GOSTONE

RoHS COMPLIANT

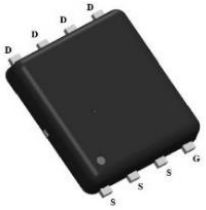
N-Channel 150V,60mΩ max, SGT Power MOSFET

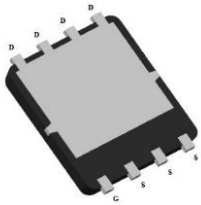
GMS600N15F

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
150	60@ V_{GS} = 10V	20.2

View and Internal Schematic Diagram

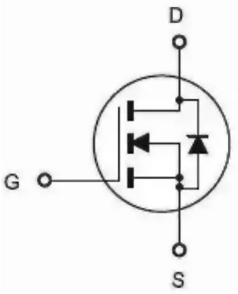




PDFN3333

NOTE:
LOGO - GS
GMS600N15F Part number code
F - Fab location code
A - Assembly location code
Y - Year code
WW - Week code
L&T - Assembly lot code

Equivalent circuit



Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

- Primary side switch
- Synchronous rectification
- DC/DC conversion
- Load switching
- Boost converters
- DC/AC inverters

Absolute maximum rating@25℃

PARAMETER		SYMBOL	LIM	UNIT
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	T_C = 25 °C	I_D	15	A
	T_C = 70 °C		12	
Pulsed Drain Current (t = 300 μs)		I_{DM}	50	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	5	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	52	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C
Soldering Recommendations (Peak Temperature) [c,d]			260	

Thermal Characteristic

PARAMETER		SY BOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient	t ≤ 10 s	R_{thJA}	26	33	°C/W
Maximum Junction-to-Case	Steady State	R_{thJC}	1.9	2.4	

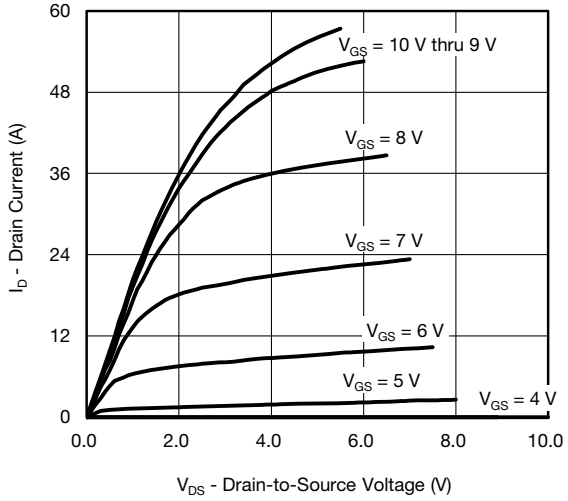
Electrical Characteristics (TJ=25℃ unless otherwise noted)

PARAMETER	S MBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	150			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA		97		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			-6.9		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	3		4.2	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 150 V, V_{GS} = 0 V			1	µA
		V_{DS} = 150 V, V_{GS} = 0 V, T_J = 55 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A		57	60	mΩ
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 10 A		11		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 75 V, V_{GS} = 0 V, f = 1 MHz		420		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			16		
Total Gate Charge	Q_g	V_{DS} = 75 V, V_{GS} = 10 V, I_D = 10 A		9.5	14.5	nC
		V_{DS} = 75 V, V_{GS} = 7.5 V, I_D = 10 A		7.6	11.5	
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			3.6		
Output Charge	Q_{oss}	V_{DS} = 75 V, V_{GS} = 0 V		23.6	36	
Gate Resistance	R_g	f = 1 MHz		4.3		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 75 V, R_L = 7.5 Ω I_D ≅ 10 A, V_{GEN} = 7.5 V, R_g = 1 Ω		13	26	ns
Rise Time	t_r			11	22	
Turn-Off Delay Time	$t_{d(off)}$			14	28	
Fall Time	t_f			9	18	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 75 V, R_L = 7.5 Ω I_D ≅ 10 A, V_{GEN} = 10 V, R_g = 1 Ω		12	24	
Rise Time	t_r			8	6	
Turn-Off Delay Time	$t_{d(off)}$			13	26	
Fall Time	t_f			8	16	
Drain-Source Body Diode Characteristics						
Body Diode Voltage	V_{SD}	I_S = 4 A, V_{GS} = 0 V		0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 10 A, dI/dt = 100 A/µs, T_J = 25 °C		94	180	ns
Body Diode Reverse Recovery Charge	Q_{rr}			190	380	nC
Reverse Recovery Fall Time	t_a			35		ns
Reverse Recovery Rise Time	t_b			59		

