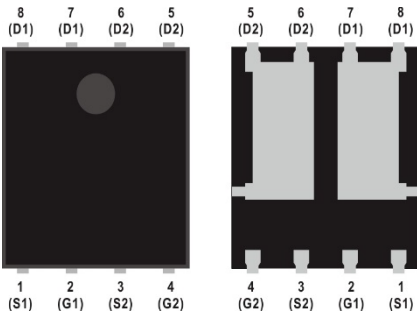
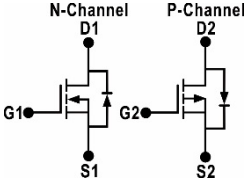


N-Channel : V_{DS} , 40V $R_{DS(ON)}$, 28mΩ (max.) @ $V_{GS}=10V$ $R_{DS(ON)}$, 40mΩ (max.) @ $V_{GS}=4.5V$ I_D , 26A	P-Channel : V_{DS} , -40V $R_{DS(ON)}$, 42mΩ (max.) @ $V_{GS}=-10V$ $R_{DS(ON)}$, 68mΩ (max.) @ $V_{GS}=-4.5V$ I_D , -25A	PDFN 5x6-8L (Dual) 	
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Description	Features
The SGD4226QD uses advanced trench technology MOSFETs to provide excellent $R_{DS(ON)}$ and low gate charge.	• Low On-Resistance • Low Input Capacitance • Low Miller Charge • Pb-free lead plating; RoHS compliant
The complementary Power MOSFETs may be used in H-bridge, Inverters and other applications.	Applications
	• Motor / Body Load Control • Automotive Systems • Load Switch

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
SGD4226QD	Halogen-Free	PDFN 5x6-8L (Dual)	QD	Tape & Reel	2,500

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Value		Unit
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	± 20		V
Drain Current-Continuous	$T_C=25^{\circ}\text{C}$	I_D	26	-25	A
	$T_C=100^{\circ}\text{C}$		16	-15	A
	$T_a=25^{\circ}\text{C}$		7.2	-5.6	A
	$T_a=70^{\circ}\text{C}$		5.7	-4.5	A
Drain Current-Pulsed ^{Note 1}		I_{DM}	47	-46	A
Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	P_D	35.7	35.7	W
	$T_C=100^{\circ}\text{C}$		14.2	14.2	W
	$T_a=25^{\circ}\text{C}$		2.0	2.0	W
	$T_a=70^{\circ}\text{C}$		1.2	1.2	W
Operating Junction Temperature Range		T_J T_{STG}	-55 to +175		$^{\circ}\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Maximum Junction-to-Ambient ^{Note 2}	$R_{\theta JA}$	Steady State	-	-	62	$^{\circ}\text{C/W}$
Maximum Junction-to-Case ^{Note 2}	$R_{\theta JC}$	Steady State	-	-	3.5	$^{\circ}\text{C/W}$

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

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =32V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	-	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =6A	-	-	28	mΩ
		V _{GS} =4.5V, I _{DS} =4A	-	-	40	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =12A	-	7	-	S

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	-	581	-	pF
Output Capacitance	C _{oss}		-	74	-	
Reverse Transfer Capacitance	C _{rss}		-	54	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{DD} =20V, V _{GS} =10V, R _G =3.3Ω, I _D =1A	-	8.7	-	ns
Rise Time	t _r		-	2.1	-	
Turn-Off Delay Time	T _{d(off)}		-	40	-	
Fall Time	t _f		-	2.6	-	
Total Gate Charge at 4.5V	Q _g	V _{DS} =20V, I _{DS} =12A, V _{GS} =4.5V	-	5.4	-	nC
Gate to Source Gate Charge	Q _{gs}		-	1.2	-	
Gate to Drain "Miller" Charge	Q _{gd}		-	2.4	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A	-	-	1.2	V
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	24	A
Pulsed Source Current	I _{SM}		-	-	47	A

Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air.

