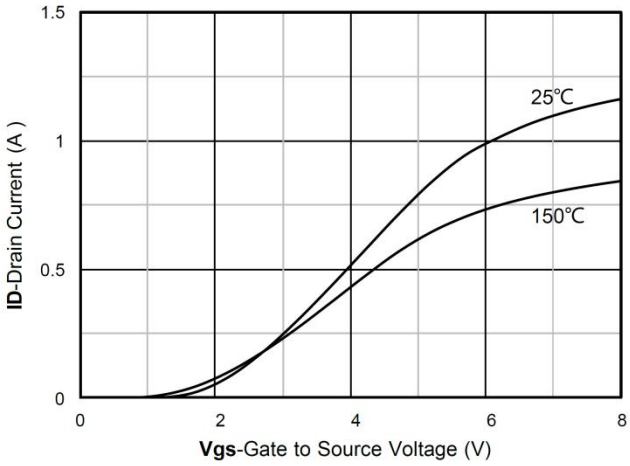
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250μA	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=48V , VGS=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	VDS=VGS , ID=250μA	0.7	1.0	1.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS =10V, ID =200mA	-	1.5	3	Ω
		VGS =4.5V, ID =200mA	-	1.8	4	
		VGS =2.5V, ID =100mA	-	2.5	8	
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=25V , VGS=0V , f=1MHz	-	12	-	pF
Output Capacitance	C_{oss}		-	6	-	
Reverse Transfer Capacitance	C_{rss}		-	2.5	-	
Total Gate Charge	Q_g	VDS=10V , VGS=15V , ID=1A	-	1.34	-	nC
Gate-Source Charge	Q_{gs}		-	0.29	-	
Gate-Drain Charge	Q_{gd}		-	0.2	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VDD=15V VGS=10V , RG=2.3Ω , ID=1A	-	5	-	nS
Turn-On Rise Time	t_r		-	18	-	
Turn-Off Delay Time	$t_{d(off)}$		-	8	-	
Turn-Off Fall Time	t_f		-	14	-	
Source-Drain Diode characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V

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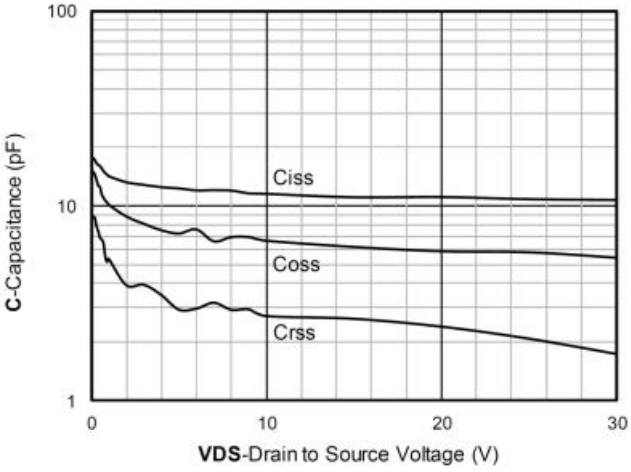
Typical Characteristics