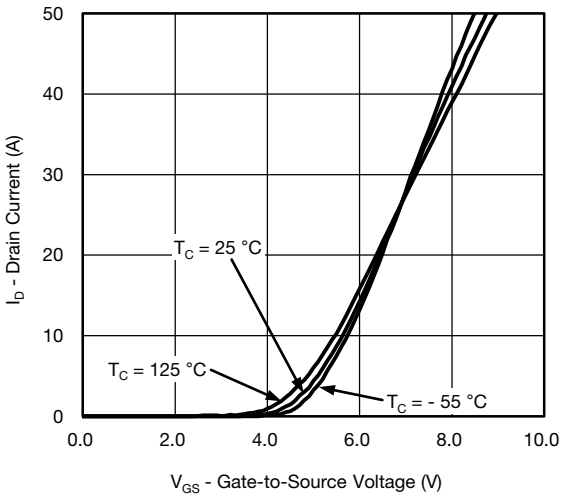
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

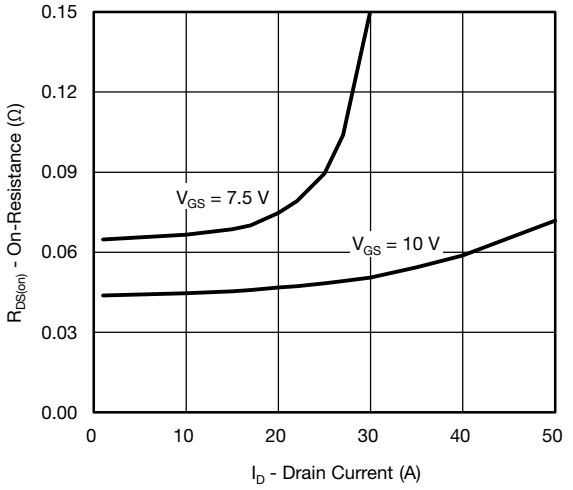
Typical Performance Characteristics



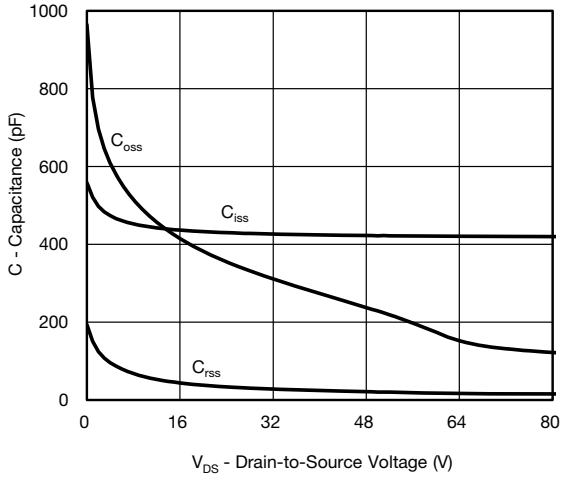
Output Characteristics



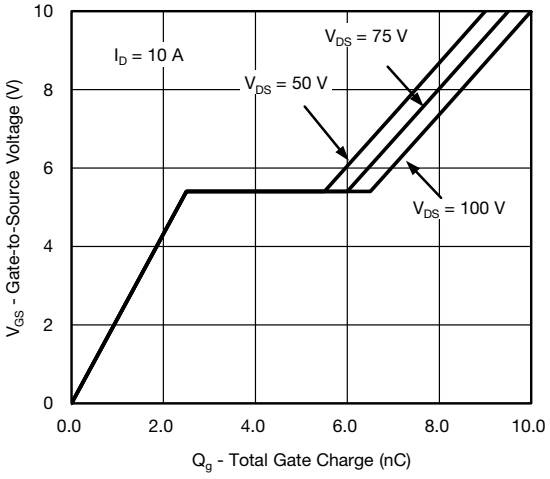
Transfer Characteristics



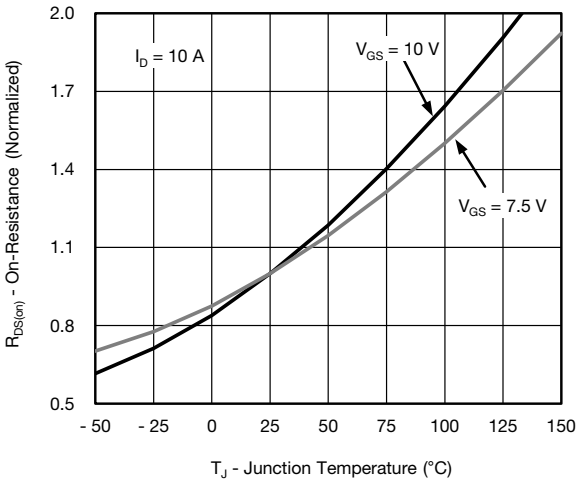
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

