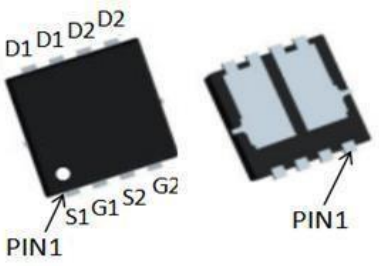
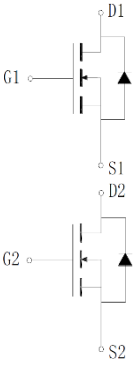
SGD60N15QD

60V Dual N-Channel Power MOSFET

Key Performance Parameters		
Parameter	**Value**	**Unit**
VDSS	60	V
RDS(ON)max.VGS=10V	15	mΩ
ID	40	A
QG	49	nC

PDFN5×6 Dual





Features	**Application**
• Excellent $R_{ds(on)}$ and low gate charge • 100% UIS tested • 100% ΔV_{DS} tested • Halogen-free; RoHS-compliant • Pb-free plating	• Load switch • PWM application • Power management

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantuty
SGD60N15QD	Halogen-Free	PDFN5×6 Dual	QD	Tape & Reel	2500

Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous Note1	T_C= 25°C	I_D	40	A
	T_C= 100°C		28	A
Drain Current-Pulsed Note2	T_C= 25°C	I_{DM}	Refer to Figure: Peak Current Capacity	A
Avalanche Current Note3		I_{AS}	16	A
Single Pulse Avalanche Energy Note3		E_{AS}	65	mJ
Maximum Power Dissipation	T_C= 25°C	P_{tot}	113	W
	T_C= 100°C		45	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

Thermal Resistance Ratings

Parameter	Conditions	Min.		Max.	Unit
Thermal resistance, Junction-to-Ambient Note4	Steady State			42	°C/W
Thermal resistance, Junction-to-Case Note4	Steady State			1.1	°C/W

Notes:

1. The maximum current rating is packagelimited.
2. Max. current is limited by junction temperature.
3. EAS condition: Starting T_J=25C, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=16A, V_{DD}=0V during time in avalanche.
4. $R_{\theta JA}$ is measured with the device mounted on 1inch^2 pad of 2oz copper FR4 PCB.

Electrical Characteristics (T_J=25°C unless otherwise noted)

STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_{DS}=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA

STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.1	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=30A		12.6	15	mΩ
		V_{GS}=4.5V, I_{DS}=20A		14.6	21	mΩ
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		2.3		Ω

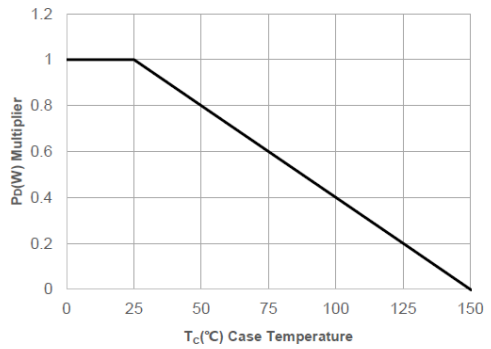
DYNAMIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V, f=1MHz		2637		pF
Output Capacitance	C_{oss}	V_{DS}=30V, V_{GS}=0V, f=1MHz		122		pF
Reverse Transfer Capacitance	C_{rss}	V_{DS}=30V, V_{GS}=0V, f=1MHz		98		pF
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=30V, V_{GS}=10V, I_{DS}=30A, R_{GEN}=3Ω		9		ns
Rise Time	t_r	V_{DS}=30V, V_{GS}=10V, I_{DS}=30A, R_{GEN}=3Ω		28		ns
Turn-Off Delay Time	$T_{d(off)}$	V_{DS}=30V, V_{GS}=10V, I_{DS}=30A, R_{GEN}=3Ω		44		ns
Fall Time	t_f	V_{DS}=30V, V_{GS}=10V, I_{DS}=30A, R_{GEN}=3Ω		7		ns

GATE CHARGECHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate to Source Gate Charge	Q_{gs}	V_{GS}= 0 to 10V, V_{DD}=30V, I_D=30A		10		nC
Gate to Drain Charge	Q_{gd}	V_{GS}= 0 to 10V, V_{DD}=30V, I_D=30A		9		nC
Gate Charge Total	Q_G	V_{GS}= 0 to 10V, V_{DD}=30V, I_D=30A		49		nC