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

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-32V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =-250μA	-1	-	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _{DS} =-6A	-	-	42	mΩ
		V _{GS} =-4.5V, I _{DS} =-4A	-	-	68	
Forward Transconductance	g _{fs}	V _{DS} =-5V, I _D =-18A	-	12	-	S

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f=1MHz	-	983	-	pF
Output Capacitance	C _{oss}		-	105	-	
Reverse Transfer Capacitance	C _{rss}		-	78	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{DD} =-15V, V _{GS} =-10V, R _G =3.3Ω, I _D =-1A	-	18.8	-	ns
Rise Time	t _r		-	12.5	-	
Turn-Off Delay Time	T _{d(off)}		-	47.6	-	
Fall Time	t _f		-	4.5	-	
Total Gate Charge at -4.5V	Q _g	V _{DS} =-20V, I _{DS} =-12A, V _{GS} =-4.5V	-	8.8	-	nC
Gate to Source Gate Charge	Q _{gs}		-	2.4	-	
Gate to Drain "Miller" Charge	Q _{gd}		-	3	-	

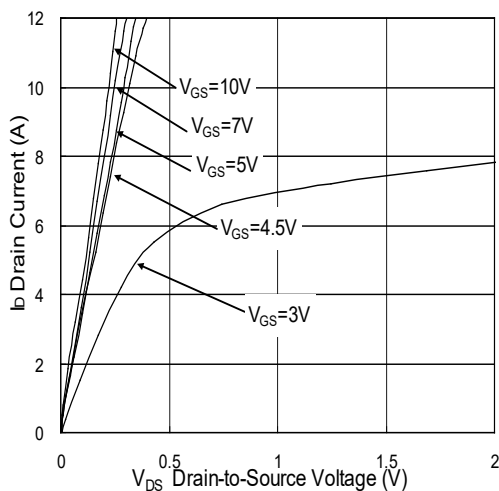
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A	-	-	-1.2	V
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	-25	A
Pulsed Source Current	I _{SM}		-	-	-46	A

Notes:

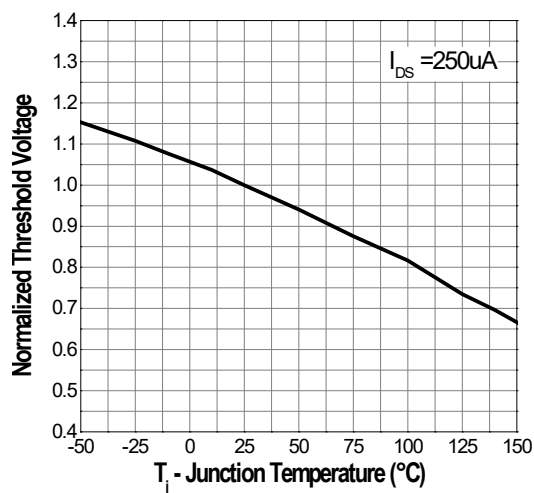
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air.