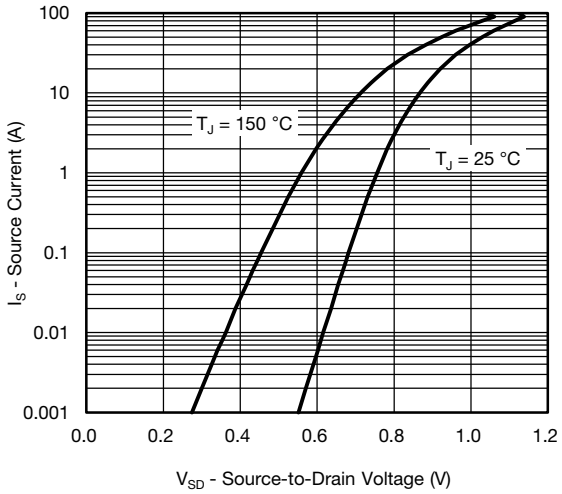


Gate Charge

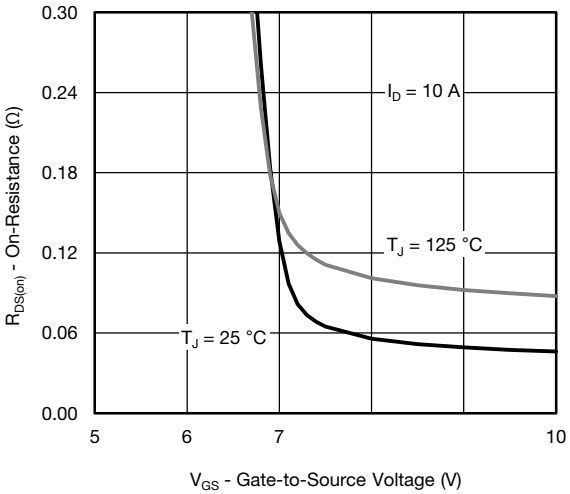


On-Resistance vs. Junction Temperature

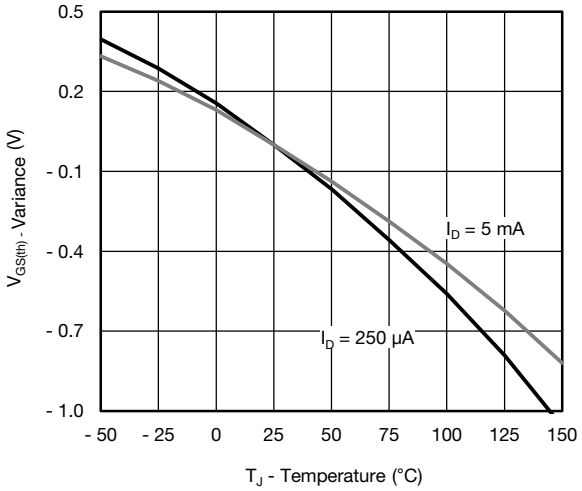
Typical Performance Characteristics



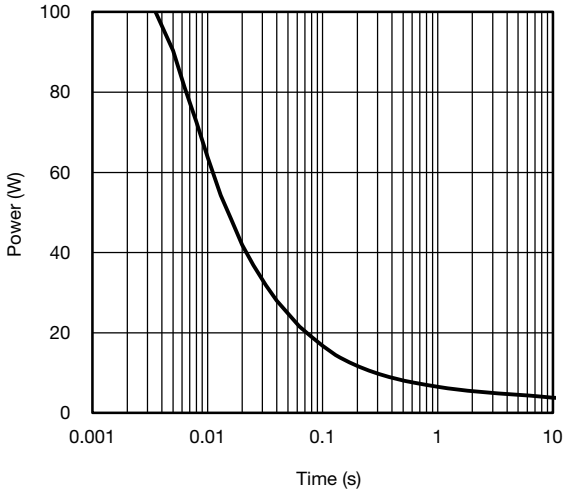
Source-Drain Diode Forward Voltage



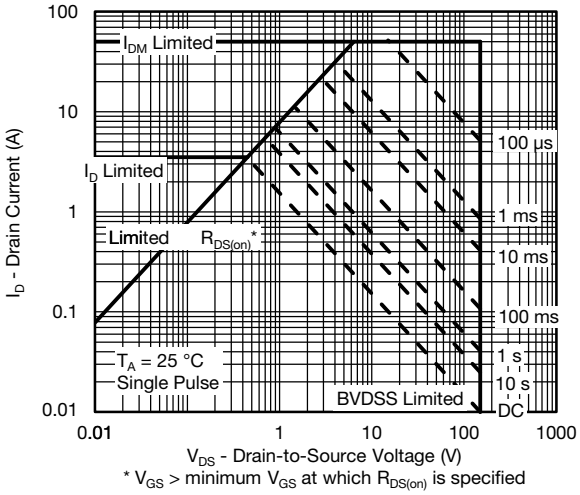
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