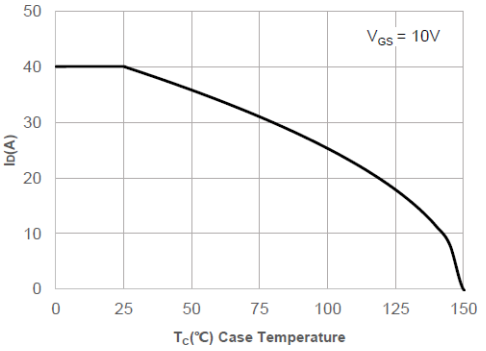
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Continuous Diode Forward Current	I_S				40	A
Maximum Pulsed Forward Current	I_{SM}				160	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=30A			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=30A, di/dt=100A/μs		21		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=30A, di/dt=100A/μs		21		nC

TypicalOperating Characteristics

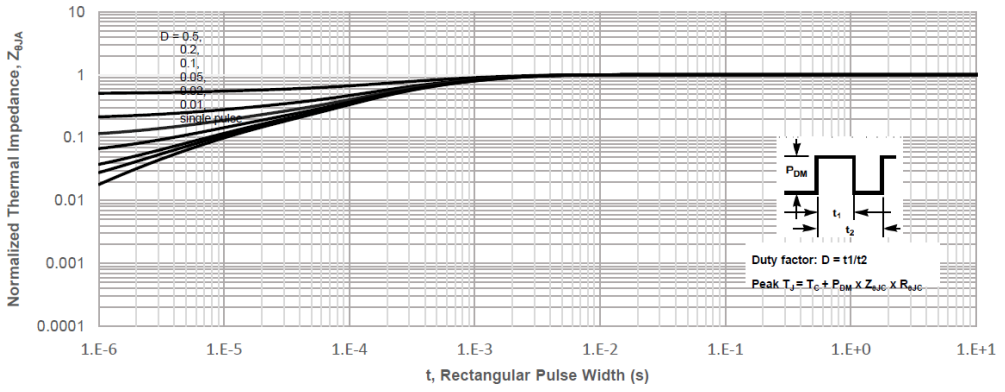
TYP. Power Dissipation vs Case Temperature



