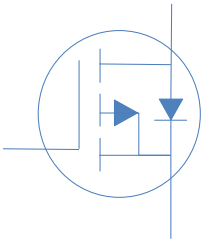
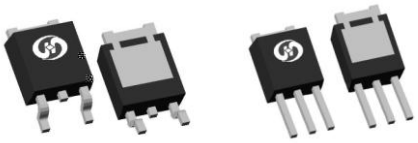
135V P-Ch Power MOSFET

V_{DS}		-135	V
$R_{DS(on),typ}$	V_{GS}=-10V	200	mW
I_D		-12	A





Part Number	Package	Marking
HTD2K4P15T	TO-252	TD2K4P15T
HTI2K4P15T	TO-251	TI2K4P15T

Absolute Maximum Ratings at T_j

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	I_D	T_C	-12.0	A
Drain to Source Voltage	V_{DS}	-	-135	V
Gate to Source Voltage	V_{GS}	-	20	V
Pulsed Drain Current	I_{DM}	-	-48	A
Avalanche Energy, Single Pulse	E_{AS}	L=5mH, T_C	250	mJ
Power Dissipation	P_D	T_C	60	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	R	2.1	
Thermal Resistance Junction-Ambient	R	50	

Electrical Characteristics at T_j

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250mA	-135	-150	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250mA	-2	-	-4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=-135V, T_j	-	-	-1	mA
Gate to Source Leakage Current	I_{GSS}	V_{GS} $_{DS}$=0V	-	-	100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-7.5A	-	200	240	mW
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	5.3	-	W

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz	-	1245	-	pF
Output Capacitance	C_{oss}		-	175	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Total Gate Charge	Q_g (10V)	V_{DD}=-120V, I_D=-7.5A, V_{GS}=-10V	-	31	-	nC
Gate to Source Charge	Q_{gs}		-	5	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	12	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=-75V, I_D=-7.5A, V_{GS}=-10V, R_G=10W,	-	18	-	ns
Rise time	t_r		-	8	-	
Turn off Delay Time	$t_{d(off)}$		-	63	-	
Fall Time	t_f		-	14	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=-12A	-	-	1.2	V

