30V P-Ch Power MOSFET

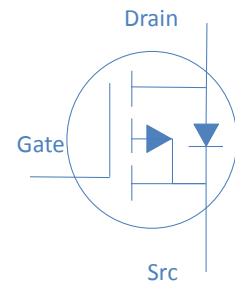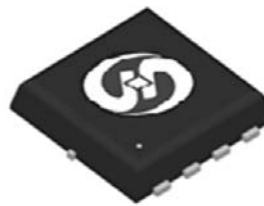| V_{DS}		-30	V
$R_{DS(on),typ}$	V_{GS}=-10V	17.5	mΩ
$R_{DS(on),typ}$	V_{GS}=-4.5V	26	mΩ
$I_{D\ (Sillicon\ Limited)}$		-18	A

Feature

◇ High Speed Power Switching, Logic Level
◇ Enhanced Avalanche Ruggedness
◇ 100% UIS Tested, 100% Rg Tested
◇ Lead Free, Halogen Free

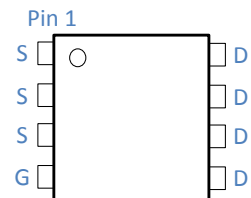## Application

◇ Hard Switching and High Speed Circuit
◇ DC/DC in Telecoms and Inductrial

DFN3x3

Part Number	Package	Marking
HTM200P03	DFN3*3	TM200P03

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_A=25℃	-18	A
		T_A=70℃	-13	
Drain to Source Voltage	V_{DS}	-	-30	V
Gate to Source Voltage	V_{GS}	-	±25	V
Pulsed Drain Current	I_{DM}	-	-72	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.1mH, T_C=25℃	5	mJ
Power Dissipation	P_D	T_A=25℃	2.5	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	6	℃/W

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

Static Characteristics

Parameter	Symbol	Conditions	Value min	Value typ	Value max	Unit
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250μA	-1.0	-1.50	-3.0	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=-24V, T_j=25℃	-	-	-1	μA
		V_{GS}=0V, V_{DS}=-20V, T_j=125℃	-	-	-10	
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-10A	-	17.5	20	mΩ
		V_{GS}=-4.5V, I_D=-7A	-	26	35	
Transconductance	g_{fs}	V_{DS}=-5V, I_D=-10A	-	24	-	S
Gate Resistance	R_G	V_{GS}=15mV, V_{DS} =0V, f=1MHz	-	4.5	-	Ω

Dynamic Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz	-	1407	-	pF
Output Capacitance	C_{oss}		-	208	-	
Reverse Transfer Capacitance	C_{rss}		-	164	-	
Total Gate Charge	Q_g (10V)	V_{DD}=-15V, I_D=-10A, V_{GS}=-10V	-	20.3	-	nC
	Q_g (4.5V)		-	10	-	
Gate to Source Charge	Q_{gs}		-	3.2	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	4.9	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=-15V, I_D=-1A, V_{GS}=-10V, R_G=2.7Ω,	-	10	-	ns
Rise time	t_r		-	8	-	
Turn off Delay Time	$t_{d(off)}$		-	25	-	
Fall Time	t_f		-	6	-	

Reverse Diode Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=-3.5A	-		-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-3.5A, dI_F/dt=100A/μs	-	32	-	ns
Reverse Recovery Charge	Q_{rr}		-	26	-	nC

