40V N-Ch Power MOSFET

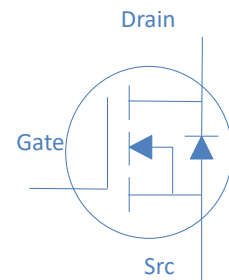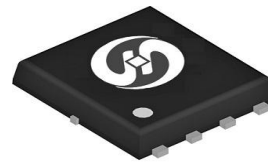| V_{DS}		40	V
$R_{DS(on),typ}$	V_{GS}=10V	3.2	mΩ
$R_{DS(on),typ}$	V_{GS}=6V	7.4	mΩ
$I_{D\,(Silicon\ Limited)}$		95	A

Feature
◇ Optimized for high speed switching
◇ Enhanced Body diode dv/dt capability
◇ Enhanced Avalanche Ruggedness
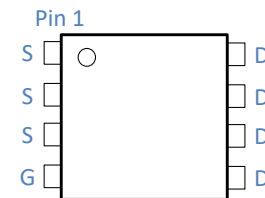◇ 100% UIS Tested, 100% Rg Tested
◇ Lead Free, Halogen Free

Application
◇ Synchronous Rectification in SMPS
◇ Hard Switching and High Speed Circuit
◇ Power Tools
◇ UPS
◇ Motor Control

DFN5x6

Part Number	Package	Marking
HTN035N04P	DFN5x6	TN035N04P

Drain

Gate

Src

Pin 1

S	D
S	D
S	D
G	D

Absolute Maximum Ratings at T_j=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	T_C=25℃	95	A
		T_C=100℃	60	
Drain to Source Voltage	V_{DS}	-	40	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	141	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.1mH, T_C=25℃	11.25	mJ
Power Dissipation	P_D	T_C=25℃	50	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.5	℃/W
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	℃/W

Electrical Characteristics at T_j=25℃ (unless otherwise specified)

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250µA	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250µA	2	2.8	4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=32V, T_j=25℃	-	-	1	µA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	3.2	3.8	mΩ
		V_{GS}=6V, I_D=15A	-	7.4	-	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=18A	-	20	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	2.90	-	Ω

Dynamic Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	-	3183	-	pF
Output Capacitance	C_{oss}		-	305	-	
Reverse Transfer Capacitance	C_{rss}		-	183	-	
Total Gate Charge (10V)	Q_g (10V)	V_{DD}=25V, I_D=14A, V_{GS}=10V	-	53.4	-	nC
Total Gate Charge (4.5V)	Q_g (4.5V)		-	27.6	-	
Gate to Source Charge	Q_{gs}		-	11.8	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	16.3	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=15V, I_D=1A, V_{GS}=10V, R_G=1Ω,	-	28	-	ns
Rise time	t_r		-	21	-	
Turn off Delay Time	$t_{d(off)}$		-	38	-	
Fall Time	t_f		-	19	-	

Reverse Diode Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=15A	-	0.8	1.1	V
Reverse Recovery Time	t_{rr}	I_F=15A, dI_F/dt=100A/µs	-	19.1	-	ns
Reverse Recovery Charge	Q_{rr}		-	10.4	-	nC

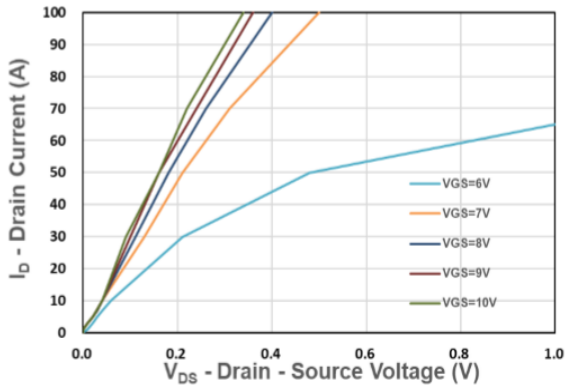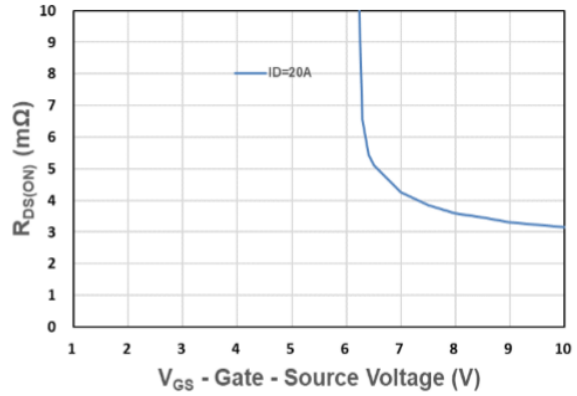| Fig 1. Typical Output Characteristics	Figure 2. On-Resistance vs. Gate-Source Voltage

