GOSTONE

RoHS COMPLIANT

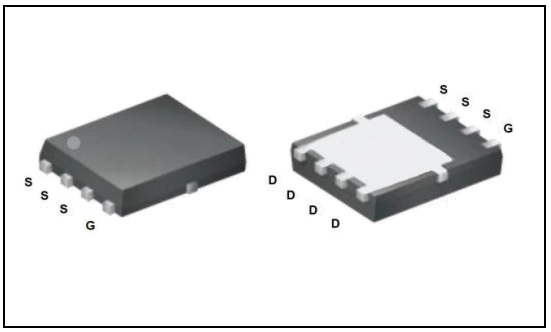
N-Channel 40V,1.4mΩ max,SGT Power MOSFET

GMS015N04F1

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
40	1.4@ V_{GS} = 10V	190 (1)

PDFN5060

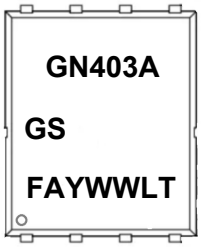


Features

- Low RDS(on) SGT technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

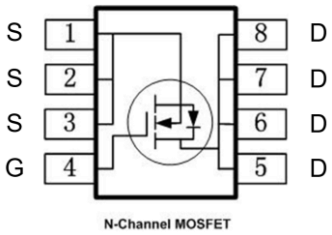
- Power management
- SMPS and general purpose applications
- Uninterruptible Power Supply
- Load Switch



PDFN5060

NOTE:
LOGO - GS
GN403A- Part number
code F - Fab location code
A - Assembly location code
Y - Year code
WW - Week code
L&T - Assembly lot code

Equivalent circuit



Absolute maximum rating@25℃

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25℃(1)	I_D	190	A
Pulsed drain current(2)		$I_{D,pulse}$	760	
Avalanche energy, single pulse(3)		E_{AS}	677	mJ
Power dissipation	T_C=25℃	P_D	100	W
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	℃

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	1.25	℃/W
Thermal resistance, junction-to-ambient (4)	Steady state	$R_{\theta JA}$	58	

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0, I_D = 250 μA	40			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1.2	1.45	2.4	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V			1	μA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A		1.08	1.4	mΩ
		V_{GS} = 4.5 V, I_D = 20 A		1.3	1.8	mΩ
Forward transconductance (5)	g_{fs}	V_{DS} = 5 V, I_D = 30 A		54		S
Gate resistance	R_g	f = 1 MHz		2.5		Ω
Dynamic(5)						
Total gate charge V_{GS} = 10V	Q_g	V_{DS} = 20 V, I_D = 20 A, V_{GS} = 10 V		69		nC
Total gate charge V_{GS} = 6.0V	Q_g			34		
Gate-source charge	Q_{gs}			14.6		
Gate-drain charge	Q_{gd}			14.5		
Turn-on delay time	$t_{d(on)}$	V_{DS} = 20 V, R_L = 0.4 Ω, V_{GS} = 10 V, R_{GEN} = 2.5 Ω		4.4		ns
Rise time	t_r			19.8		
Turn-off delay time	$t_{d(off)}$			76		
Fall time	t_f			73.7		
Input capacitance	C_{iss}	V_{DS} = 20 V, V_{GS} = 0 V, f = 100K Hz		5205		pF
Output capacitance	C_{oss}			1755		
Reverse transfer capacitance	C_{rss}			60		
Reverse Diode Characteristics (5)						
Diode forward voltage	V_{SD}	V_{GS} = 0 V, I_F = 2 A		0.8	1.2	V
Reverse recovery time	t_{rr}	I_F = 20 A, di/dt = 100 A/μs		138		ns
Reverse recovery charge	Q_{rr}			427		nC

Notes

(1) Limited by maximum junction temperature.

(2) Pulse width limited by maximum junction temperature.