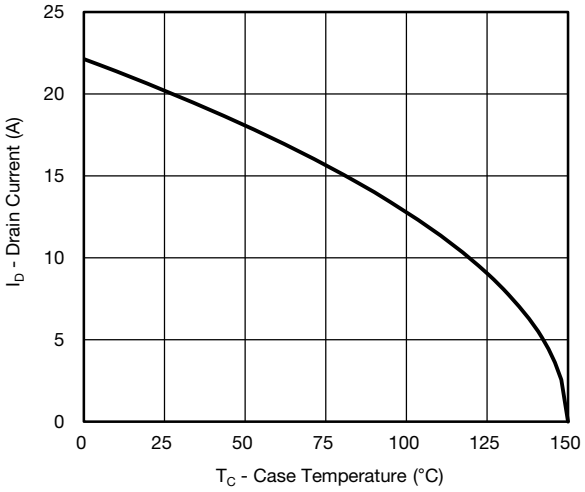


Single Pulse Power, Junction-to-Ambient

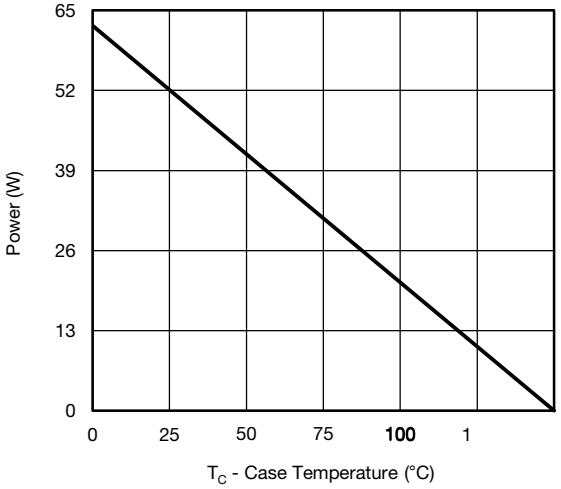


Safe Operating Area, Junction-to-Ambient

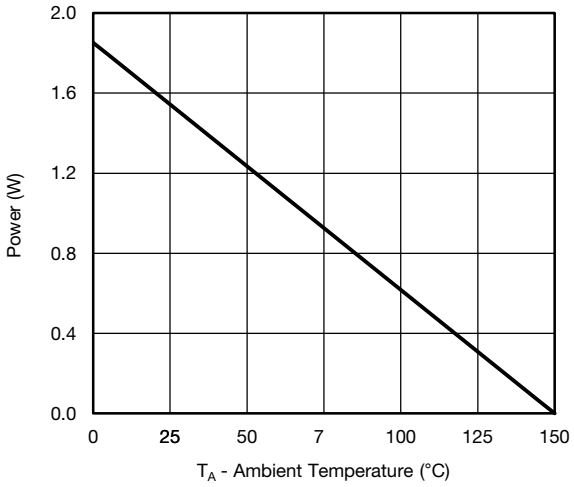