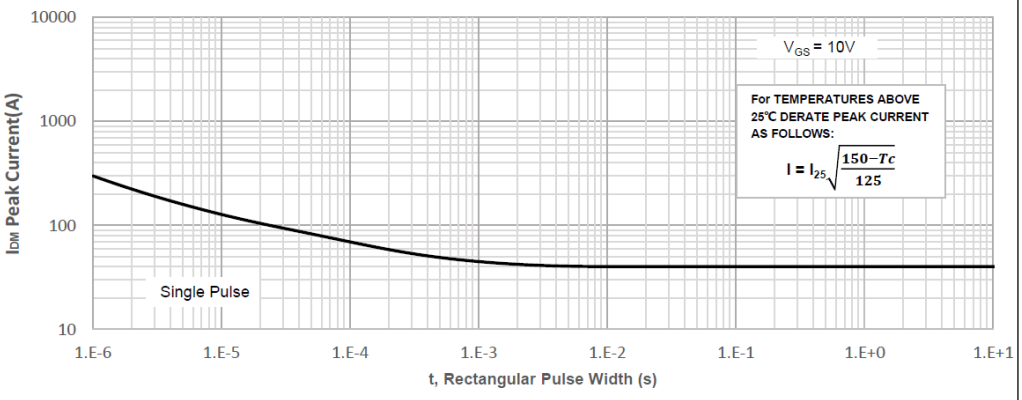
TYP. Current Rating vs Case Temperature



TYP. Normalized Maximum Transient Thermal Impedance

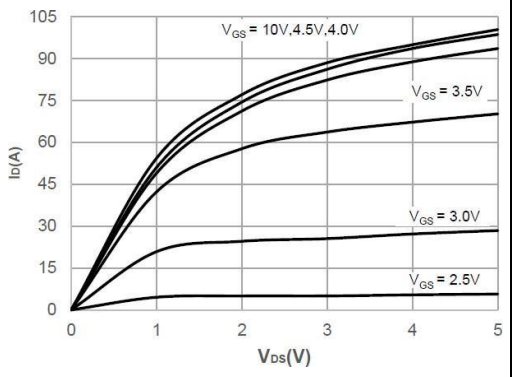


TYP. Peak Current Capacity

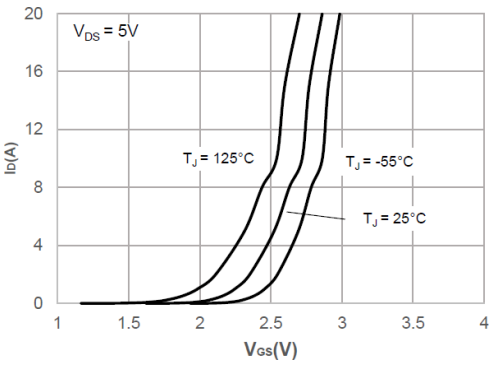


TypicalOperating Characteristics

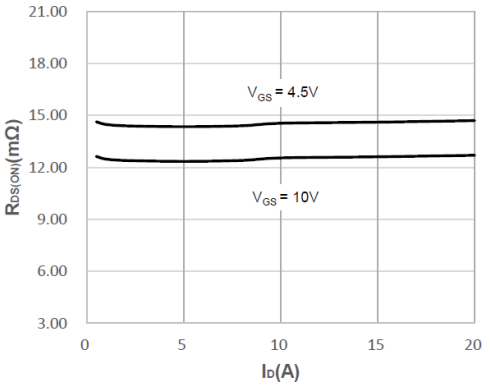
TYP. Output Characteristics



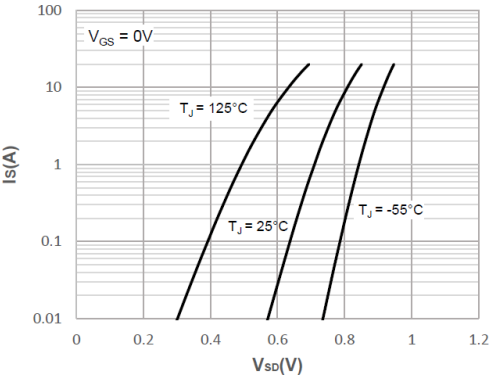
TYP. Typical Transfer Characteristics



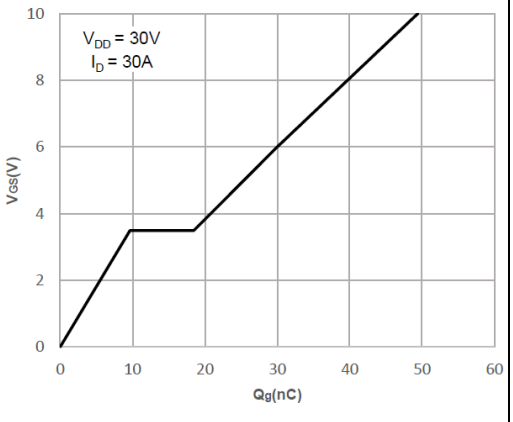
TYP. On-resistance vs. Drain Current



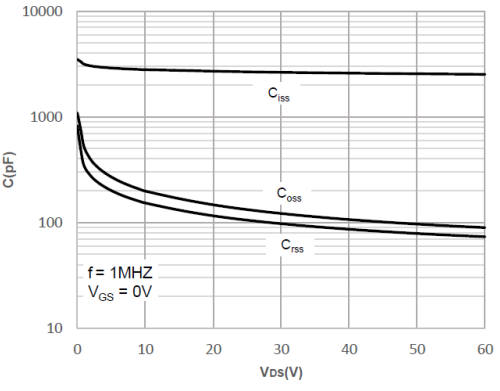
TYP. Body Diode Characteristics



TYP. Gate Charge Characteristics

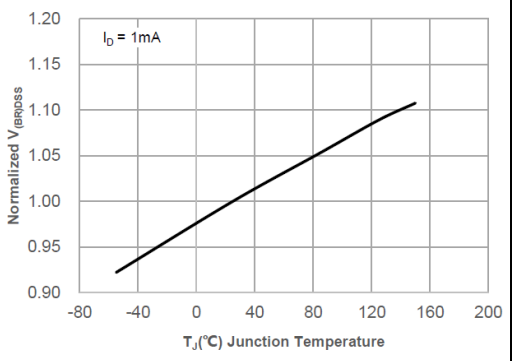


TYP. Capacitance Characteristics

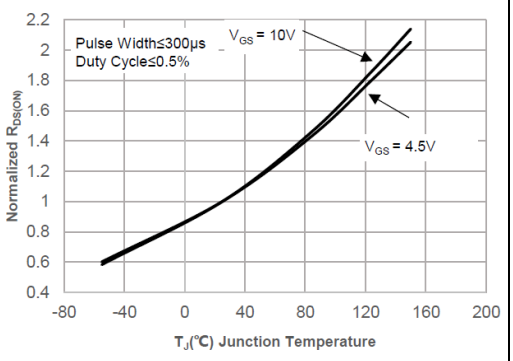