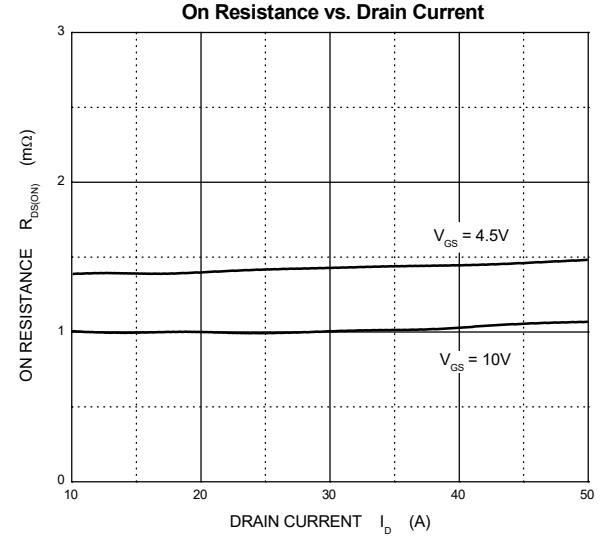
(3) V_{DS} = 20 V, V_{GS} = 10 V, L = 0.5 mH.

(4) Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.

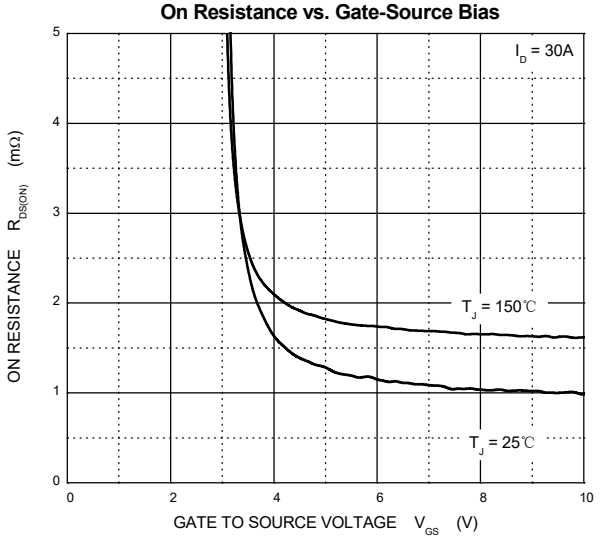
(5) Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

