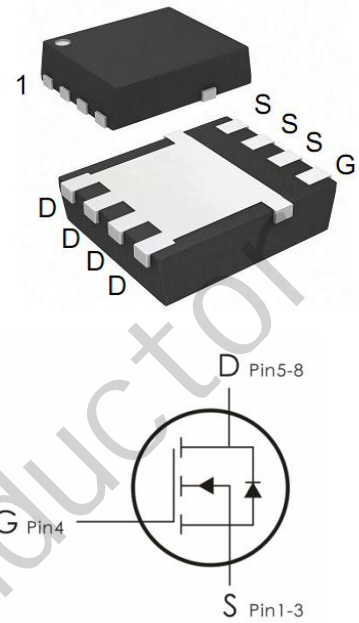


Description:

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=121A, R_{DS(ON)} < 2.6m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$ ⁽¹⁾	121	A
	Continuous Drain Current- $T_C=100^\circ C$ ⁽¹⁾	77	
	Continuous Drain Current- $T_A=25^\circ C$ ⁽²⁾	24	
	Continuous Drain Current- $T_A=100^\circ C$ ⁽³⁾	15	
I_{DM}	Pulsed Drain Current ⁽⁴⁾	240	
E_{AS}	Avalanche energy, single pulse ⁽⁵⁾	106	mJ
I_{AS}	Avalanche Current ⁽⁶⁾	35	A
P_D	Power Dissipation	72.7	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.72	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance Junction to mbient	45	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics: ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V, T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Drain-to-Source Leakage Current	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.1	---	2.2	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=30A$	---	2.2	2.6	m Ω
		$V_{GS}=4.5V, I_D=30A$	---	2.8	3.6	
G_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 20A, T_J=25^{\circ}\text{C}$	---	105	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	2780	---	pF
C_{oss}	Output Capacitance		---	1050	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V, V_{GS}=10V, R_G=3\Omega, I_D=20A, T_J=25^{\circ}\text{C}$	---	4	---	ns
t_r	Rise Time		---	5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	35	---	ns
t_f	Fall Time		---	11	---	ns

Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V,$ $I_D=20A, T_J=25^\circ C$	---	46	---	nC
Q_{gs}	Gate-Source Charge		---	8.7	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	5.4	---	nC
Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{SD}	Forward Voltage	$V_{GS}=0V, I_S=50A, T_J=25^\circ C$	---	0.83	---	V
t_{rr}	Continuous Source Current	$V_{GS} = 0V, I_S = 20A,$	---	43	---	ns
q_{rr}	Pulsed Source Current	$dI_S/dt = 100A/\mu s, T_J = 25^\circ C$	---	53	---	nC

Notes:

- (1) Rated according to $R_{\theta JC}$.
- (2) Rated according to $R_{\theta JA}$.
- (3) Surface-mounted on 1 inch² FR4 board, 2 oz Cu.
- (4) Limited by maximum T_J .
- (5) Starting $T_J = 25^\circ C, L = 0.1mH, V_{DD} = 30V, V_{GS} = 10V$.
- (6) Pulse width limited by maximum T_J .