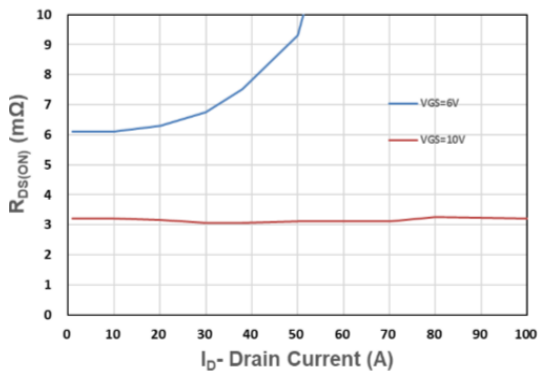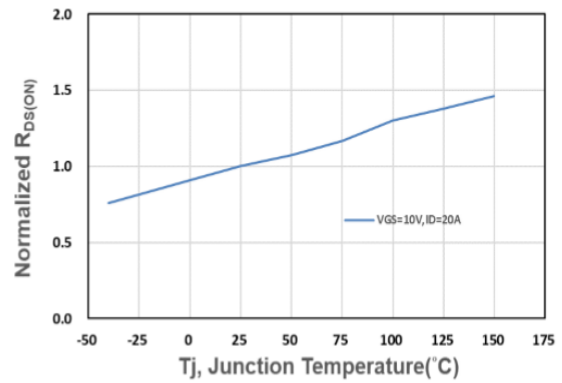| Figure 3. On-Resistance vs. Drain Current and Gate Voltage	Figure 4. Normalized On-Resistance vs. Junction Temperature

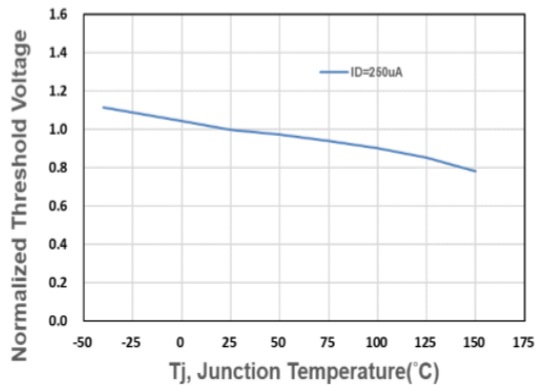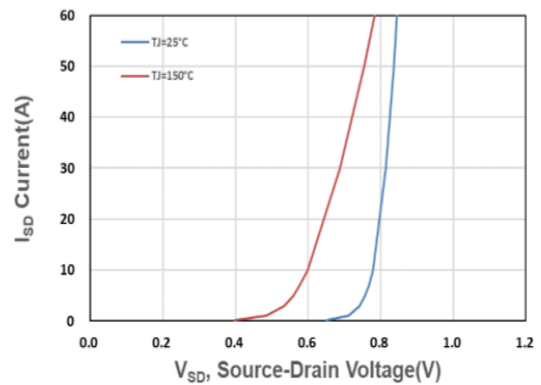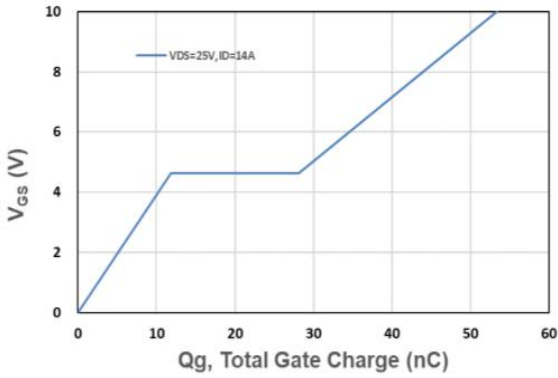| Figure 5. Normalized Threshold Voltage vs. Junction Temperature	Figure 6. Typical Source-Drain Diode Forward Voltage