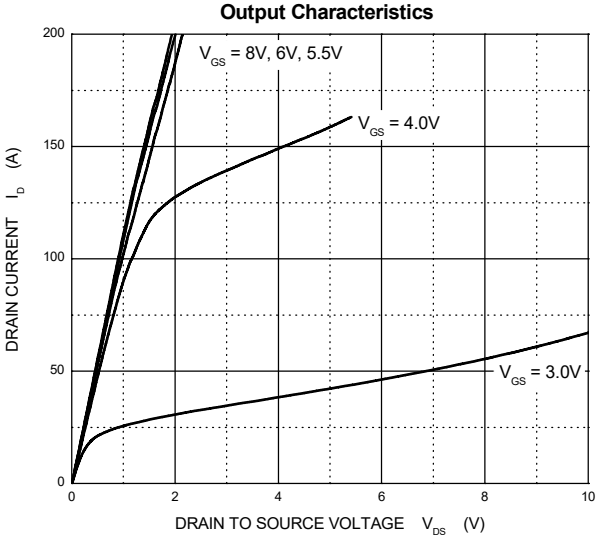
On Resistance vs. Drain Current



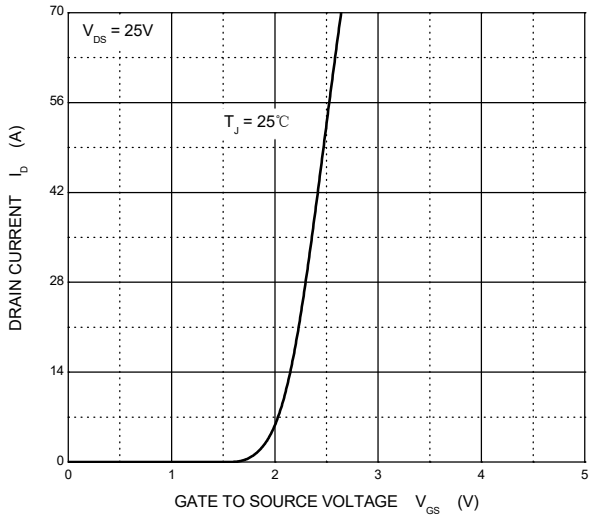
On Resistance vs. Gate-Source Bias



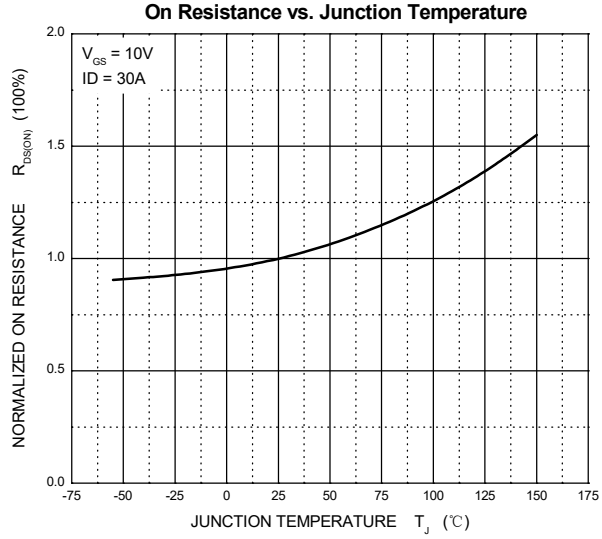
Output Characteristics



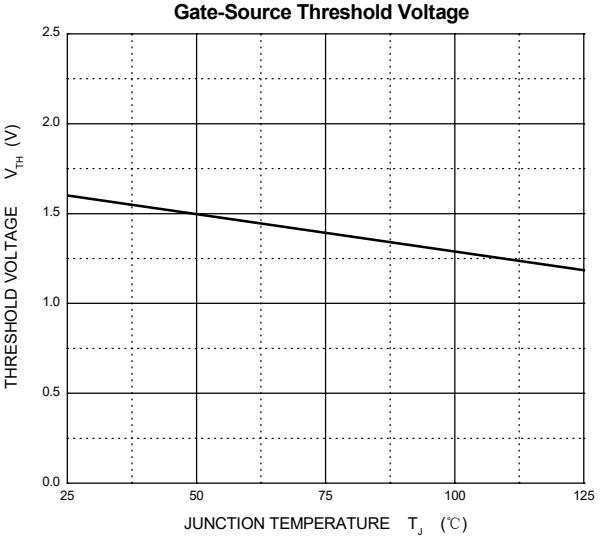
Transfer Characteristics



On Resistance vs. Junction Temperature