Fig 1. Typical Output Characteristics

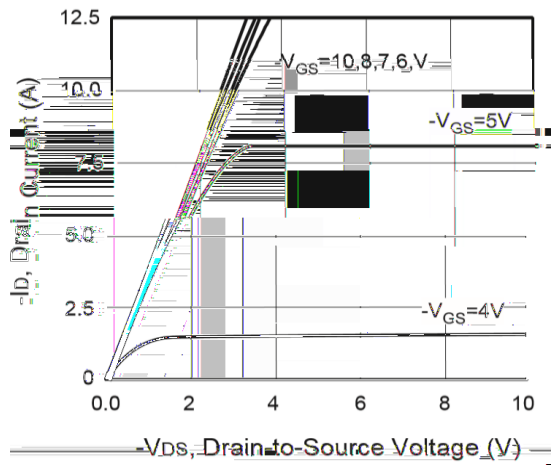


Figure 2. Normalized Thershold Voltage vs. Junction Temperature

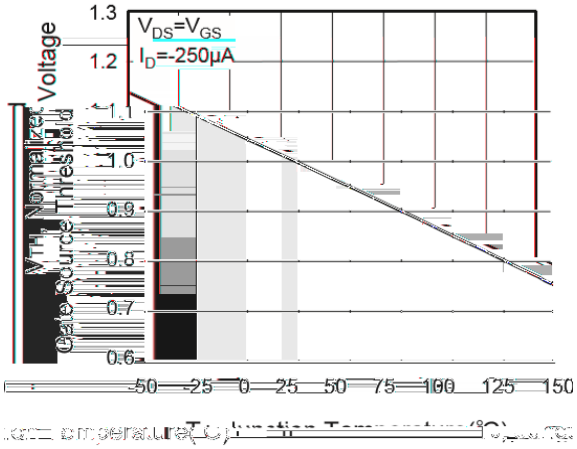


Figure 3. Maximum Safe Operating Area

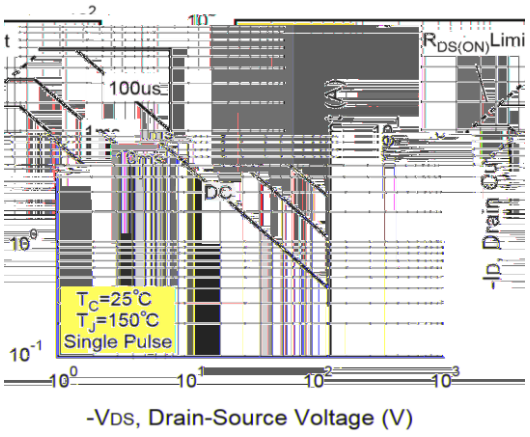


Figure 4. Normalized On-Resistance vs. Junction Temperature

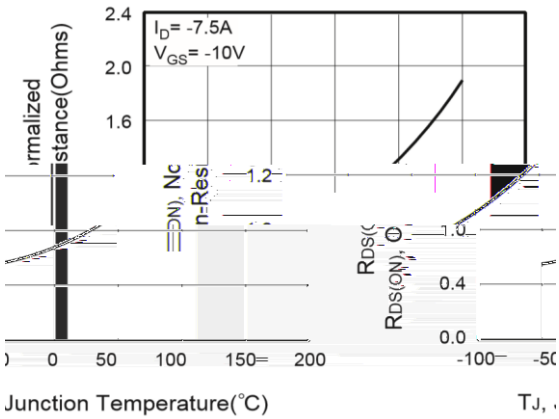


Figure 5. Typical Transfer Characteristics