Typical Performance Characteristics



Current Derating*



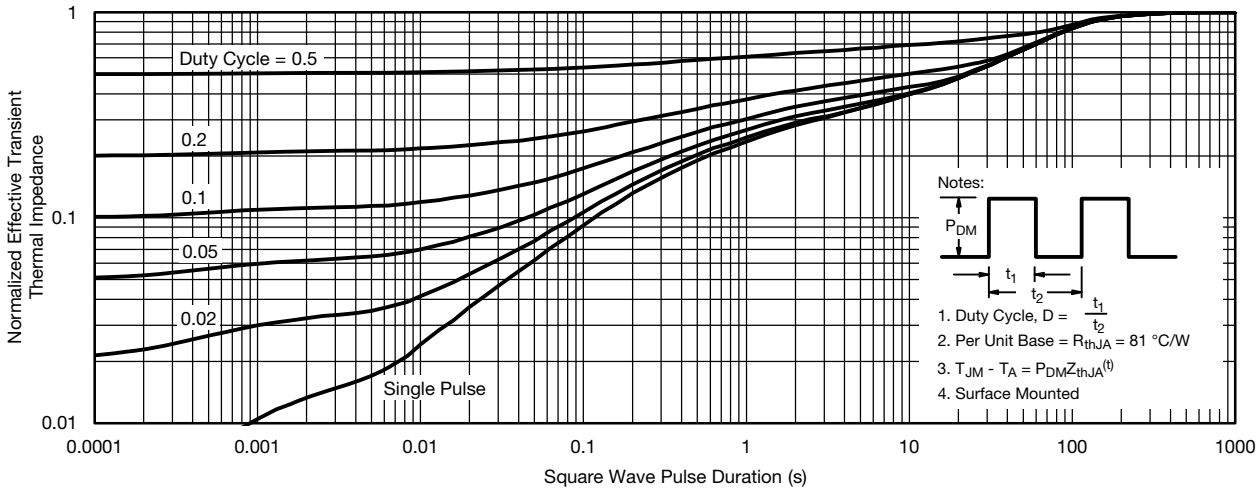
Power, Junction-to-Case



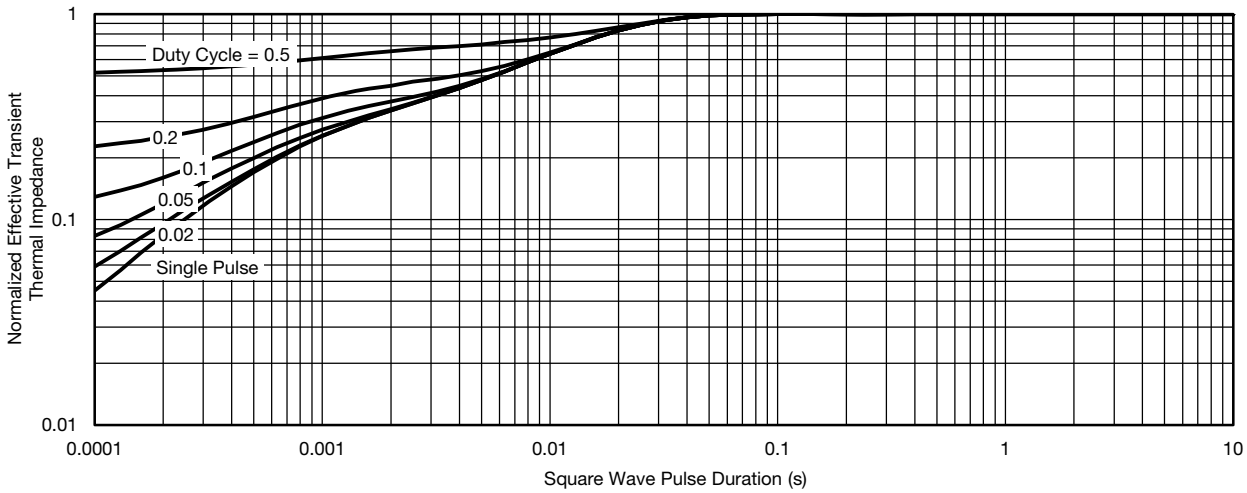
Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

