

SLM100N03G

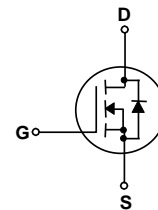
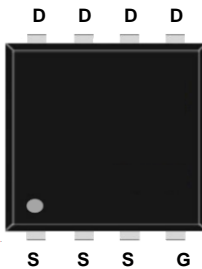
30V N-Channel MOSFET

General Description

This Power MOSFET is produced using Msemitek's advanced Shielding Gate MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for low voltage applications such as DC/DC converters and high efficiency switching for power management in portable and battery operated products.

Features

- N-Channel: 30V 100A
 - $R_{DS(on)Typ} = 1.4m\Omega @ V_{GS} = 10V$
 - $R_{DS(on)Typ} = 2.0m\Omega @ V_{GS} = 4.5V$
- Very Low On-resistance $R_{DS(on)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	SLM100N03G	Units
V_{DSS}	Drain-Source Voltage	30	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	100	A
		100	A
$I_{DM}^{1)}$	Drain Current - Pulsed	400	A
V_{GSS}	Gate-Source Voltage	± 20	V
$E_{AS}^{2)}$	Single Pulsed Avalanche Energy	168	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	108	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

R_{thJC}	Thermal Resistance, Junction to Case	Typ	1.15	$^\circ\text{C/W}$
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Package Marking

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
SLM100N03G	SLM100N03G	PDFN5X6	Tape & Reel	5000	50000

Electrical Characteristics

 $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0	--	2.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	--	1.4	1.9	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$	--	2.0	2.6	

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	--	2790	--	pF
C_{oss}	Output Capacitance		--	747	--	pF
C_{riss}	Reverse Transfer Capacitance		--	23	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{ V}, V_{DS} = 20\text{ V},$ $R_G = 2.2\ \Omega, I_D = 50\text{ A}$	--	11	--	ns
t_r	Turn-On Rise Time		--	12	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	47	--	ns
t_f	Turn-Off Fall Time		--	15	--	ns
Q_g	Total Gate Charge	$V_{DS} = 20\text{ V}, I_D = 20\text{ A},$ $V_{GS} = 10\text{ V}$	--	49.3	--	nC
Q_{gs}	Gate-Source Charge		--	6.4	--	nC
Q_{gd}	Gate-Drain Charge		--	10	--	nC
R_G	Gate Resistance	$f = 1\text{ MHz}$	--	3	--	Ω

Drain-Source Diode Characteristics

I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	100	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	400	A
V_{SD}	Drain to Source Diode Forward Voltage, $V_{GS} = 0\text{ V}, I_{SD} = 20\text{ A}, T_J = 25^\circ\text{C}$	--	0.8	--	V

Notes:

1. Repetitive rating: pulse width limited by maximum junction temperature.
2. EAS condition: $T_J = 25^\circ\text{C}, V_{DD} = 50\text{ V}, V_G = 10\text{ V}, L = 0.5\text{ mH}$.
3. These curves are based on the junction-to-case thermal impedance $R_{th(jc)}$, assuming maximum junction temperature is 150°C . These curves provide a single pulse rating.