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage
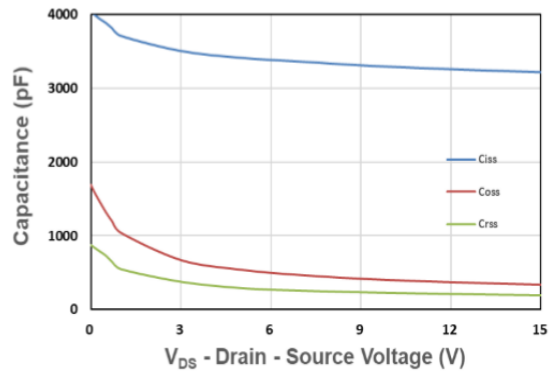

Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

Figure 9. Maximum Safe Operating Area
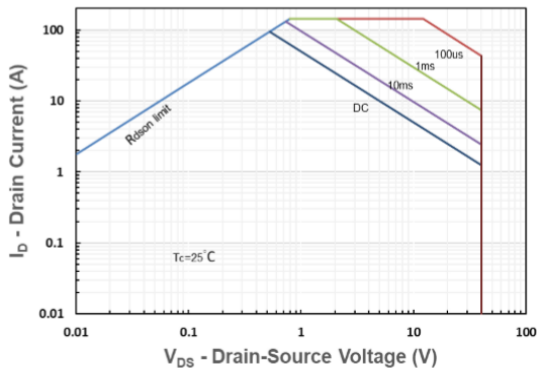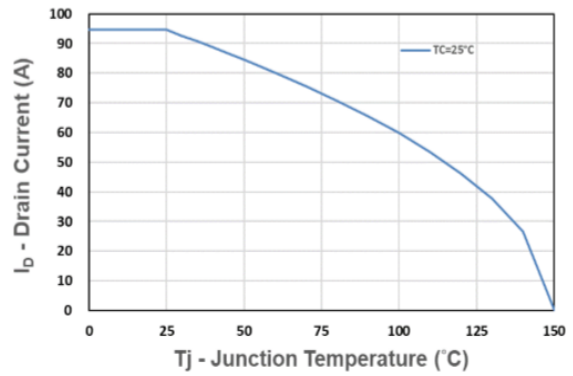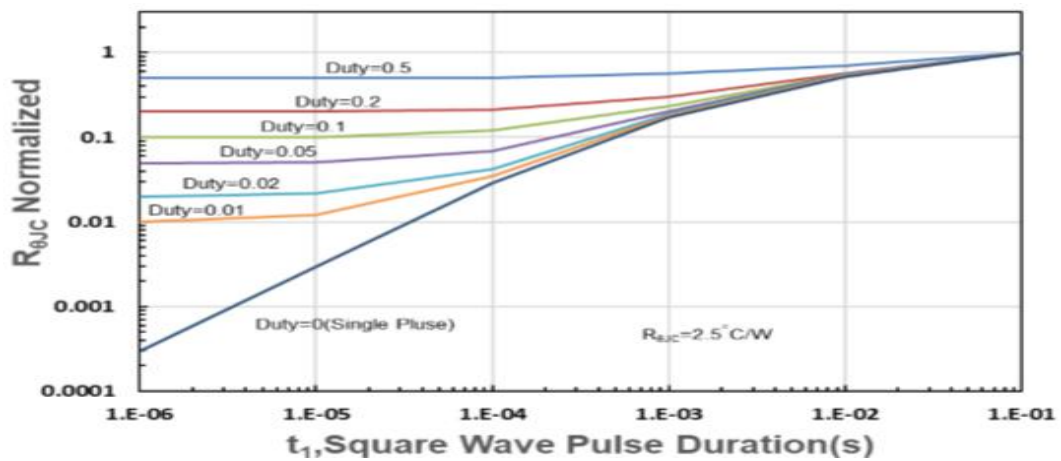
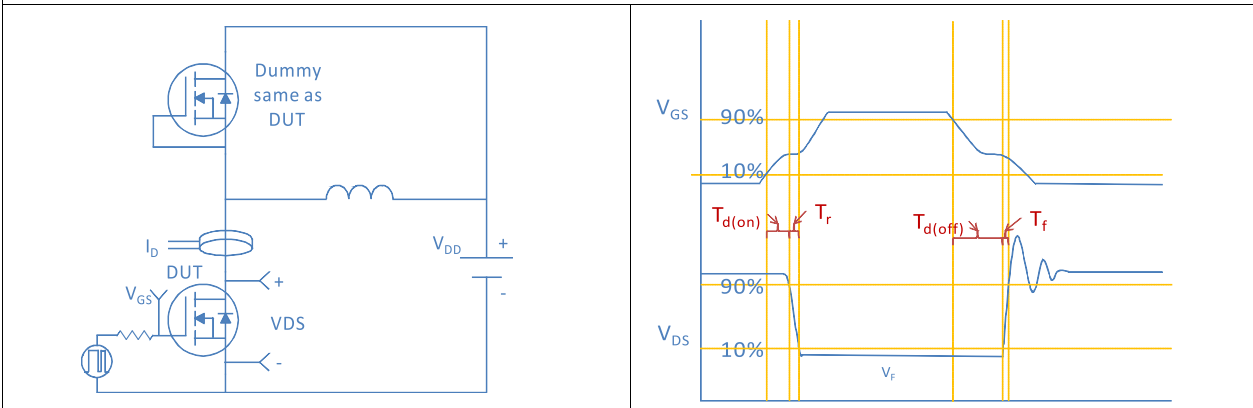