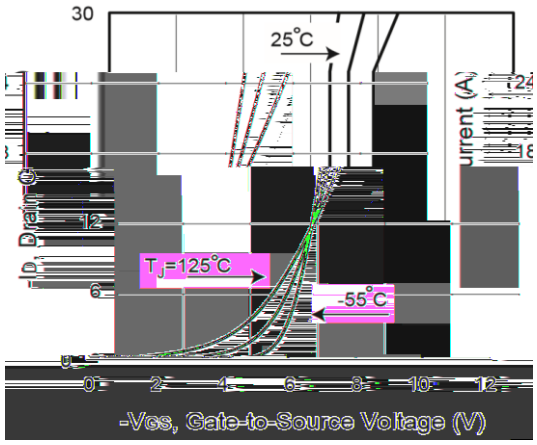


Figure 6. Typical Source-Drain Diode Forward Voltage

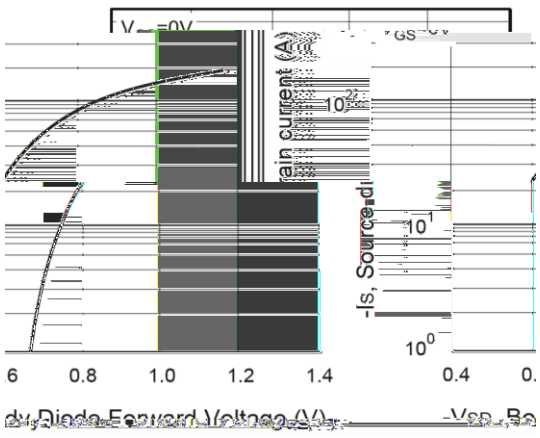


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

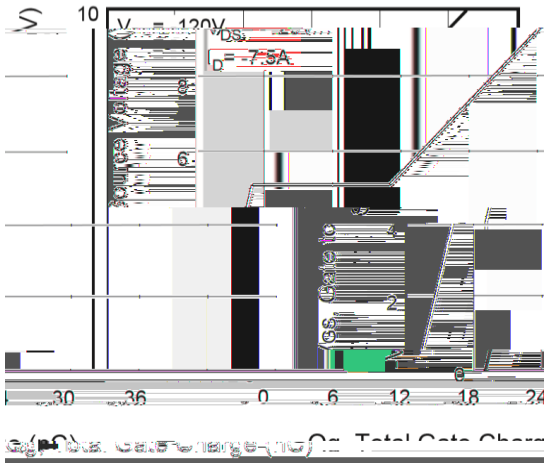


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

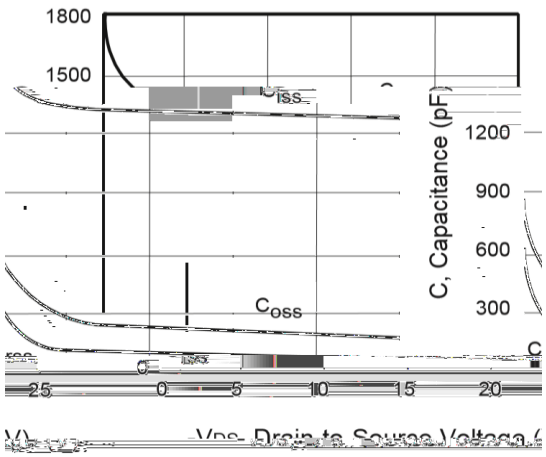
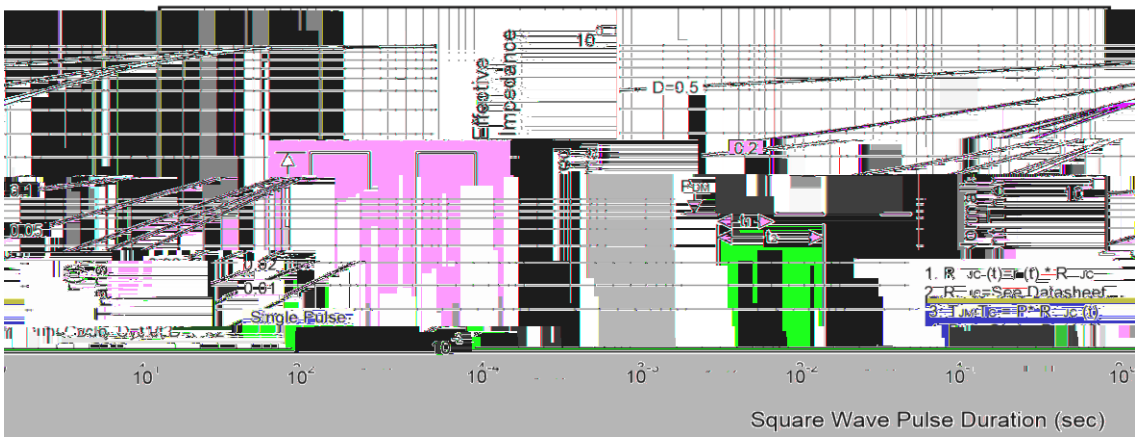
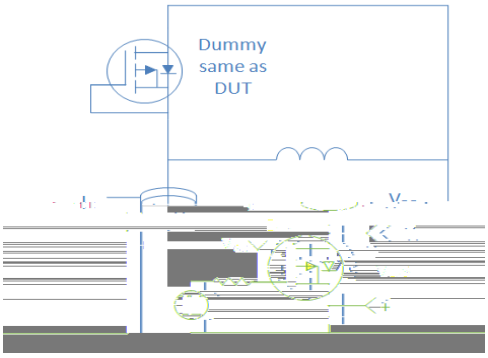
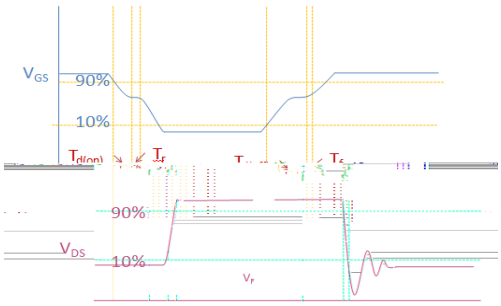