N- Channel Typical Characteristics

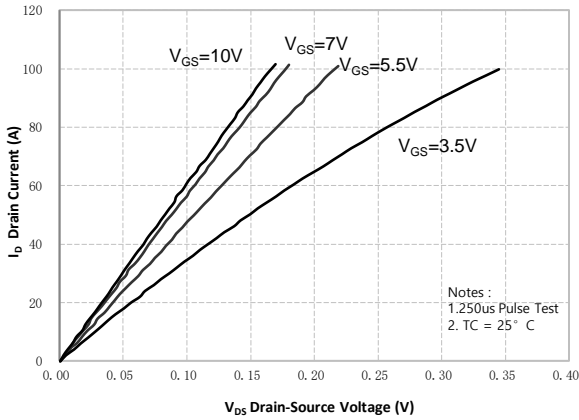


Figure 1. On-Region Characteristics

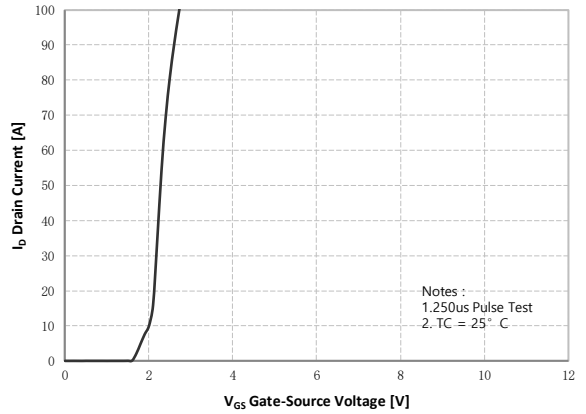


Figure 2. Transfer Characteristics

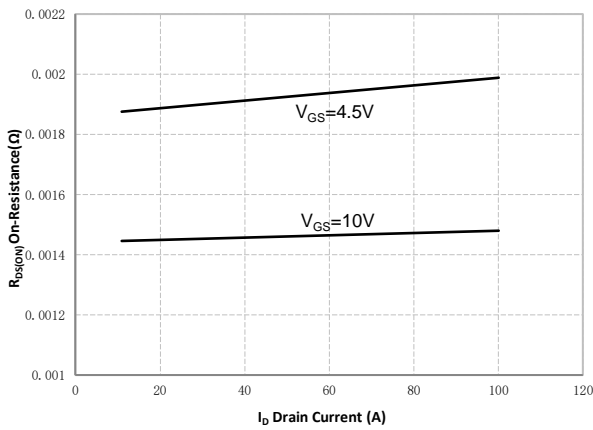


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

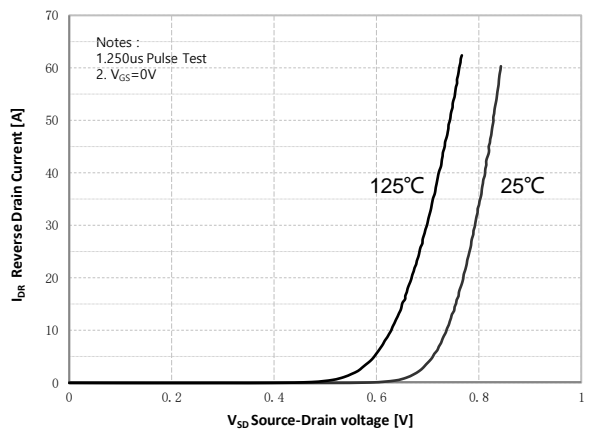


Figure 4. Body Diode Forward Voltage Variation with Source Current

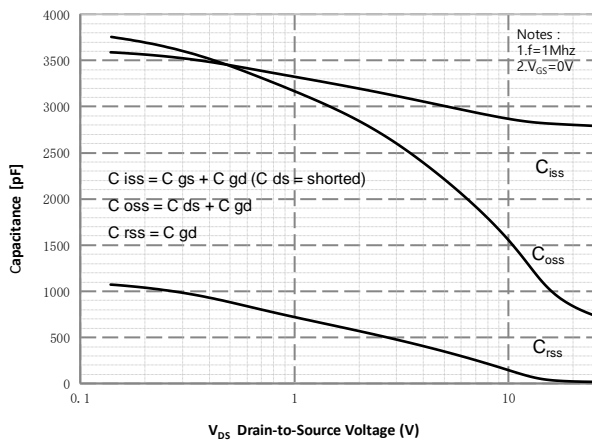


Figure 5. Capacitance Characteristics

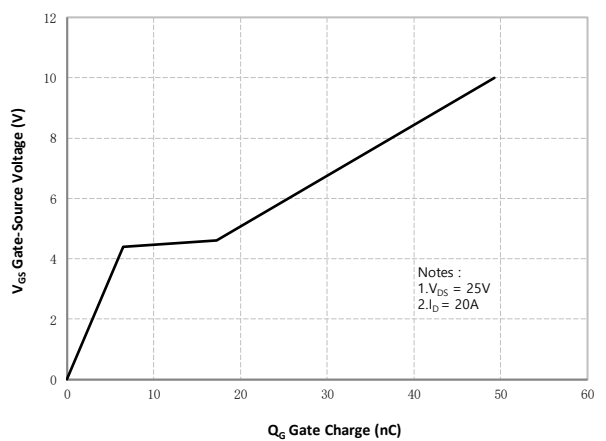


