SM03N650KLPH

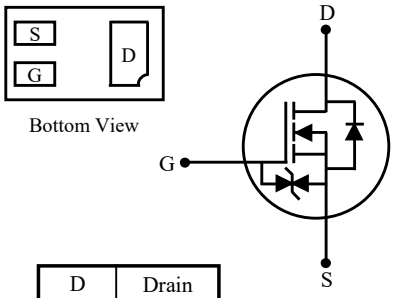
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

· Low on resistance $R_{DS(on)}$

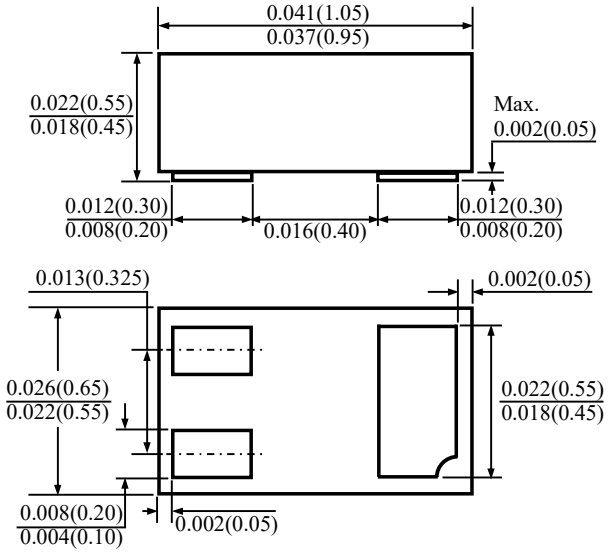
· ESD protected gate

· Suffix "H" indicates Halogen-free parts, ex. SM03N650KLPH



D	Drain
G	Gate
S	Source

DFN1006-3



Dimensions in inch and (millimeter)

Maximum Ratings(T_A=25 ℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current		I_D	700	mA
Peak Drain Current, pulsed	(Note 1)	I_{DM}	3	A
Power Dissipation	(Note 2)	P_D	690	mW
Thermal Resistance from Junction to Ambient	(Note 2)	$R_{\theta JA}$	181	℃/W
Operating and Storage Temperature Range		T_J ,T_{stg}	- 55 to + 150	℃

Note :

1. Pulse test: Pulse width≤100μs, Duty cycle≤2%, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.

2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

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Electrical Characteristics(T_A=25 ℃ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	I_D=250μA	$V_{(BR)DSS}$	30	-	-	V
Zero Gate Voltage Drain Current	V_{DS}=24V	I_{DSS}	-	-	0.1	μA
Gate Source Leakage Current	V_{GS}=±12V	I_{GSS}	-	-	±10	μA
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	0.5	-	1.5	V
Static Drain Source On-Resistance	V_{GS}=10V, I_D=700mA	$R_{DS(on)}$	-	-	600	mΩ
	V_{GS}=4.5V, I_D=590mA		-	-	650	
	V_{GS}=2.5V, I_D=590mA		-	-	900	
Forward Transconductance	V_{DS}=3V, I_D=10mA	g_{FS}	-	100	-	mS
Dynamic						
Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	R_g	-	59	-	Ω
Total Gate Charge	V_{DS}=15V, I_D=0.5A, V_{GS}=4.5V	Q_g	-	0.70	-	nC
	V_{DS}=15V, I_D=0.5A, V_{GS}=10V		-	1.72	-	
Gate-Source Charge		Q_{gs}	-	0.35	-	
Gate-Drain Charge		Q_{gd}	-	0.17	-	
Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	C_{iss}	-	43.0	-	pF
Output Capacitance		C_{oss}	-	13.0	-	
Reverse Transfer Capacitance		C_{rss}	-	9.5	-	
Turn-On Delay Time	V_{DS}=15V, V_{GS}=10V, I_D=1A, R_g=51Ω	$t_{d(on)}$	-	10.5	-	ns
Turn-On Rise Time		t_r	-	4.8	-	
Turn-Off Delay Time		$t_{d(off)}$	-	10.0	-	
Turn-Off Fall Time		t_f	-	7.5	-	
Drain-Source Body Diode						
Diode Forward Voltage	I_S=10mA	V_{SD}	-	0.7	1.2	V
Diode Continuous Forward Current	-	I_S	-	-	700	mA
Reverse Recovery Time	I_S=1A, di/dt=100A/μs	t_{rr}	-	6.3	-	ns
Reverse Recovery Charge		Q_{rr}	-	2	-	nC