Typical Performance Characteristics



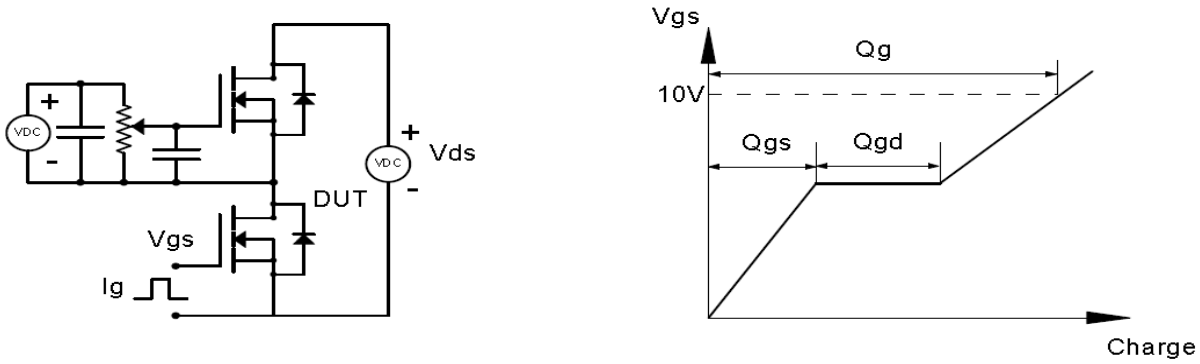
Normalized Thermal Transient Impedance, Junction-to-Ambient



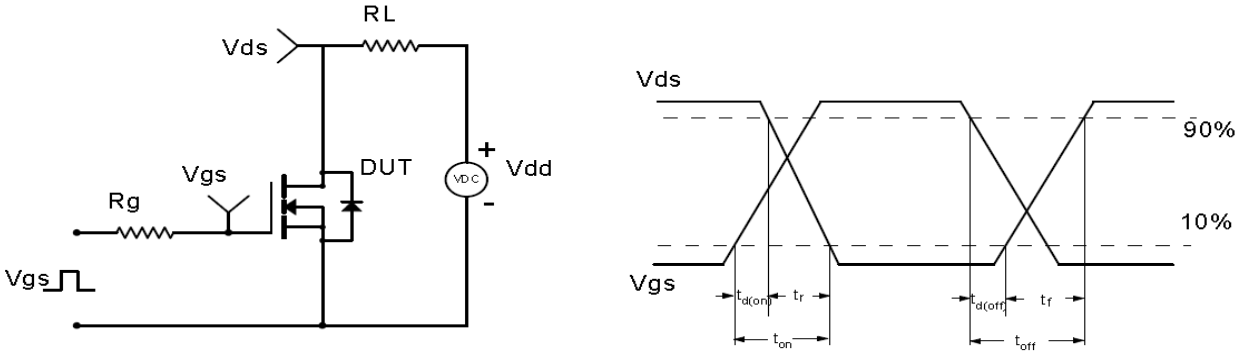
Normalized Thermal Transient Impedance, Junction-to-Case