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

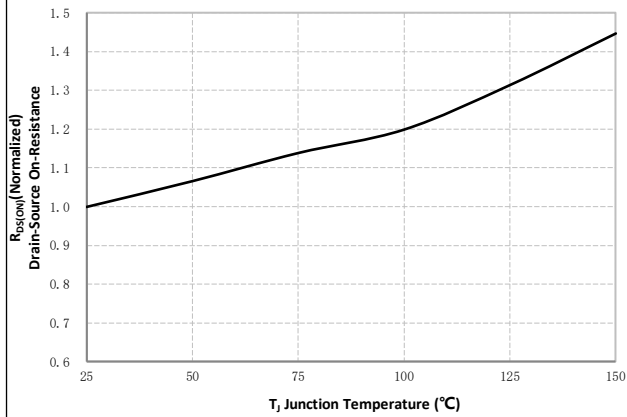


Figure 7. On-Resistance Variation vs Temperature

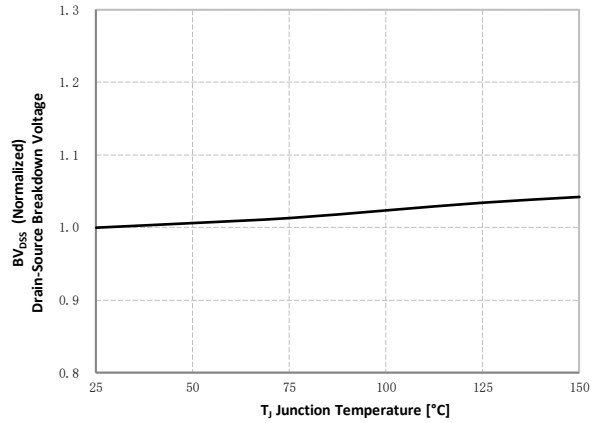


Figure 8. Breakdown Voltage Variation vs Temperature

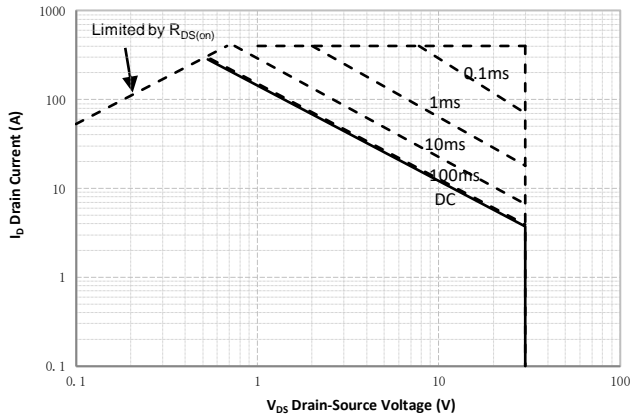


Figure 9. Maximum Safe Operating Area ³⁾

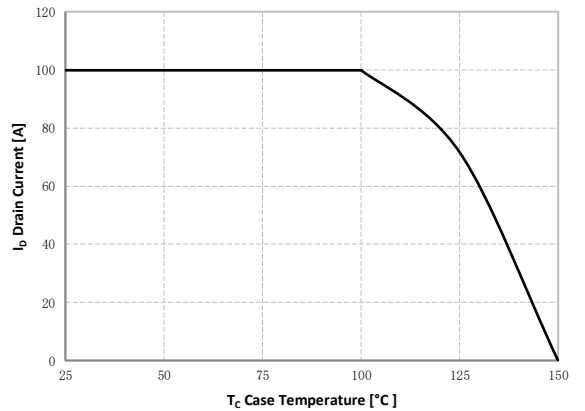


Figure 10. Maximum Continuous Drain Current vs Case Temperature

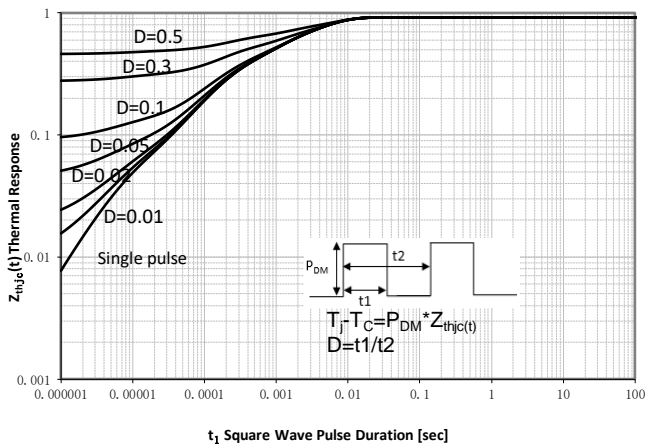
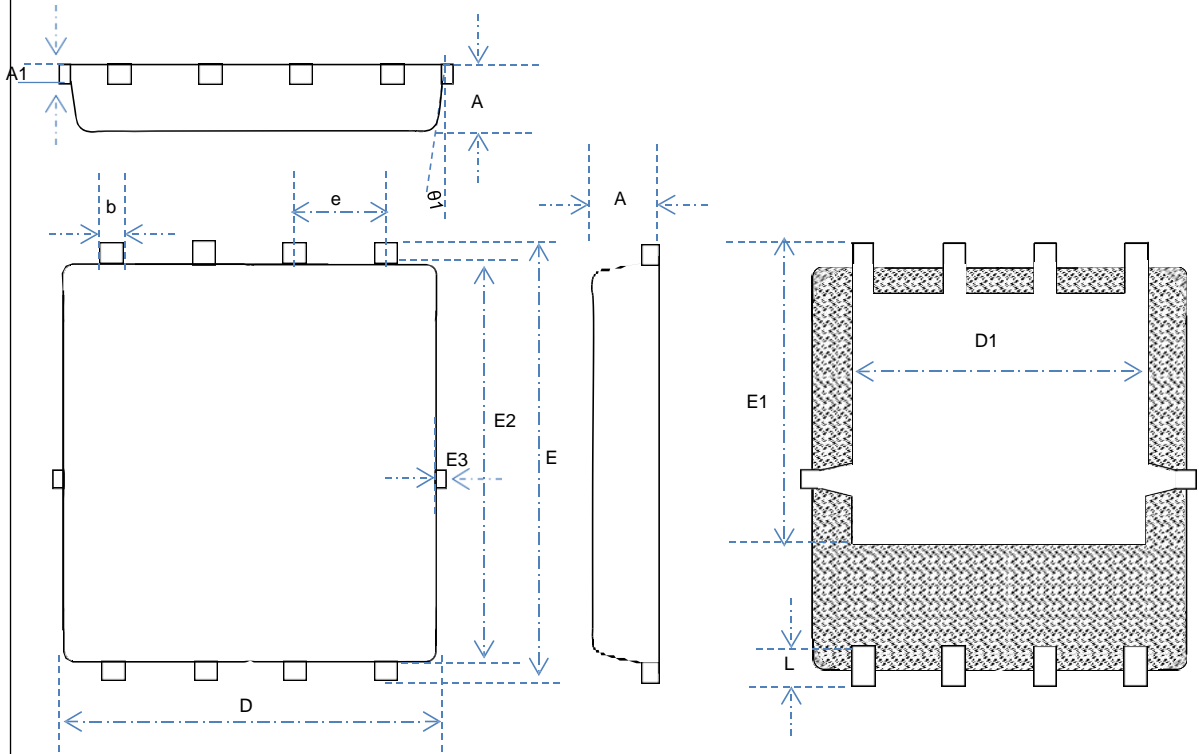


Figure 11. Transient Thermal Response Curve

PDFN5X6 OUTLINE



SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.90	1.05	1.20	D	4.95	5.15	5.35
A1	0.254 REF			e	1.270 TYP		
b	0.25	0.35	0.45	D1	3.80	4.00	4.20
E	5.90	6.10	6.30	L	0.54	0.64	0.74
E1	3.90	4.20	4.50				
E2	5.50	5.70	5.90	θ1	8°	10°	12°
E3	-	-	0.15				

NAME	PDFN 5X6 OUTLINE	UNIT	mm	DESIGNED	lang hu	THIRD ANGLE SYSTEM
DWGNO		PAGE	1 OF 1	CHECKED		
VERSION	Ver2.0	ISSUE DATE		APPROVED		

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