N-Channel Typical Operating Characteristics

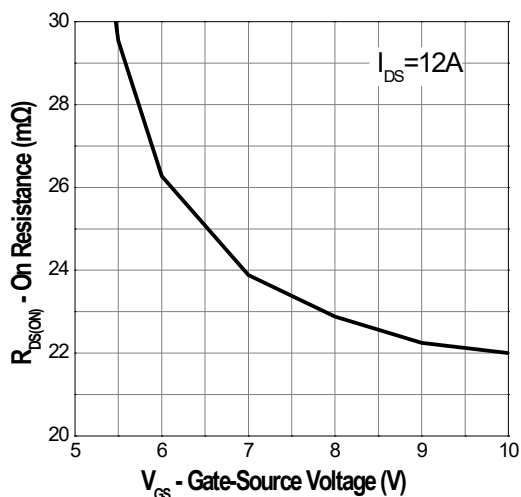
Output Characteristics



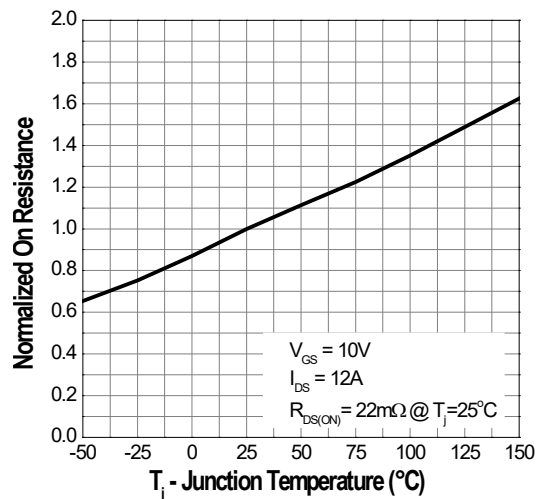
Gate Threshold Voltage



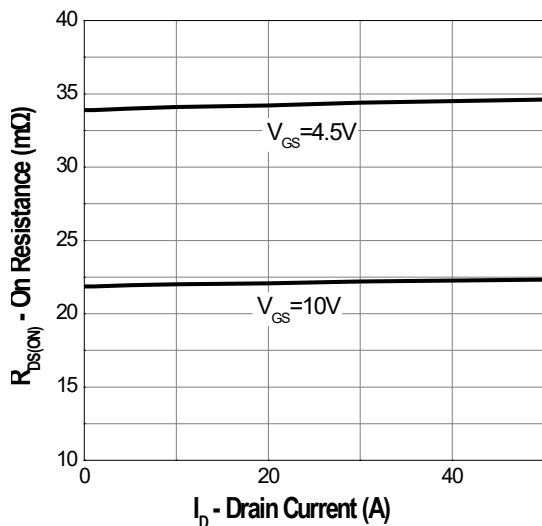
Gate-Source On Resistance



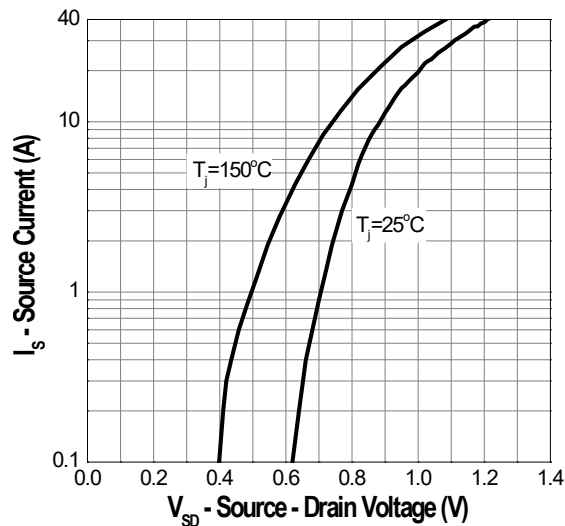
Drain-Source On Resistance



Drain-Source On Resistance

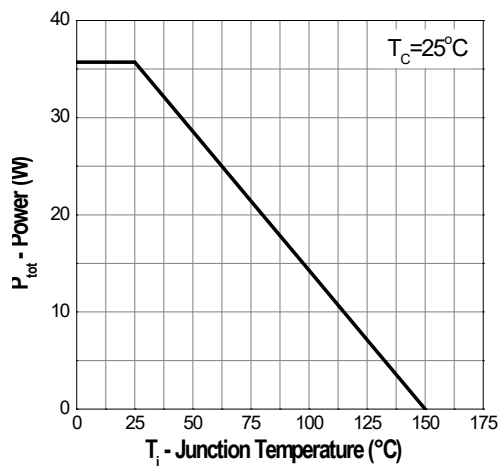


Source-Drain Diode Forward

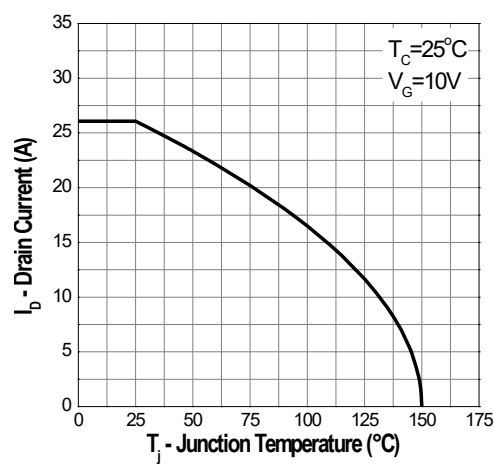


N-Channel Typical Operating Characteristics (Cont.)