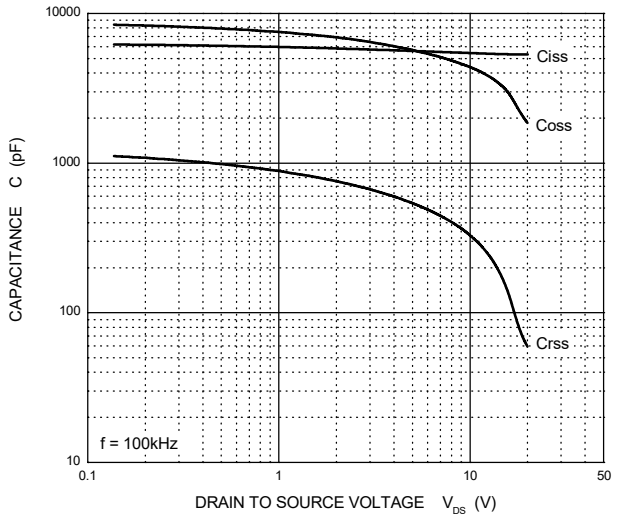


Gate-Source Threshold Voltage

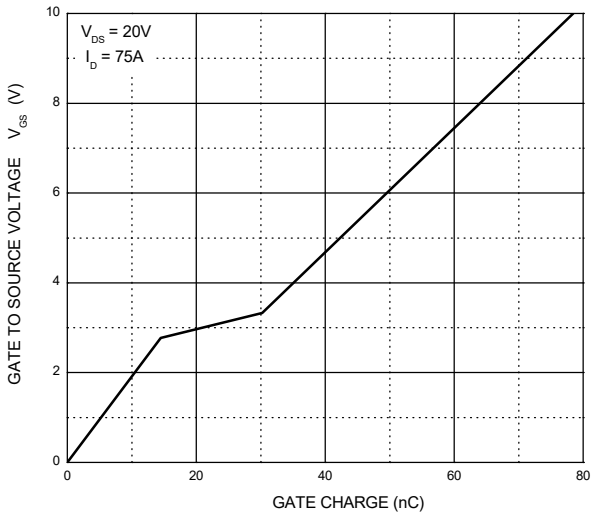


Typical Performance Characteristics

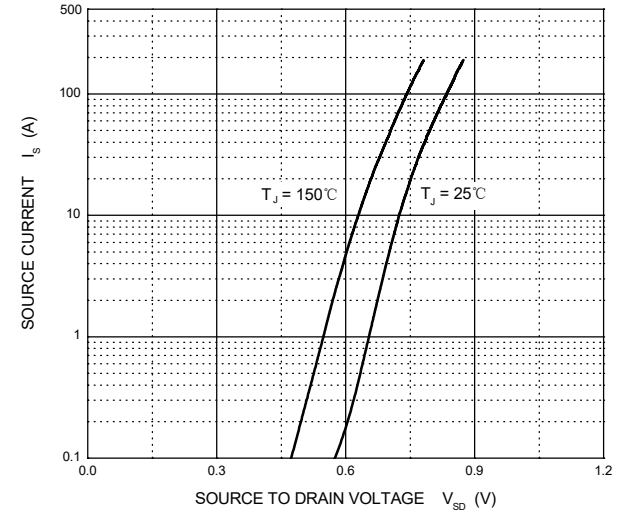
Typical Capacitances



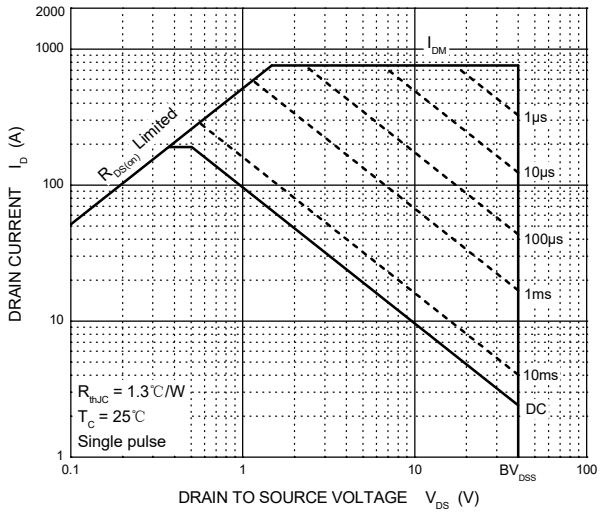
Gate Charge



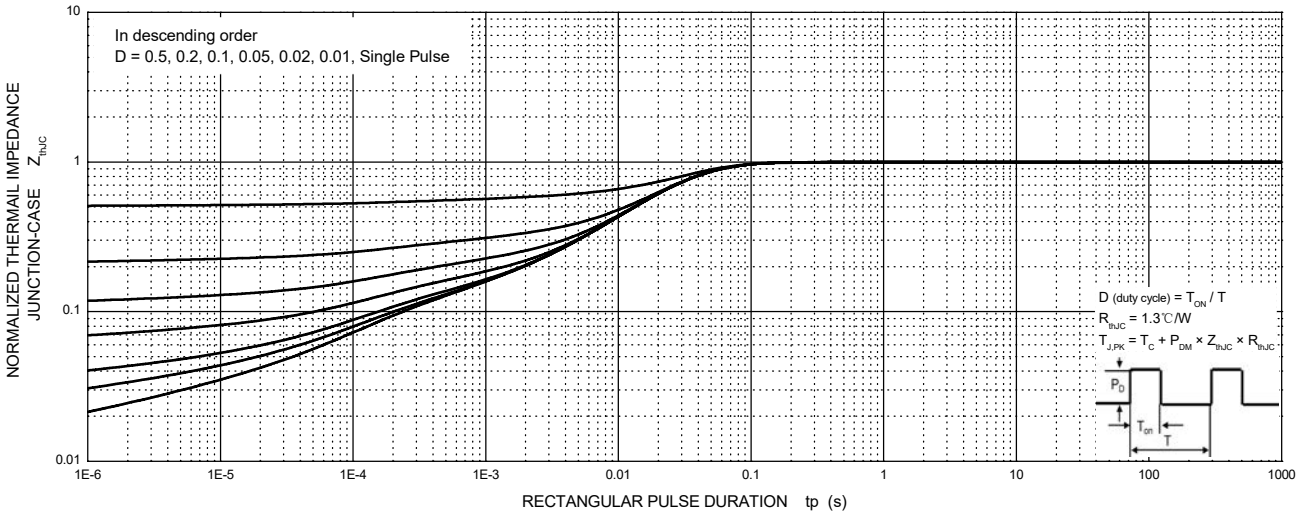
Source-Drain Diode Forward Characteristics