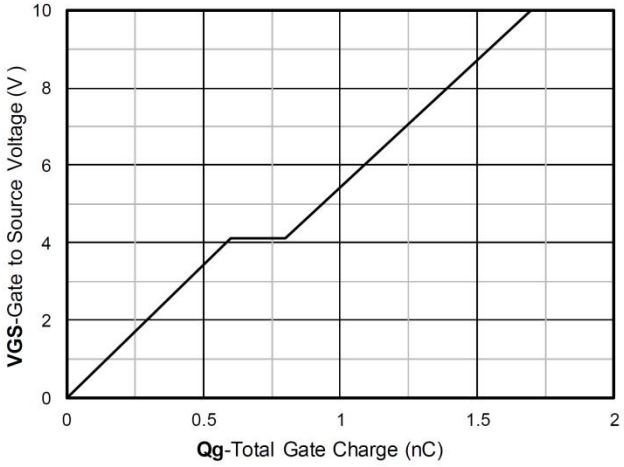
Output Characteristics



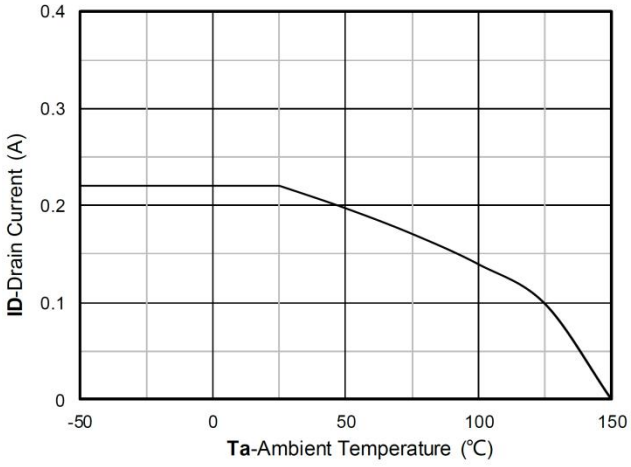
Transfer Characteristics



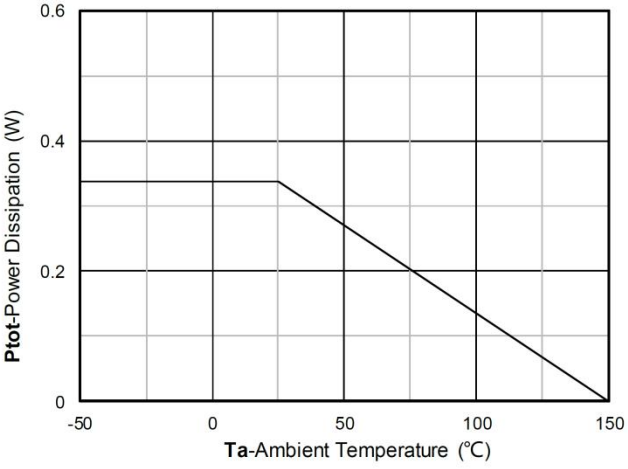
Capacitance Characteristics



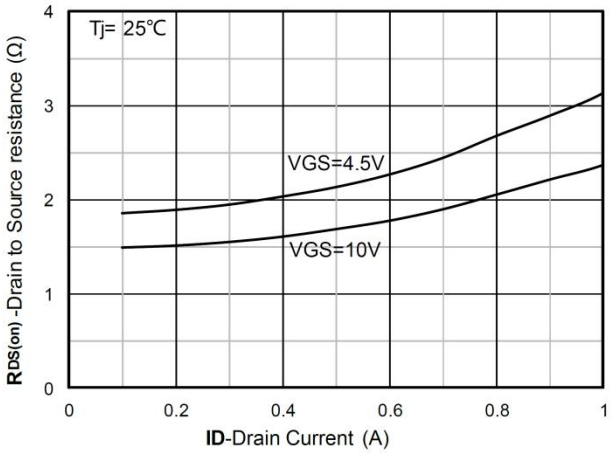
Gate Charge



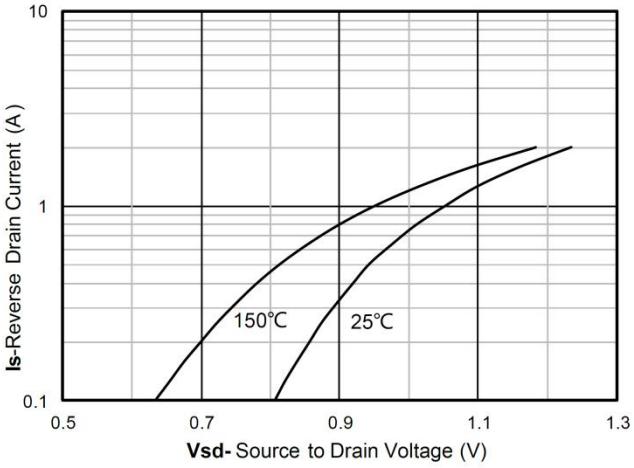
Current dissipation



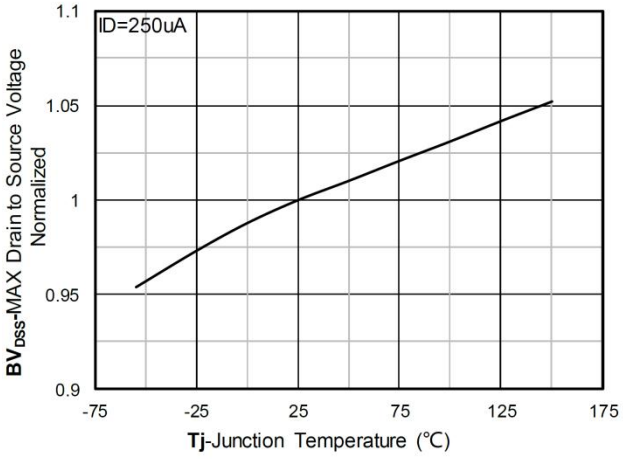
Power dissipation



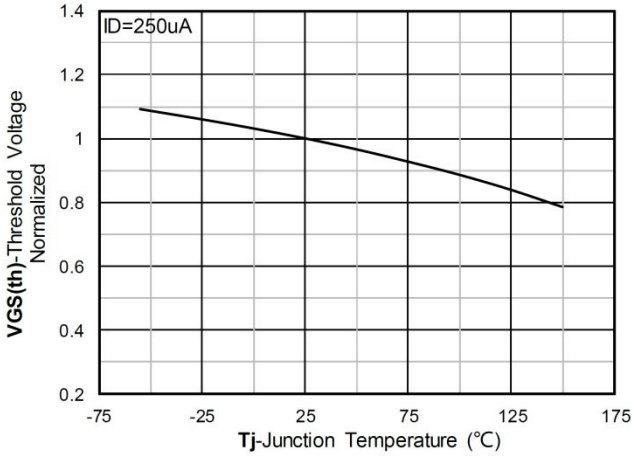
RDS(on) VS Drain Current