RATINGS AND CHARACTERISTIC CURVES

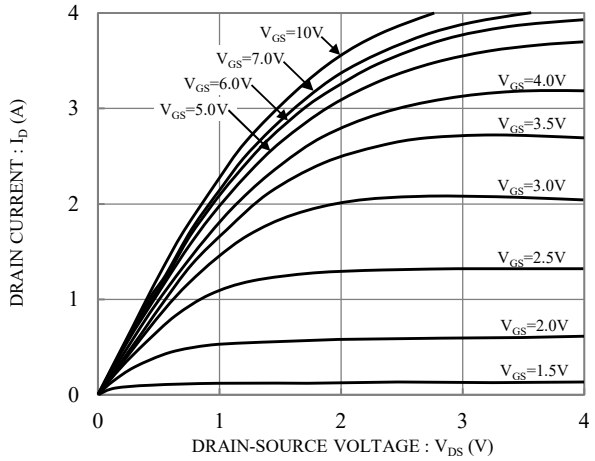


Fig.1 Typical Output Characteristics

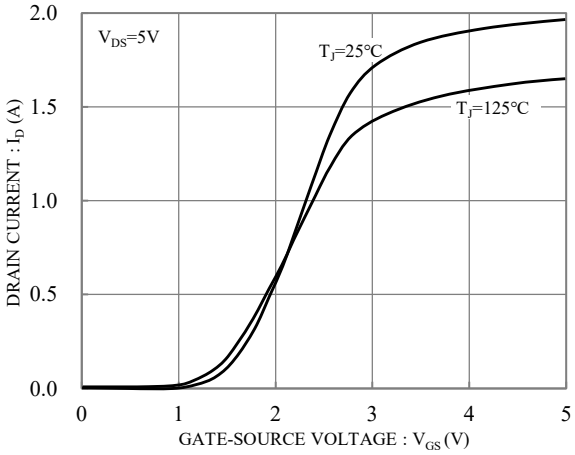


Fig.2 Typical Transfer Characteristics

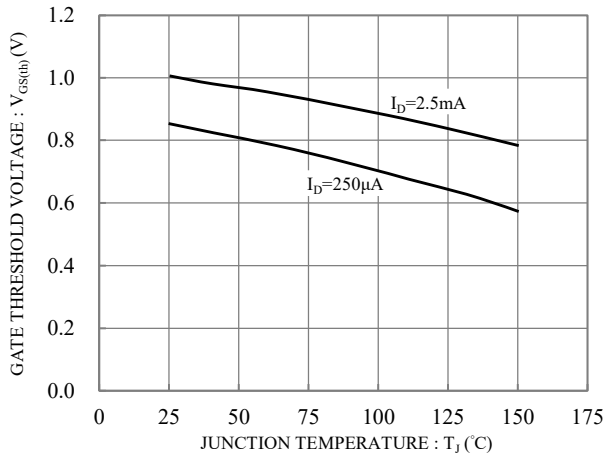


Fig.3 Gate Threshold Voltage vs. Junction Temperature

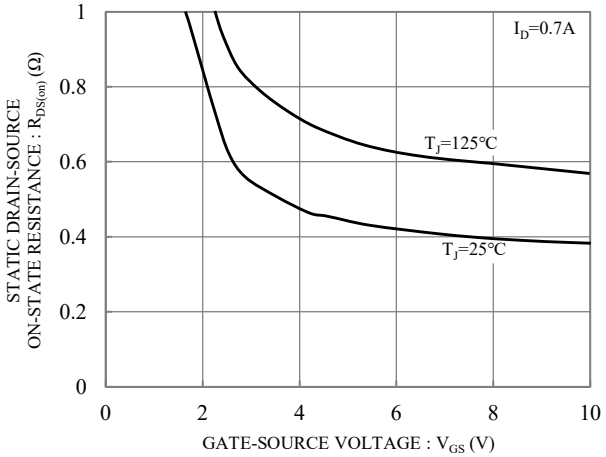


Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

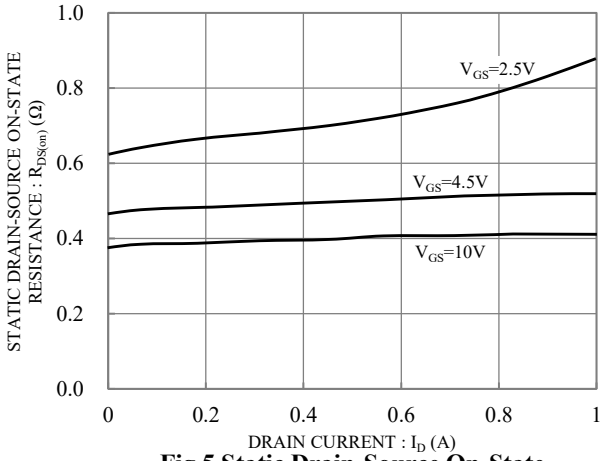


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