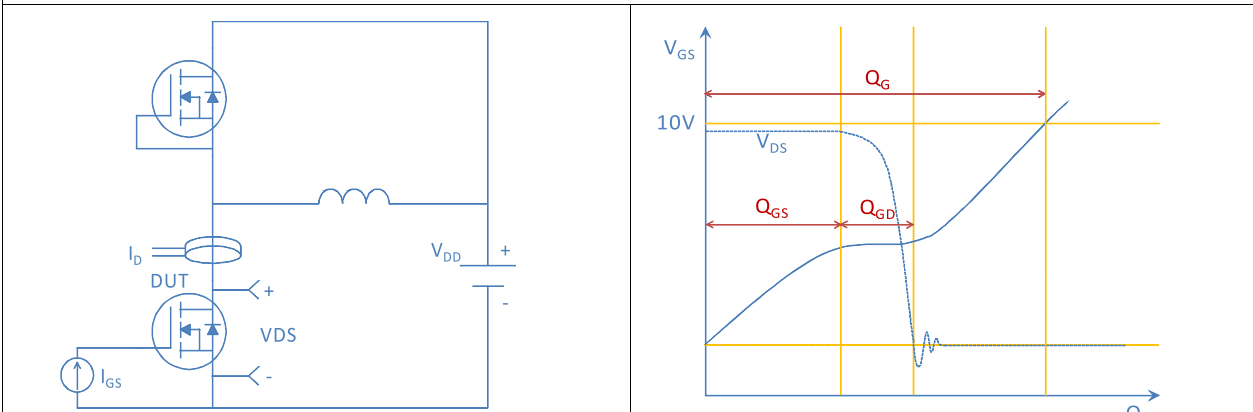Figure 10. Maximun Drain Current vs. Case Temperature