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

Fig.1 Output characteristics

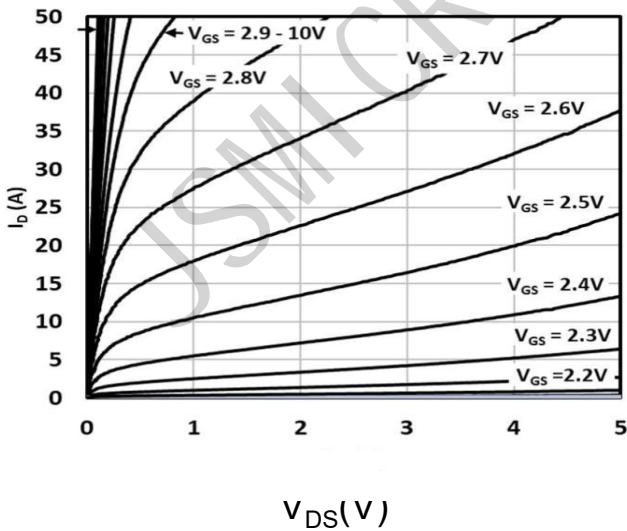


Fig.2 Transfer characteristics

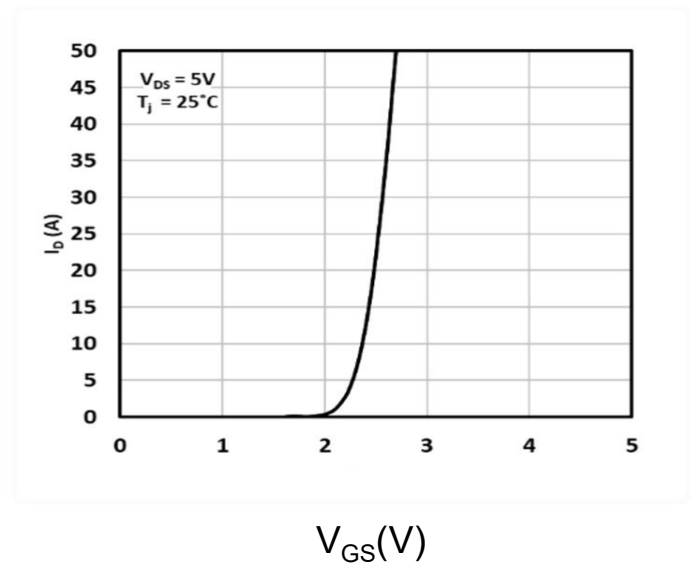


Fig.3 On-resistance vs. gate voltage

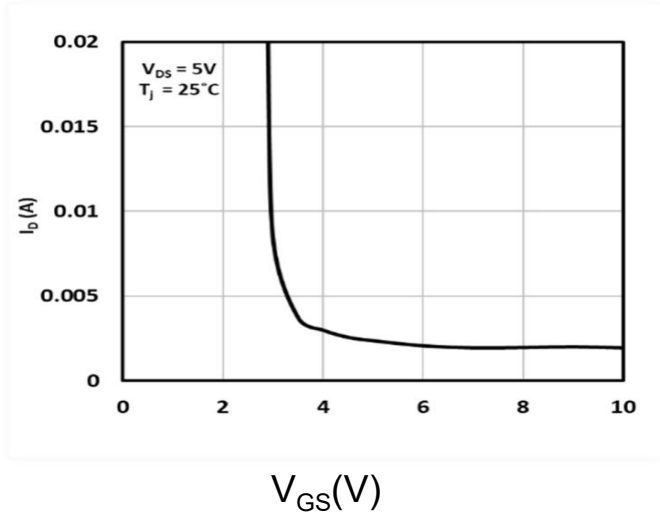


Fig.4 On-resistance vs. drain current

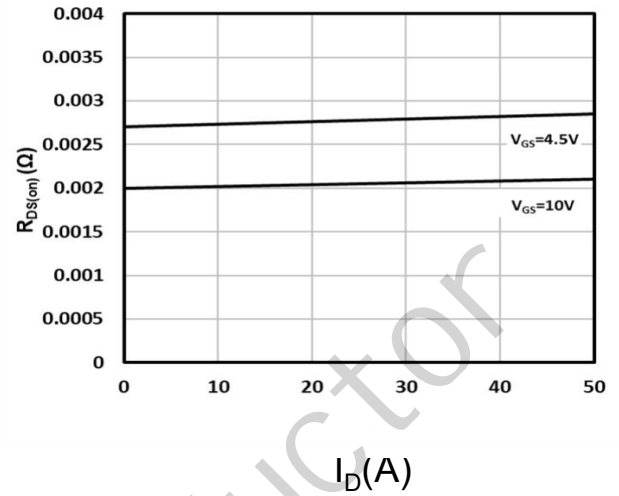


Fig.5 Source-to-drain diode forward characteristics

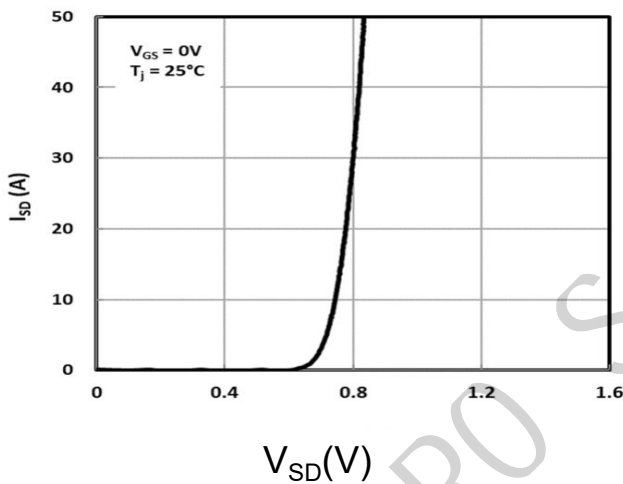


Fig.6 Capacitance vs. drain-to-source voltage