Maximum Safe Operating Area

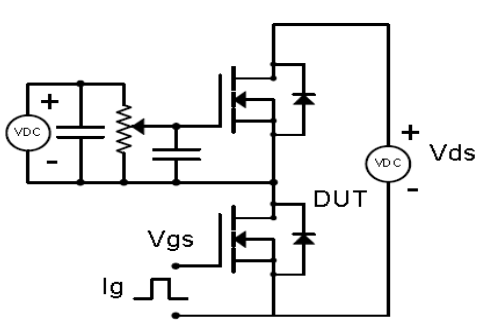


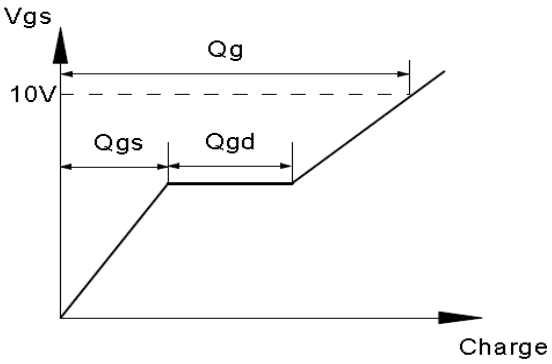
Transient Thermal Impedance, Junction-Case