TypicalOperating Characteristics

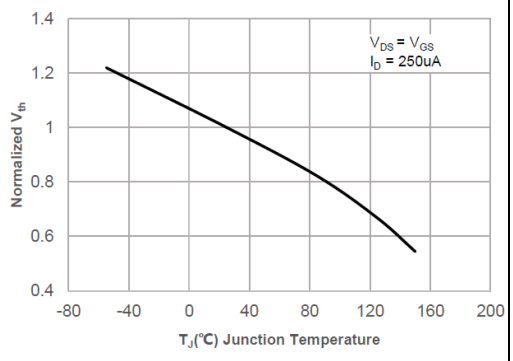
TYP. Normalized Breakdown voltage vs. Junction Temperature



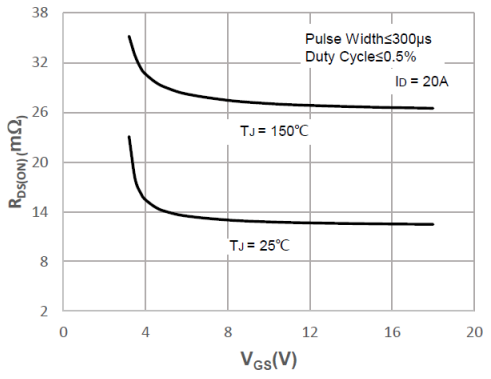
TYP. Normalized on Resistance vs. Junction Temperature



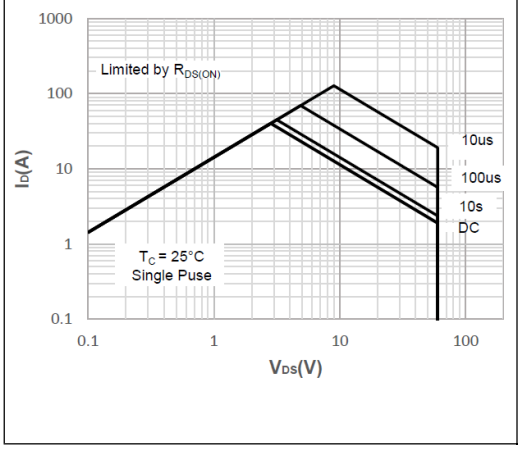
TYP. Normalized Threshold Voltage vs. Junction Temperature



TYP. Normalized on Resistance vs. Normalized Threshold Voltage

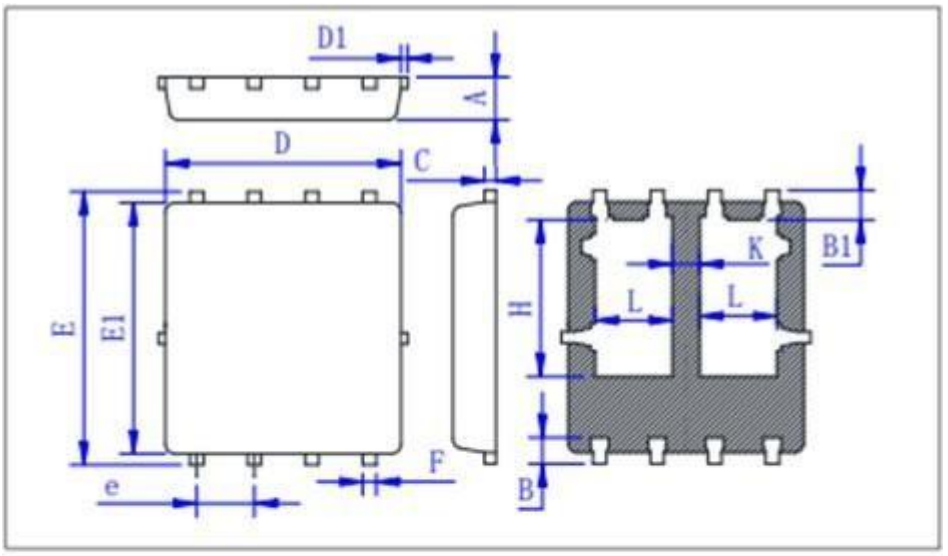


TYP. Maximum Safe Operating Area



Outline

PDFN5×6 Dual



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.48	0.58	0.68
B1	0.55	0.65	0.75
C	0.20	0.254	0.30
D	5.10	5.20	5.30
D1			0.15
E	5.95	6.05	6.15
E1	5.40	5.55	5.70
e	1.22	1.27	1.32
F	0.25	0.30	0.35
H	3.27	3.47	3.67
L	1.50	1.70	1.90
K	0.50	0.60	0.75