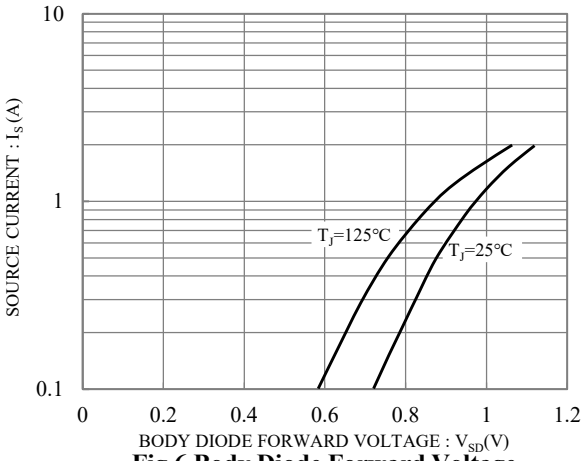


Fig.6 Body Diode Forward Voltage vs. Source Current

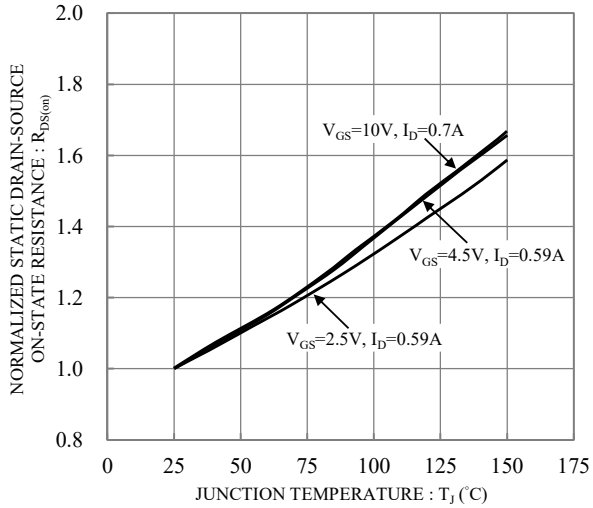


Fig.7 Drain-Source On-State Resistance vs. Junction Tempearture

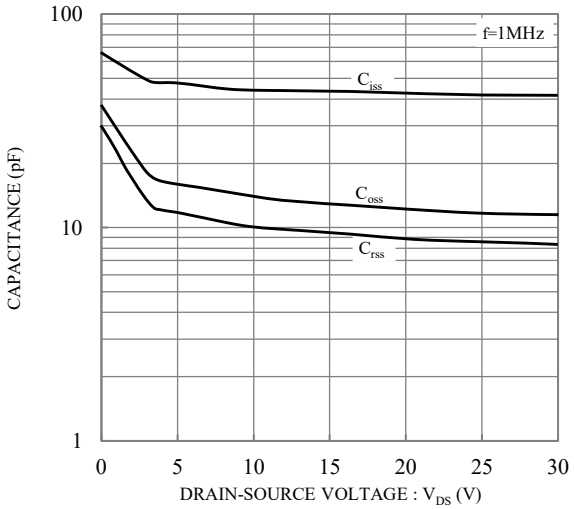


Fig.8 Capacitance vs. Drain-Source Voltage

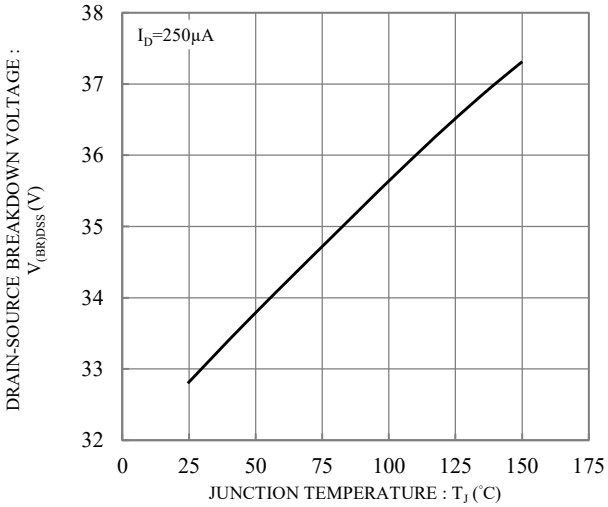


Fig.9 Breakdown Voltage vs. Junction Temperature

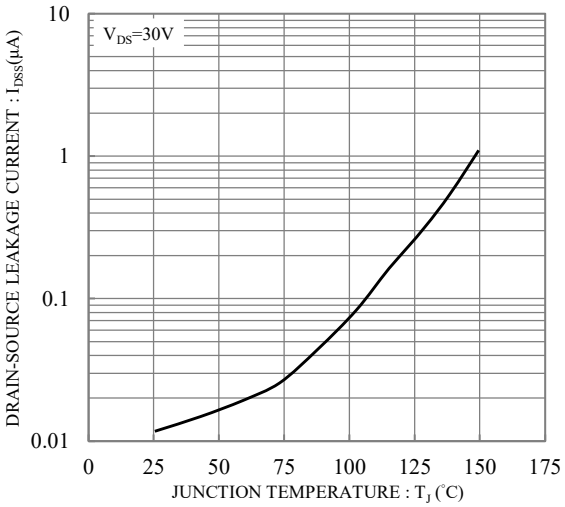