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

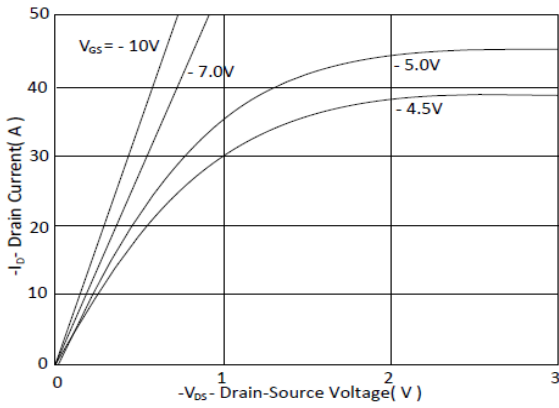Fig 1. Typical Output Characteristics

Figure 2. On-Resistance vs. Gate-Source Voltage

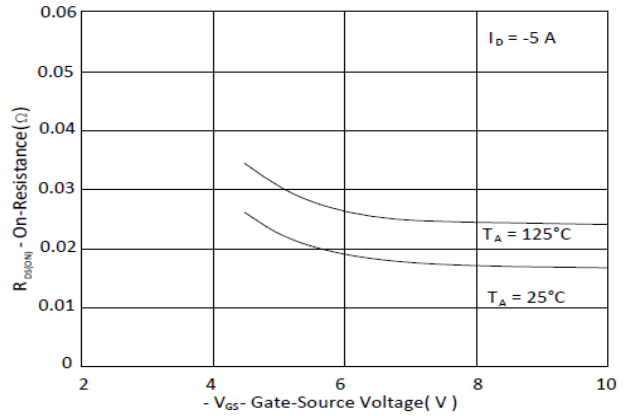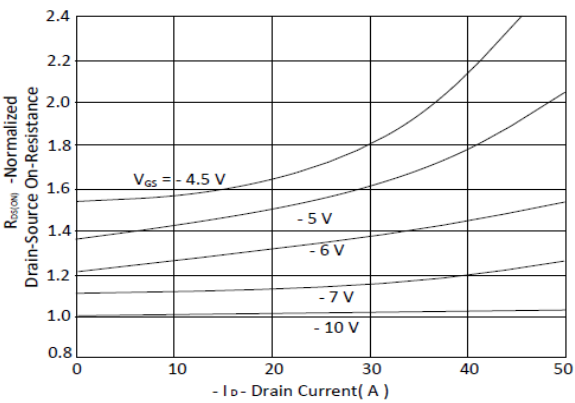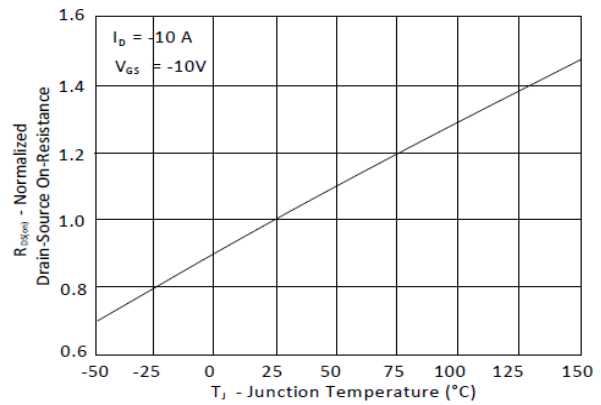| Figure 3. On-Resistance vs. Drain Current and Gate Voltage	Figure 4. Normalized On-Resistance vs. Junction Temperature

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

Figure 4. Normalized On-Resistance vs. Junction Temperature

Figure 5. Typical Transfer Characteristics	Figure 6. Typical Source-Drain Diode Forward Voltage