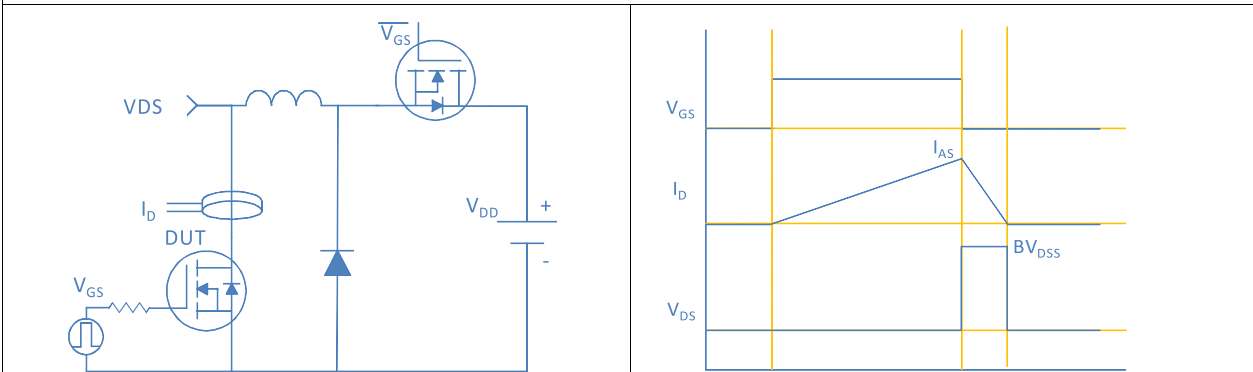Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case
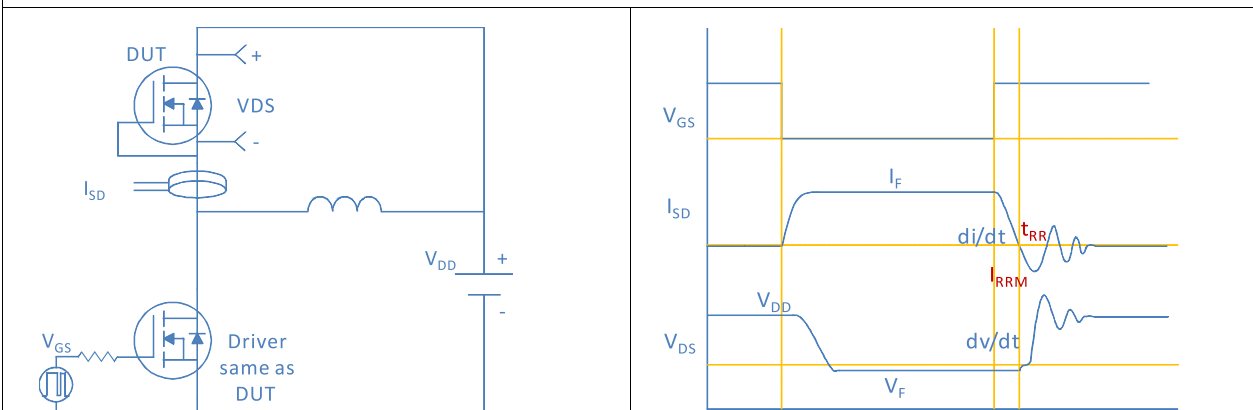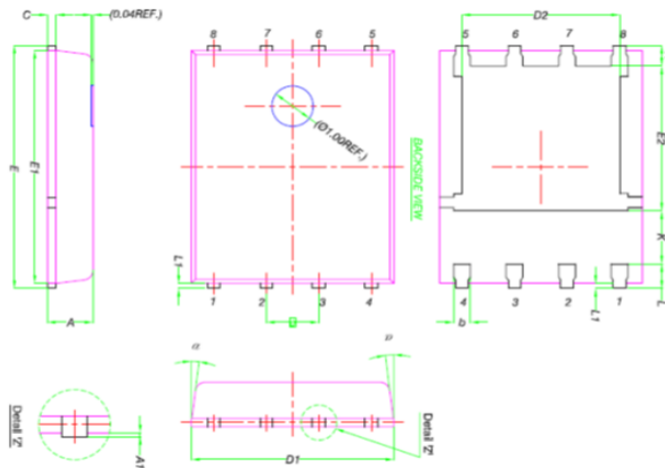
Inductive switching Test

Gate Charge Test

Uclamped Inductive Switching (UIS) Test

Diode Recovery Test

Package Outline

DFN5x6_P, 8 Leads

COMMON DIMENSIONS		
UNITS:MILLIMETERS		
SYMBOL	MIN	MAX
A	0.90	1.10
A1	0.00	0.05
b	0.33	0.51
C	0.20	0.30
D1	4.80	5.00
D2	3.61	3.96
E	5.90	6.10
E1	5.70	5.80
E2	3.38	3.78
e	1.27 BSC	
H	0.41	0.61
K	1.10	—
L	0.51	0.71
L1	0.06	0.20
α	0°	12°