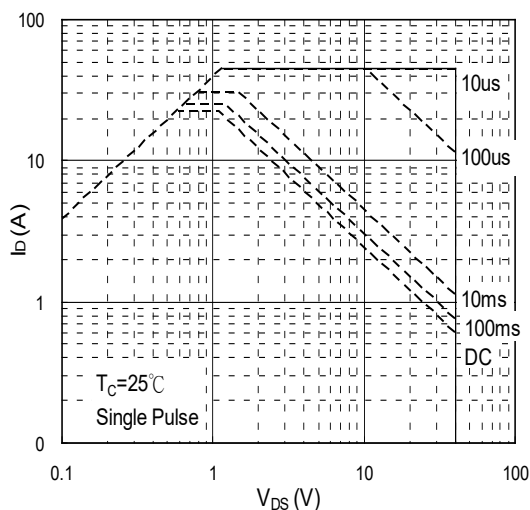
Power Dissipation



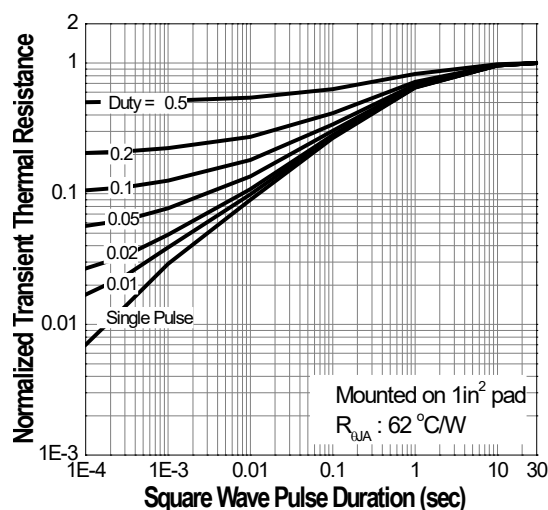
Drain Current



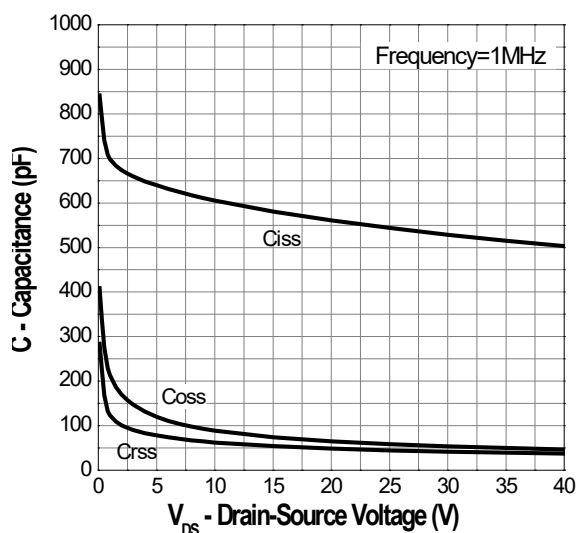
Safe Operation Area



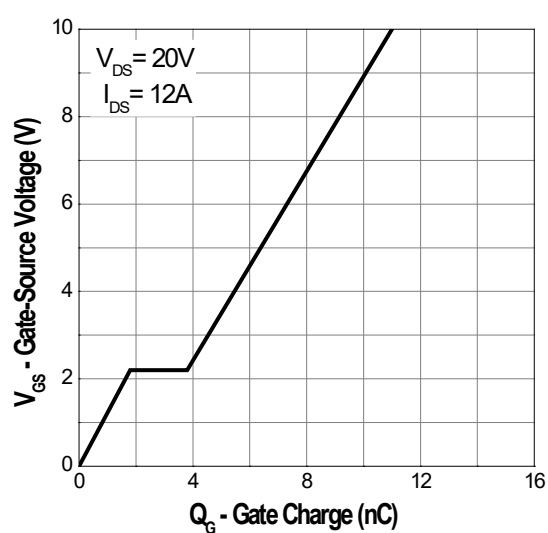
Thermal Transient Impedance



Capacitance

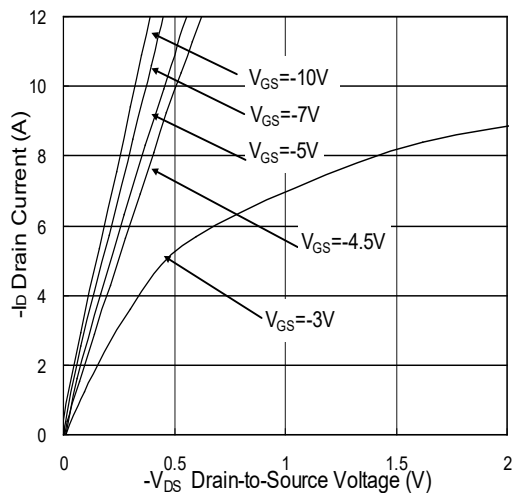