Figure 5. Typical Transfer Characteristics
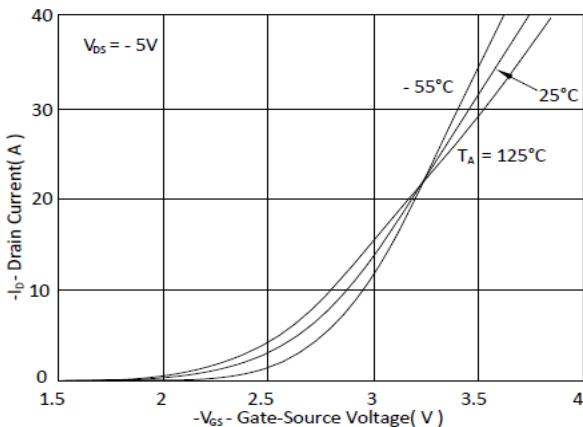
Figure 6. Typical Source-Drain Diode Forward Voltage
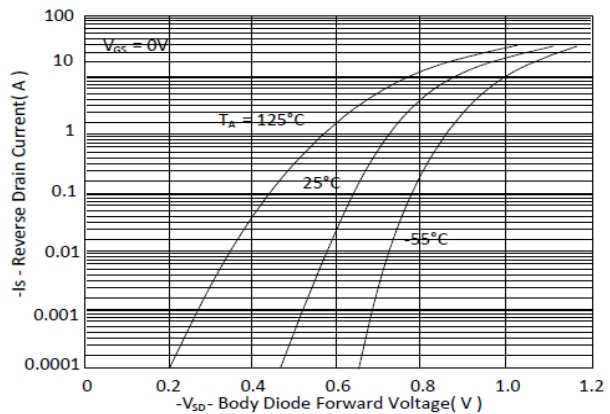
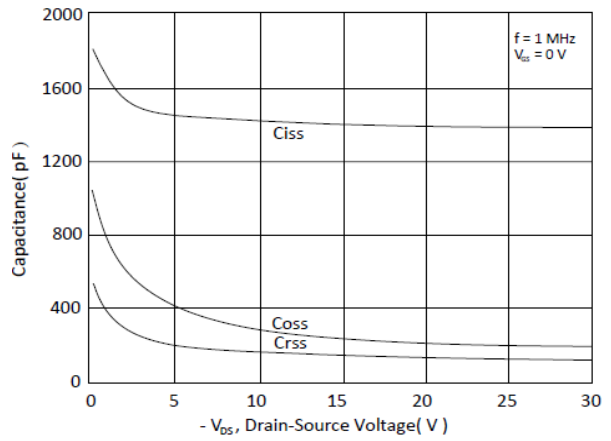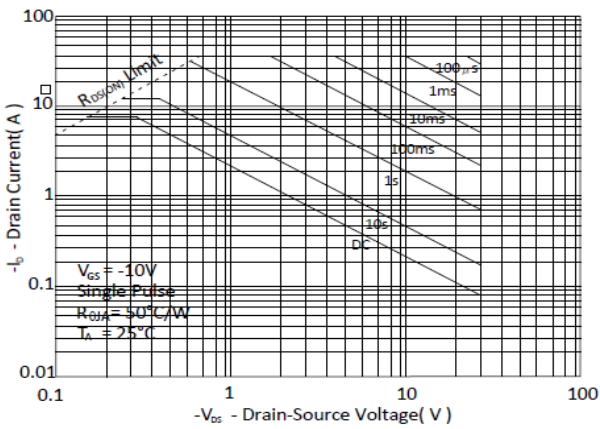| Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage	Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