Test Circuit & Waveform

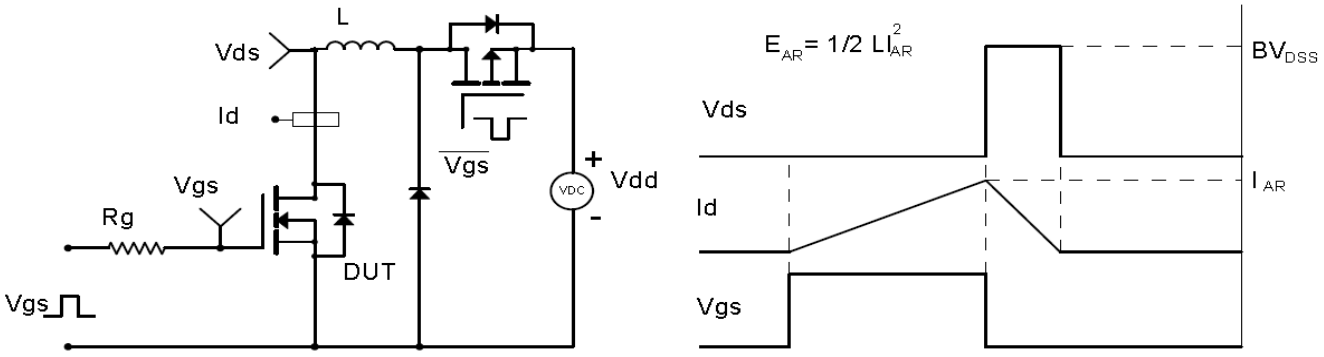
Gate Charge Test Circuit & Waveform



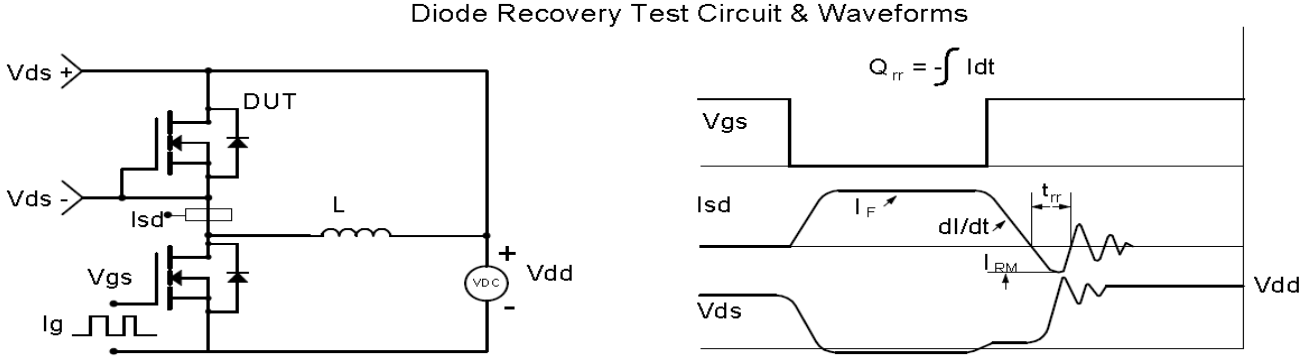
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

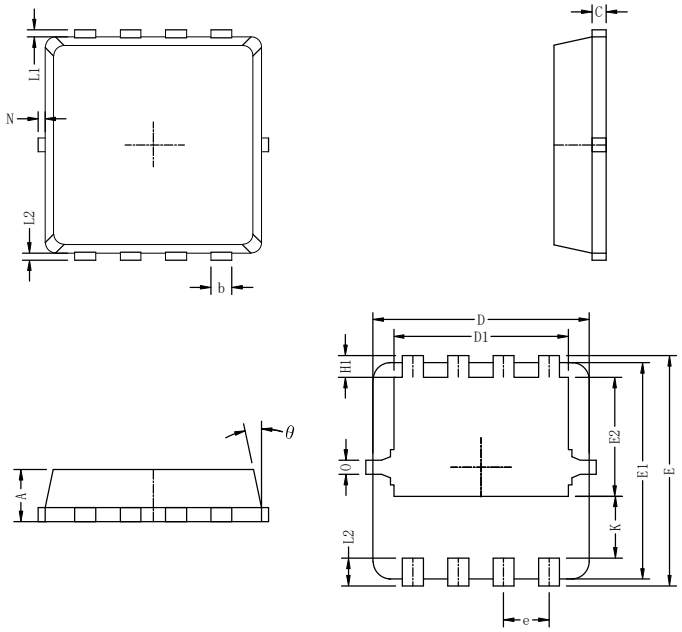


Diode Recovery Test Circuit & Waveforms



Outline Drawing PDFN3333

Package Outline: PDFN3333



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
O	0.2 REF.		

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