Gate Charge

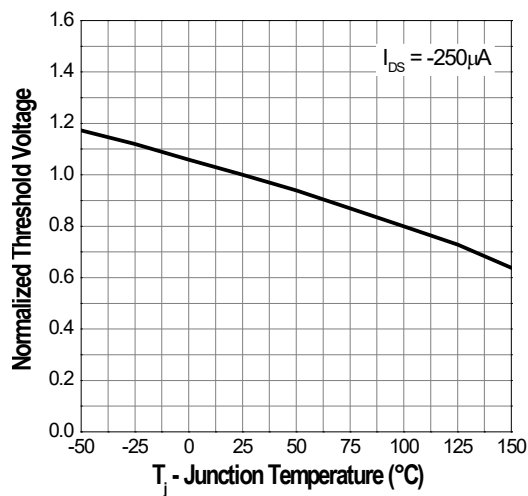


P-Channel Typical Operating Characteristics

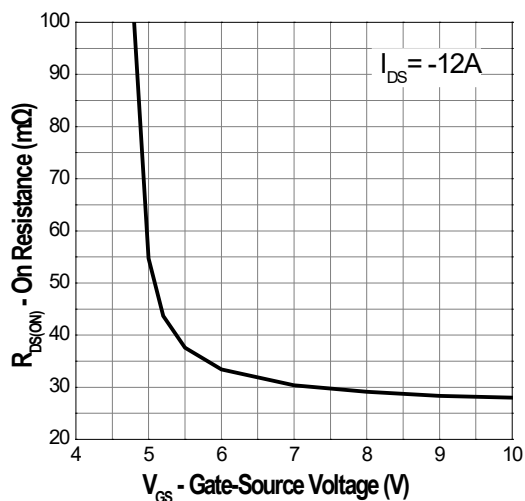
Output Characteristics



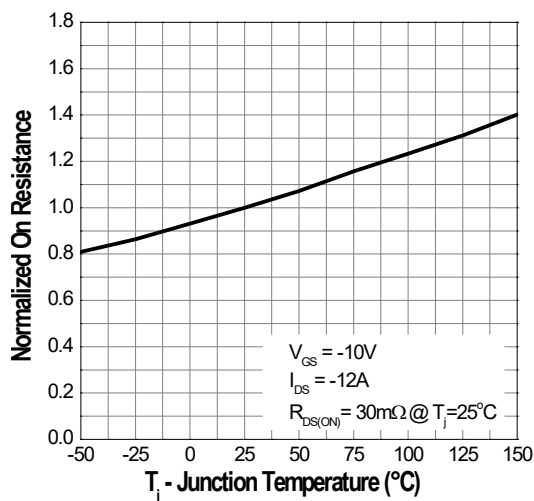
Gate Threshold Voltage



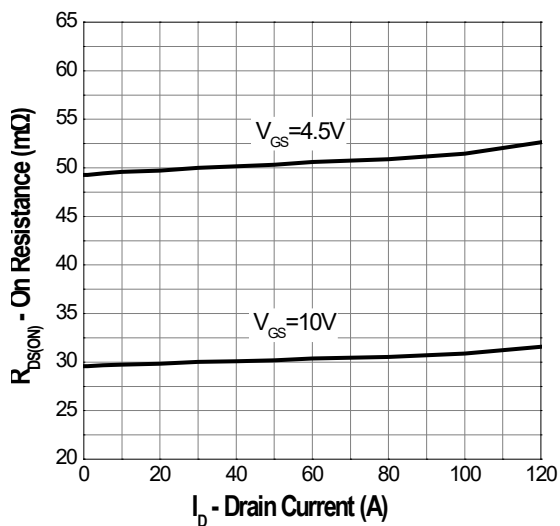