Forward characteristics of reverse diode

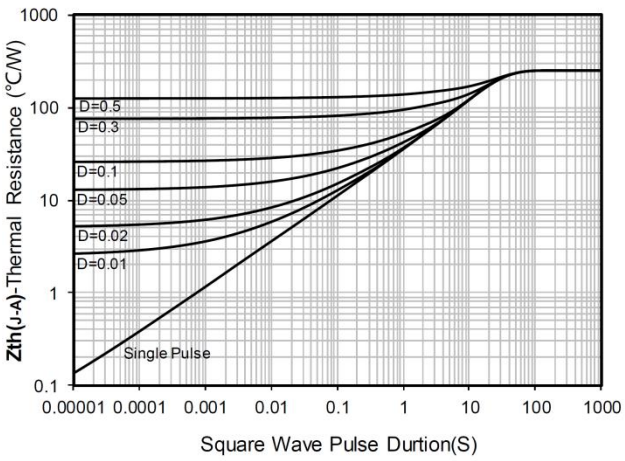


Normalized breakdown voltage

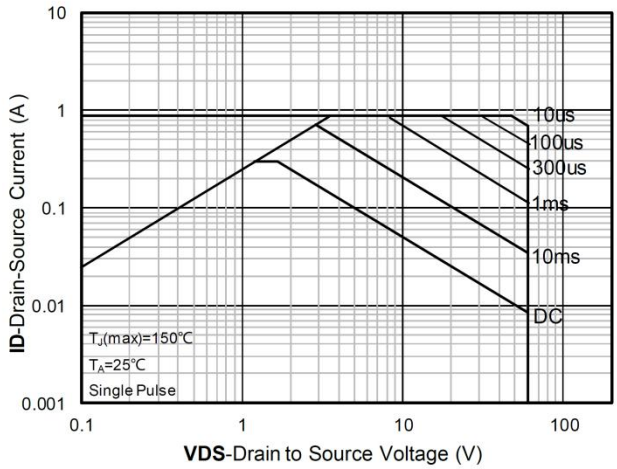


Normalized Threshold voltage

Operation in this area is limited by $R_{DS(ON)}$

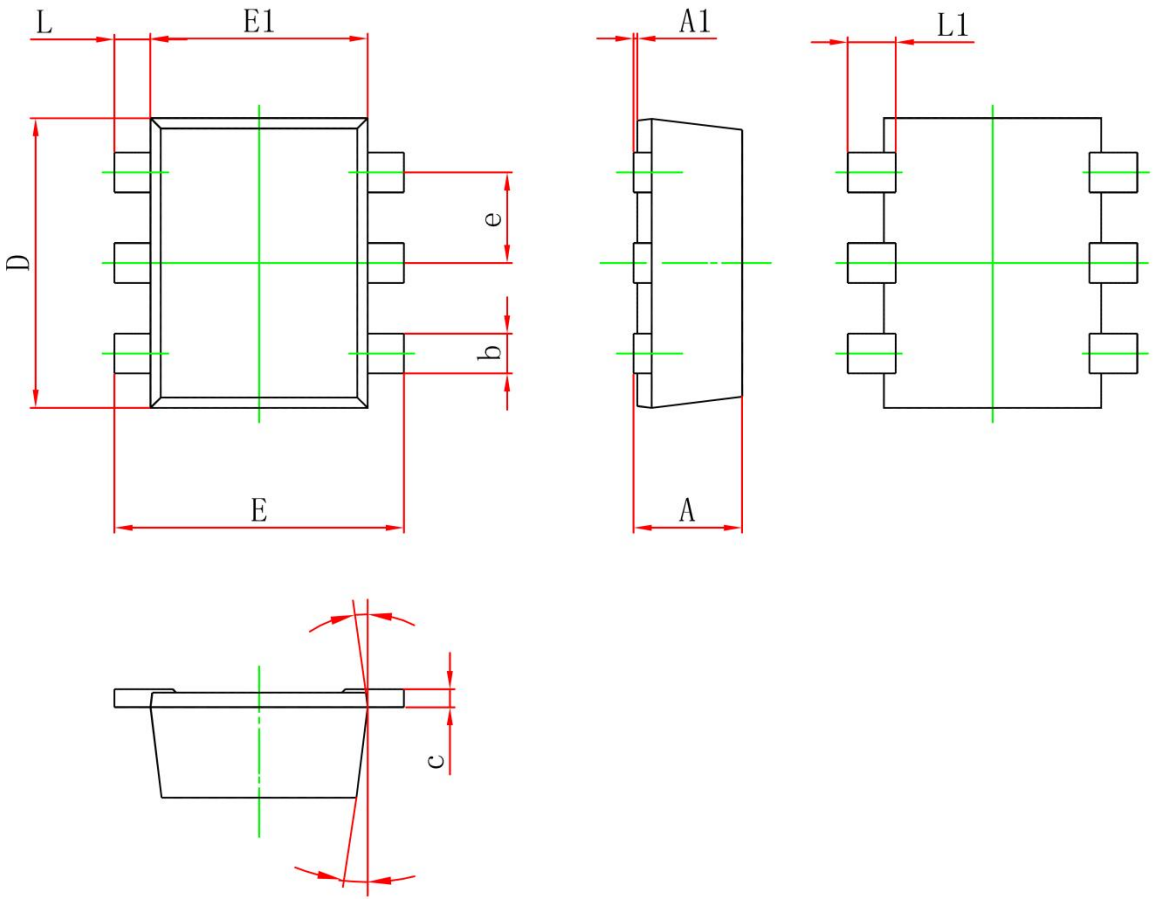


Maximum Transient Thermal Impedance



Safe Operation Area

SOT-563 Package Information



Symbol	Dimensions In Millimeters	
	Min	Max
A	0.525	0.600
A1	0.000	0.050
e	0.450	0.550
c	0.090	0.160
D	1.500	1.700
b	0.170	0.270
E1	1.100	1.300
E	1.500	1.700
L	0.100	0.300
L1	0.200	0.400
θ	7°Ref.	

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SP010N02GHTO SP015N03BGHTQ SP2002KT2 SP30P03P8 SP6023CNK SP60N02BGNK BSS123K SP20D120CTT SP30N08DP8 SP30P06DNK SP015N09GHNK SP13HF30TO SP40N25DP8 SP010P190T8 SP80N03BGHNK SP40N01AGNP SP60N13NK SP60N08GTH SP020N08GHTO SP13HF30TF SP2012CNJ SP40N01AAGTO BSS84 SP010N07AGNK SP015N03BGHTO SP40N06NK 2N7002W SP10HF25TO SP85N02AGHTO 2SK3019