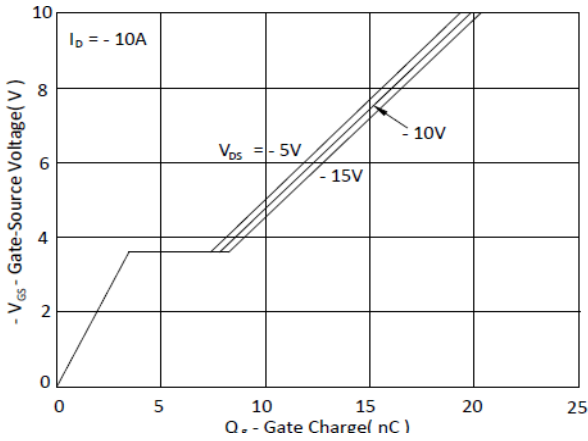
Figure 9. Maximum Safe Operating Area
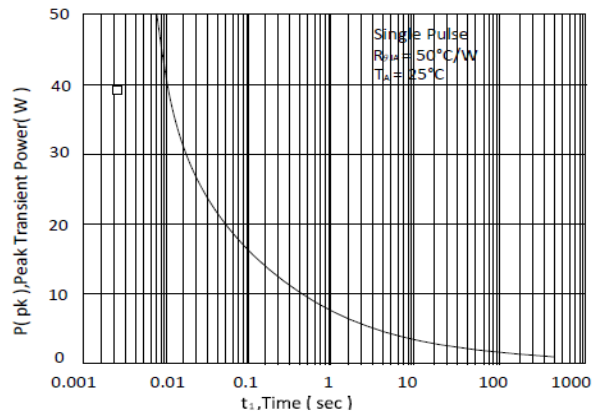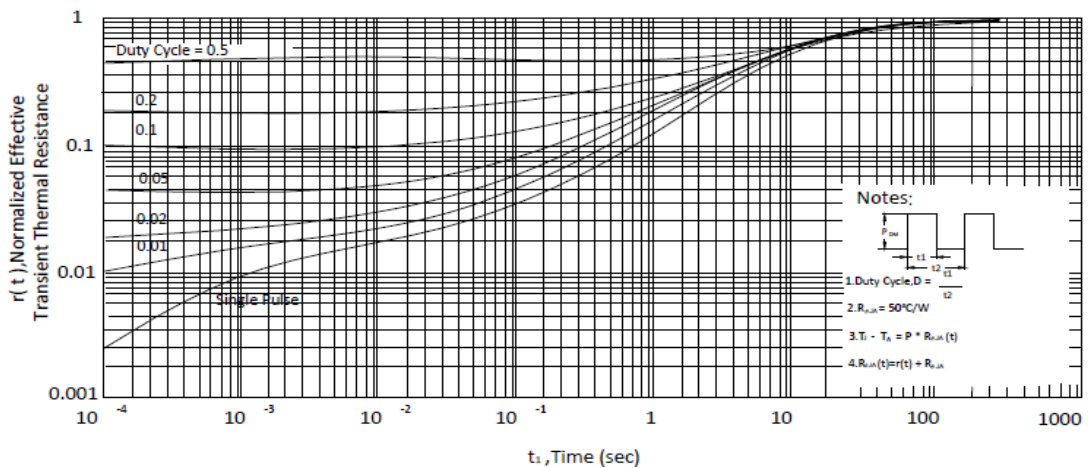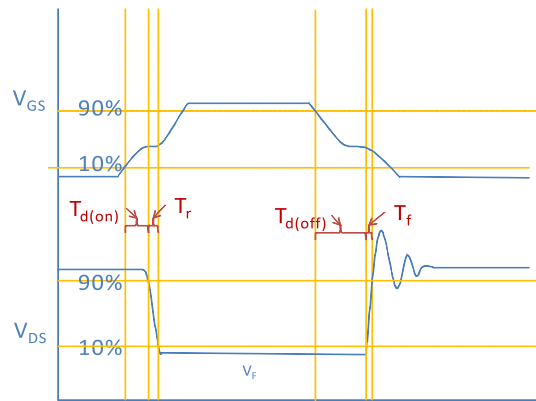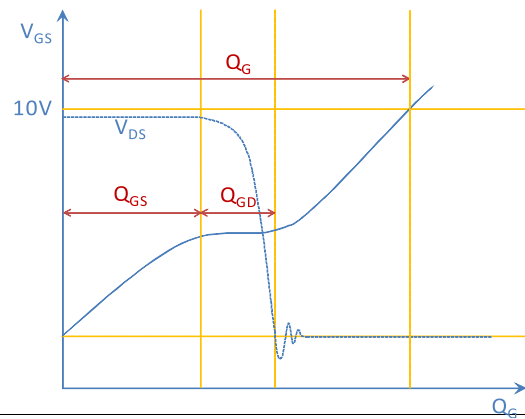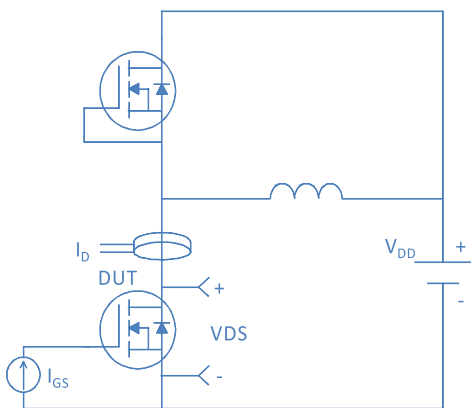
Figure 10. Single Pulse Maximum Power Dissipation