Gate-Source On Resistance



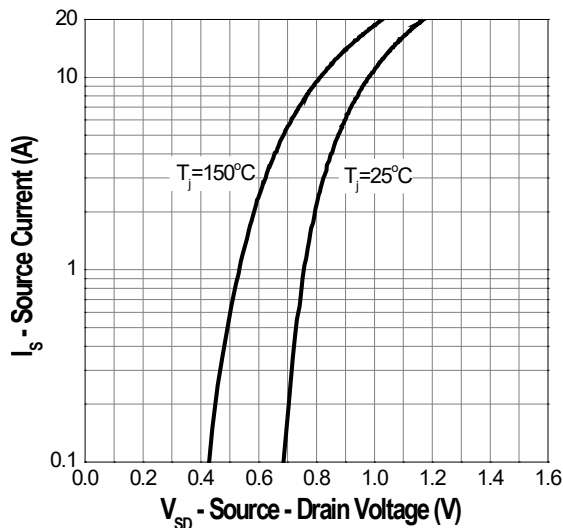
Drain-Source On Resistance



Drain-Source On Resistance

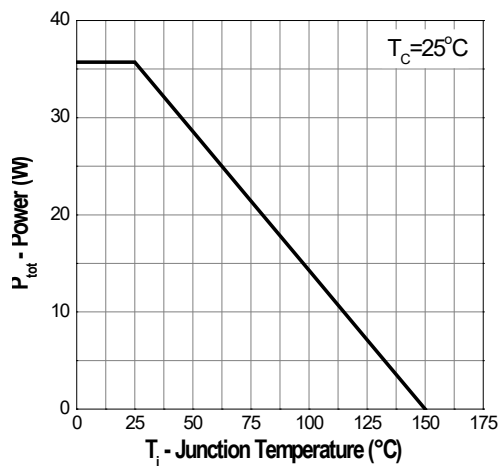


Source-Drain Diode Forward

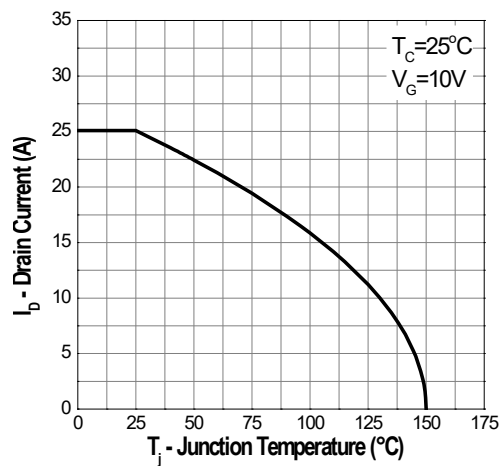


P-Channel Typical Operating Characteristics (Cont.)