Fig.10 Drain-Source Leakge Current vs. Junction Temperature

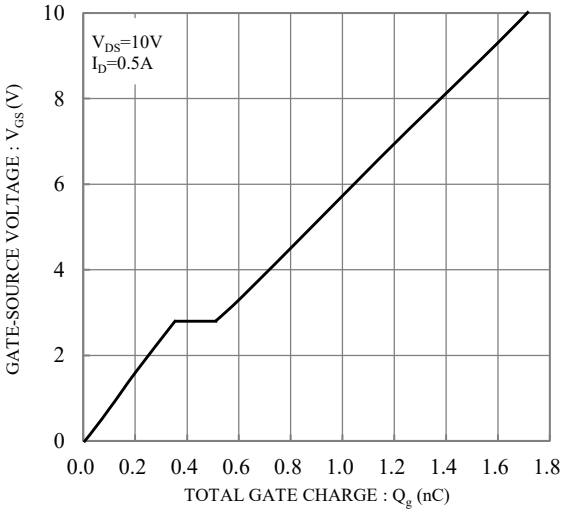
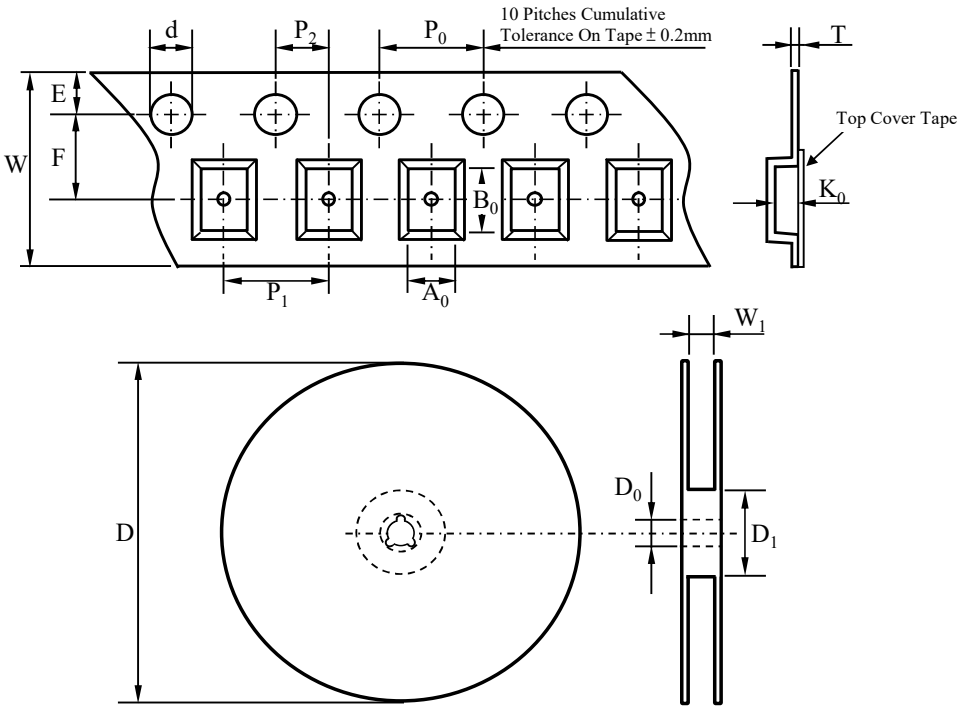


Fig.11 Gate Charge Characteristics

TAPE & REEL SPECIFICATION



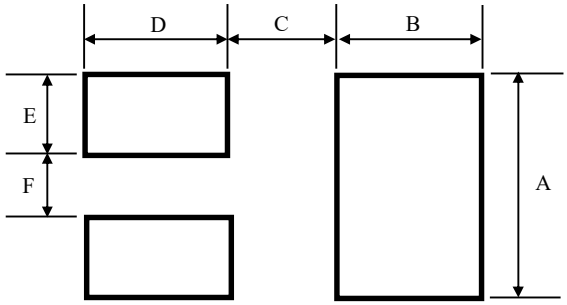
Item	Symbol	DFN1006-3
Carrier width	A_0	*
Carrier length	B_0	
Carrier depth	K_0	
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D_0	13.00 ± 0.50
Reel inner diameter	D_1	MIN. 54.00
Sprocke hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocke hole pitch	P_0	4.00 ± 0.10
Punch hole pitch	P_1	2.00 ± 0.10
Embossment center	P_2	2.00 ± 0.10
Overall tape thickness	T	MAX. 0.60
Tape width	W	8.00 ± 0.30
Reel width	W1	8.40 ± 1.50

Note *: A_0, B_0, and K_0 are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min. to 0.5 mm max.

ORDER INFORMATION

Part Number	Marking Code	Reel Size	Quantity
SM03N650KLPH	MS	7"	10,000

SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D	E	F
DFN1006-3	0.60	0.40	0.30	0.40	0.25	0.20