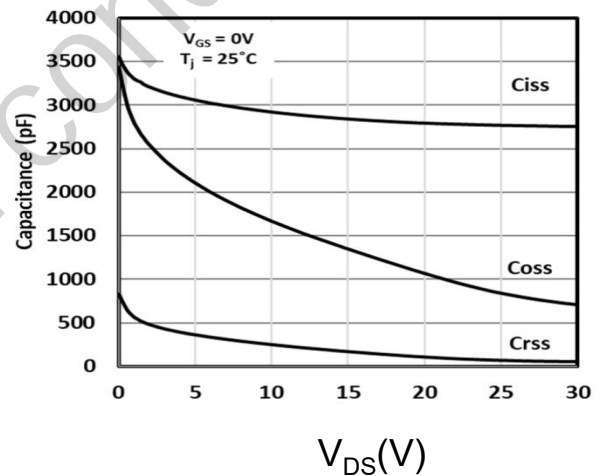


Fig.7 Gate-to-source voltage vs. gate charge

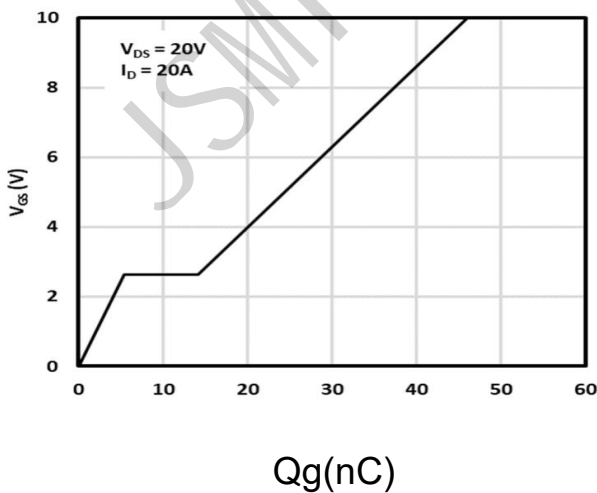


Fig.8 Maximum drain current VS. case temperature

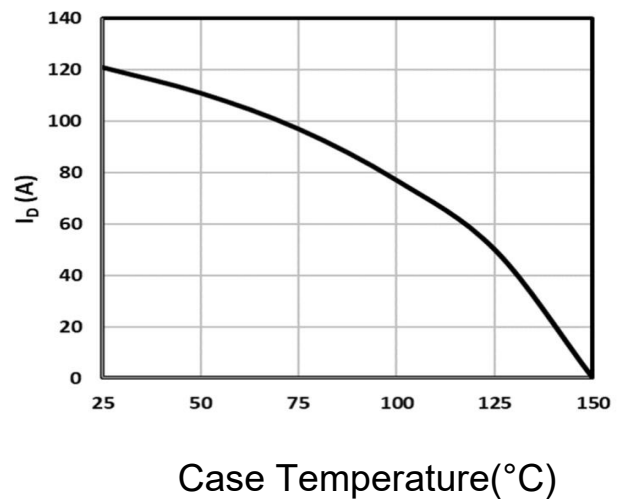
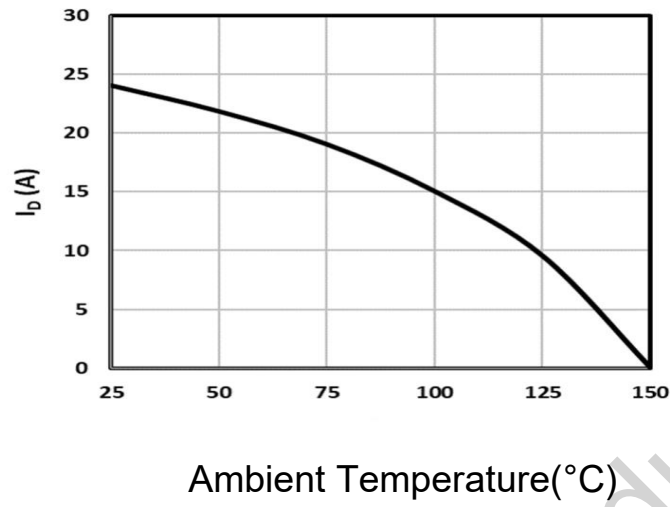
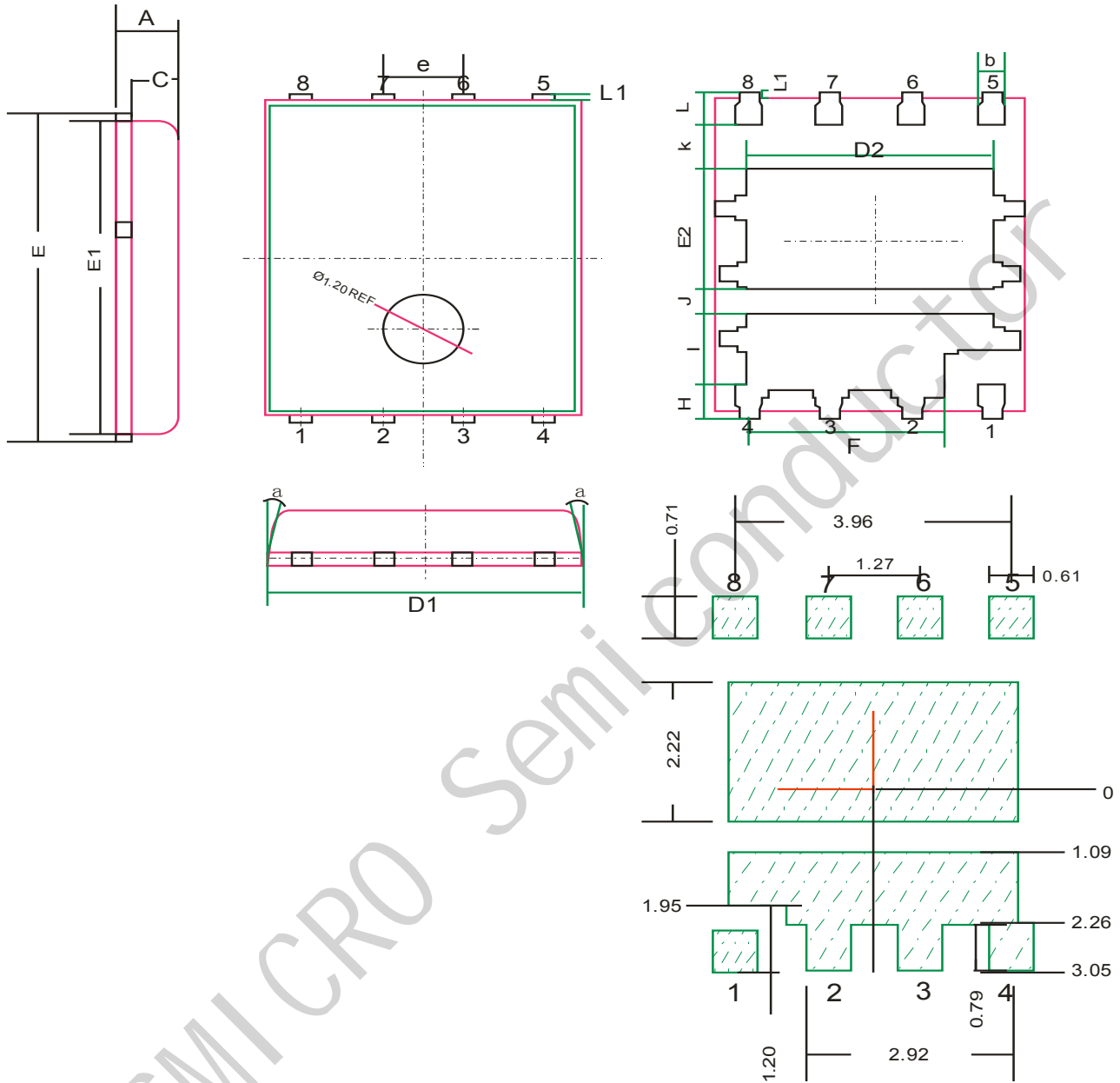


Fig. 9 Maximum drain current Vs. ambient temperature



Package Information

PDFN5060



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043	E1	5.70	5.75	5.80	0.224	0.226	0.228
b	0.33	0.41	0.51	0.013	0.016	0.020	E2	2.02	2.17	2.32	0.079	0.085	0.091
c	0.20	0.25	0.30	0.008	0.010	0.012	e	1.27BSC			0.05BSC		
D1	4.80	4.90	5.00	0.189	0.193	0.197	H	0.48	0.58	0.68	0.018	0.022	0.026
D2	3.61	3.81	3.96	0.142	0.150	0.156	L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008							
E	5.90	6.00	6.10	0.232	0.236	0.240	@	0°	*	12°	*	10°	12°
K	0.50	*	*	0.019	*	*	J	0.40	0.50	0.60	0.015	0.019	0.023
I	1.22	1.32	1.42	0.048	0.051	0.055	F	2.87	3.07	3.22	0.112	0.12	0.126