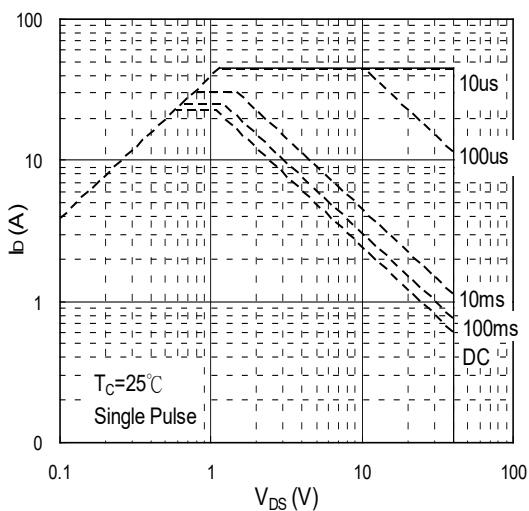
Power Dissipation



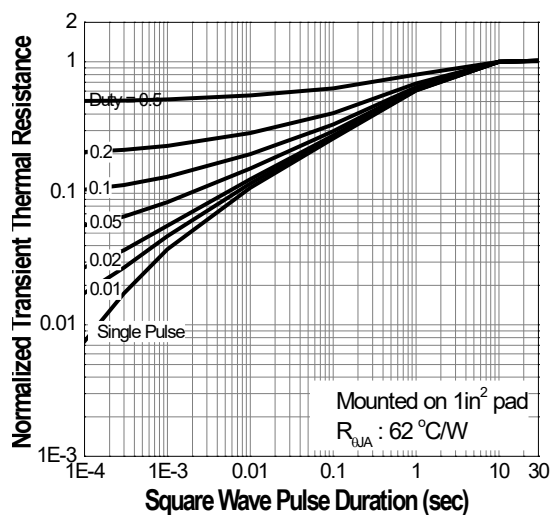
Drain Current



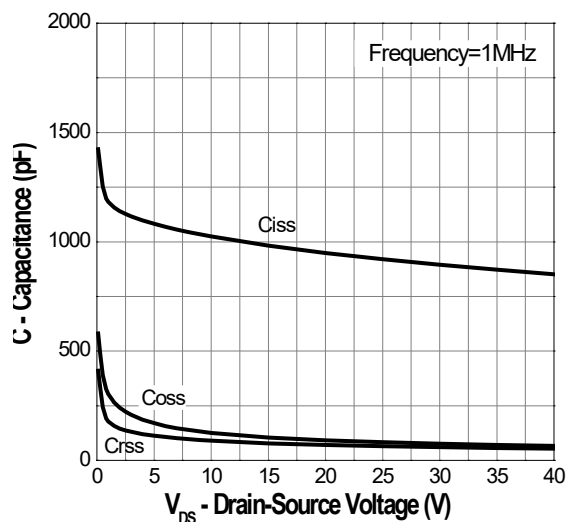
Safe Operation Area



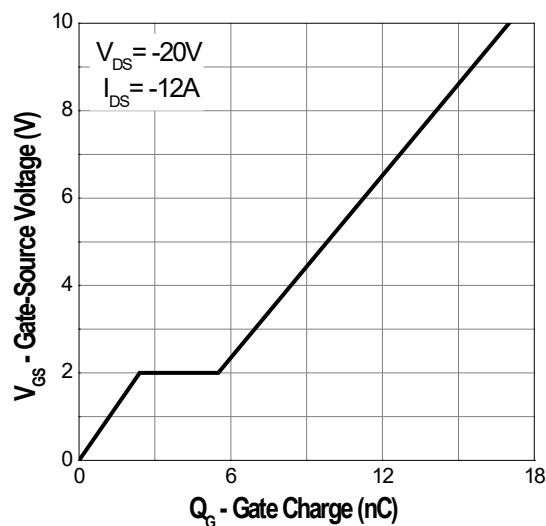
Thermal Transient Impedance



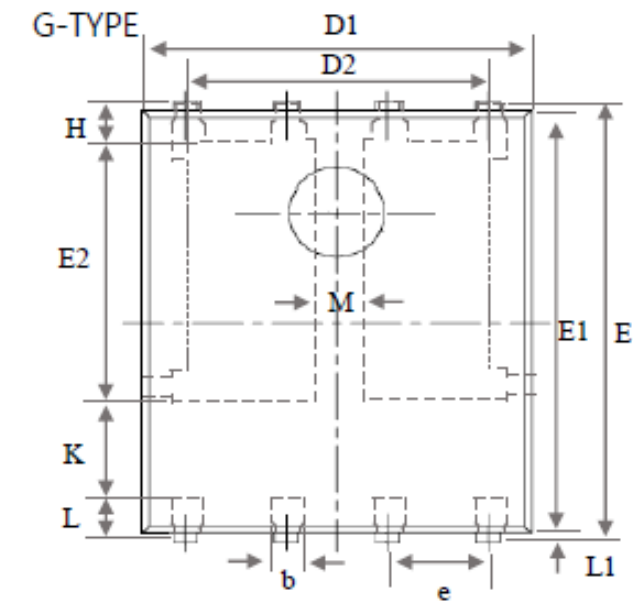
Capacitance



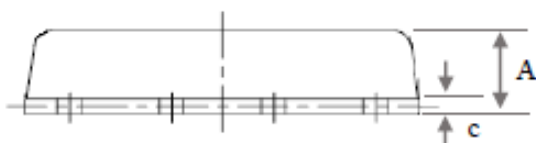
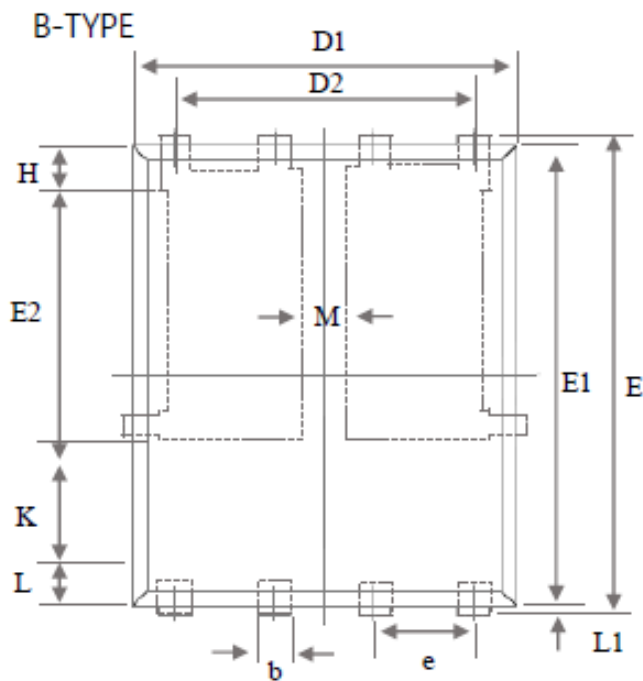
Gate Charge



Package of Dimension



Symbol	Min	Nor	Max
A	0.90	1.04	1.17
b	0.33	0.42	0.51
c	0.203 BSC		
D1	4.80	4.90	5.00
D2	3.61	3.96	4.30
E	5.90	6.03	6.15
E1	5.65	5.75	5.85
E2	3.30	3.54	3.78
e	1.27 BSC		
H	0.38	0.50	0.61
K	1.10	-	-
L	0.38	0.56	0.74
L1	0.50	0.38	0.25
M	0.50	-	-

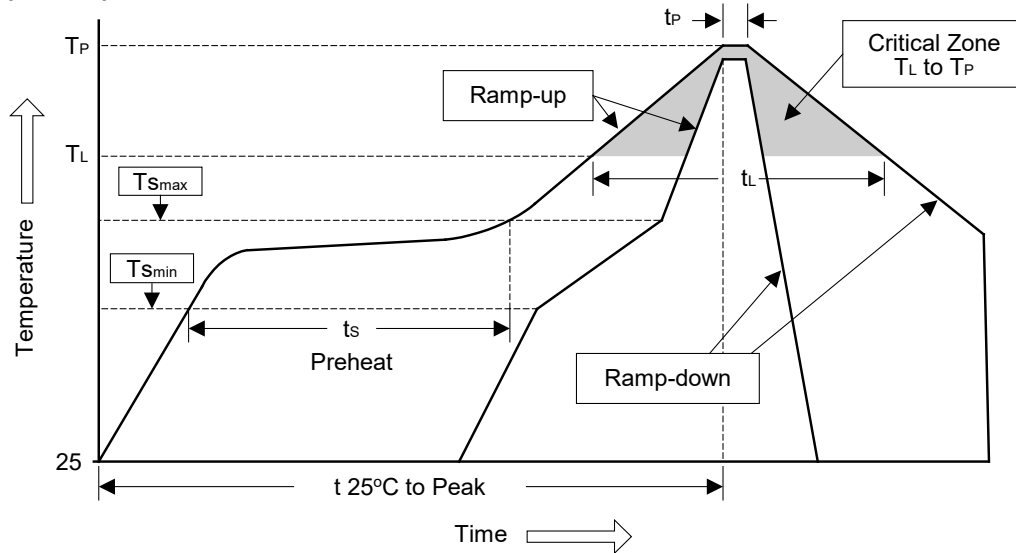


1. All dimension are in millimeters.
2. Dimension does not include burrs and mold flash/protrusions.

Soldering Methods for Silicongear's Products

- Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
- Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (TL to TP)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (TSmin)	100°C	150°C
- Temperature Max (TSmax)	150°C	200°C
- Time (min to max) (ts)	60 to 120 sec	60 to 180 sec
TSmax to TL		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (TL)	183°C	217°C
- Time (tL)	60 to 150 sec	60 to 150 sec
Peak Temperature (TP)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (tP)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec

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