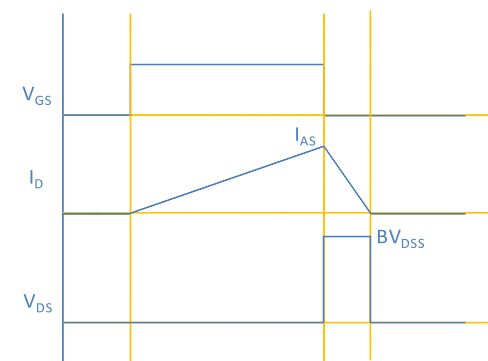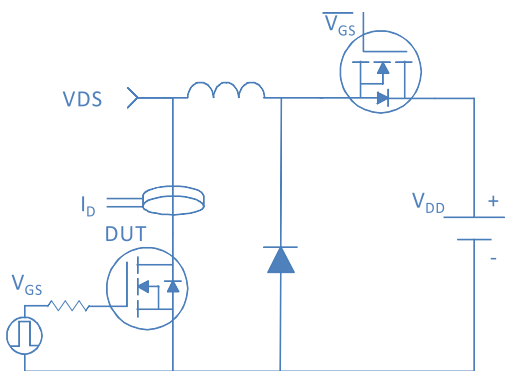Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

Ver 1.0   Aug. 2017

Inductive switching Test

V_{GS} 90% 10%

$T_{d(on)}$ T_r $T_{d(off)}$ T_f

V_{DS} 90% 10%

V_F

Dummy same as DUT

I_D DUT V_{GS} VDS V_{DD} + -

Gate Charge Test

V_{GS} 10V V_{DS} Q_G Q_{GS} Q_{GD} Q_G

I_D DUT VDS V_{DD} + - I_{GS}

Uclamped Inductive Switching (UIS) Test

$\overline{V_{GS}}$ VDS I_D DUT V_{GS} V_{DD} + -

V_{GS} I_D I_{AS} BV_{DSS} V_{DS}

Diode Recovery Test

DUT VDS I_{SD} V_{GS} Driver same as DUT V_{DD} + -

V_{GS} I_{SD} I_F di/dt t_{RR} I_{RRM} V_{DD} V_{DS} dv/dt V_F

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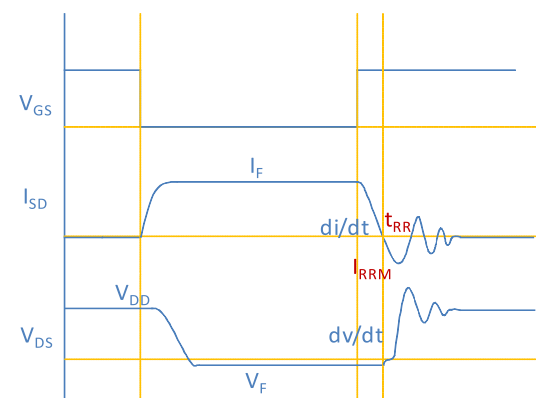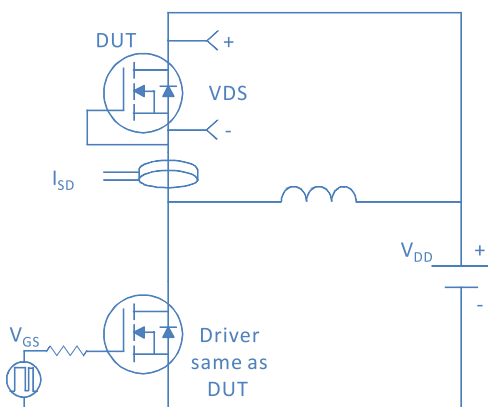
Package Outline

DFN3*3, 8leads
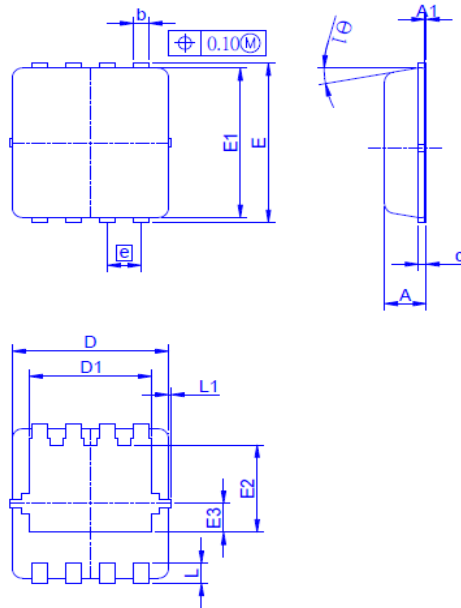
Dimension in mm

Dimension	A	A1	b	c	D	D1	E	E1	E2	E3	e	L	L1	Θ1
Min.	0.70	0	0.24	0.10	2.95	2.25	3.15	2.95	1.65			0.30		0°
Typ.	0.80		0.30	0.152	3.00	2.35	3.20	3.00	1.75	0.575	0.65	0.40	0.13	10°
Max.	0.90	0.05	0.37	0.25	3.15	2.45	3.40	3.15	1.96			0.50		12°