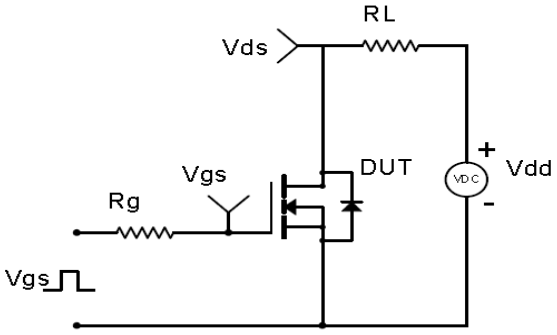
Test Circuit & Waveform

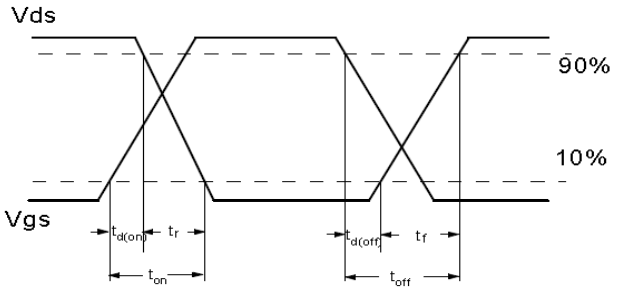
Gate Charge Test Circuit & Waveform



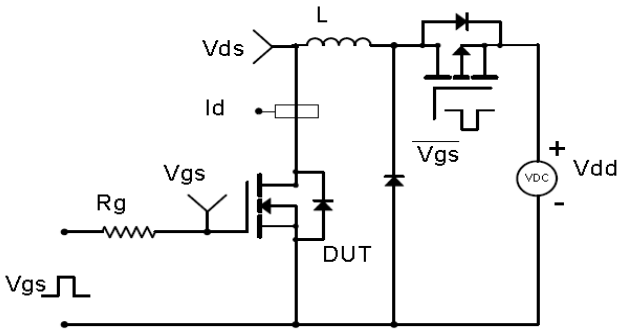


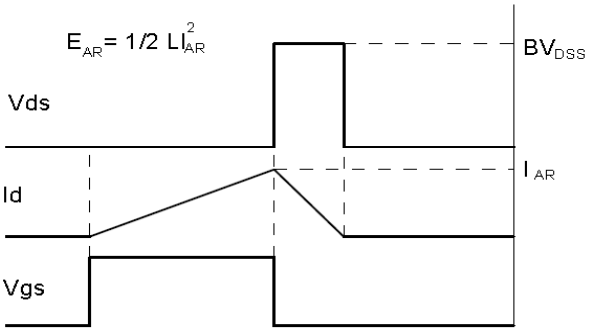
Resistive Switching Test Circuit & Waveforms



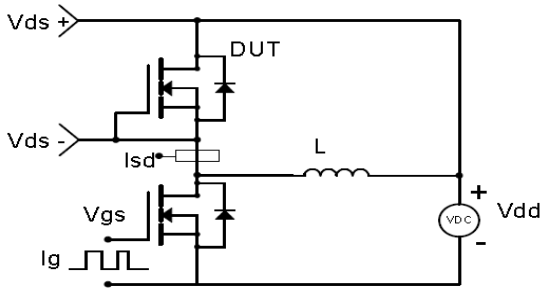


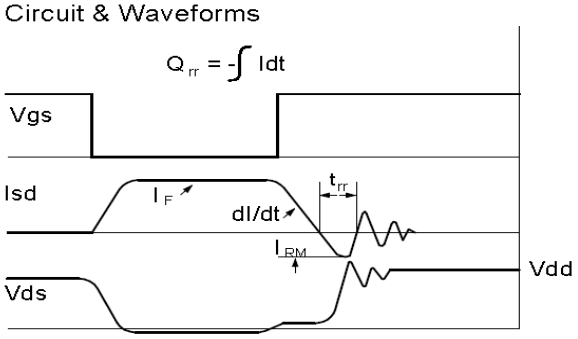
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



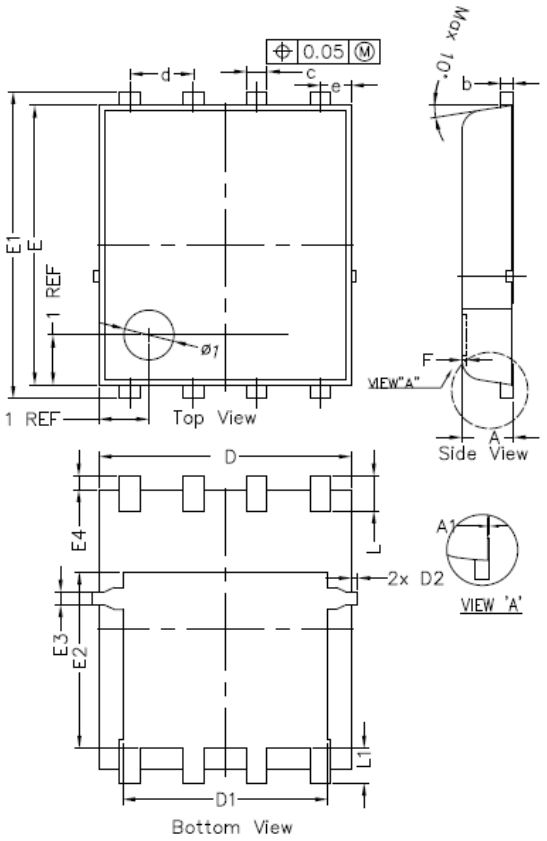


Diode Recovery Test Circuit & Waveforms





Outline Drawing PDFN5060



Dim	Millimeters		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	---	0.050
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d		1.27BSC	
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
D2	---	---	0.125
e		0.62BSC	
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.150	0.250	0.350
E4	0.175	0.275	0.375
F	---	---	0.100
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

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