Figure 9. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

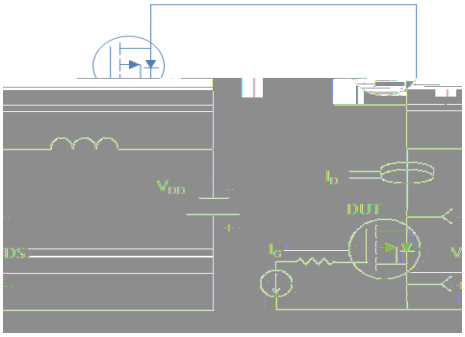


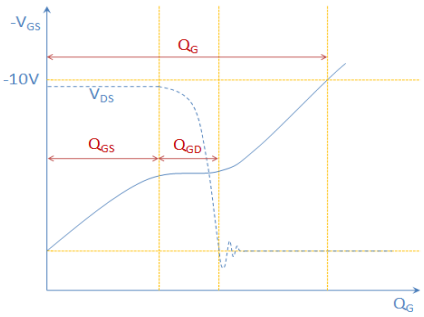
Inductive switching Test



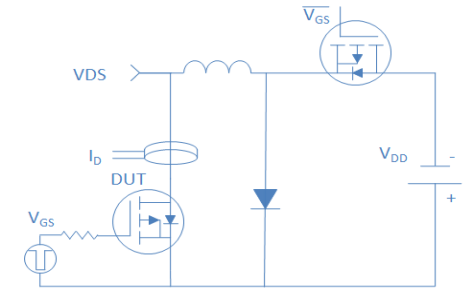


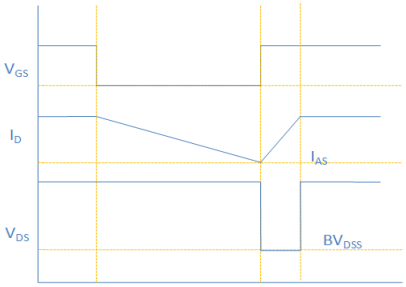
Gate Charge Test



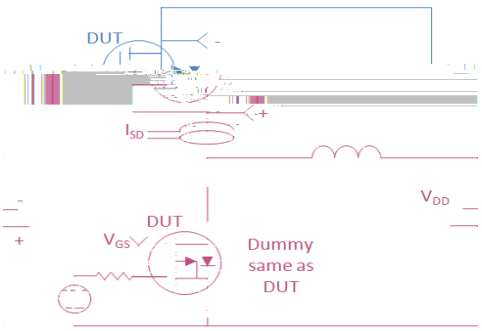


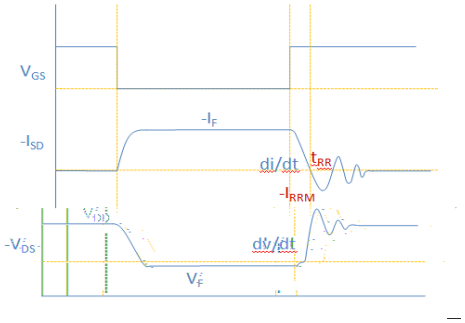
Uclamped Inductive Switching (UIS) Test



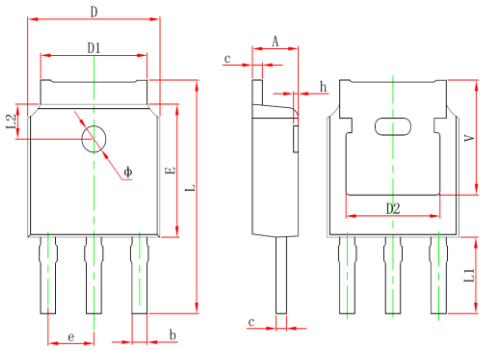


Diode Recovery Test



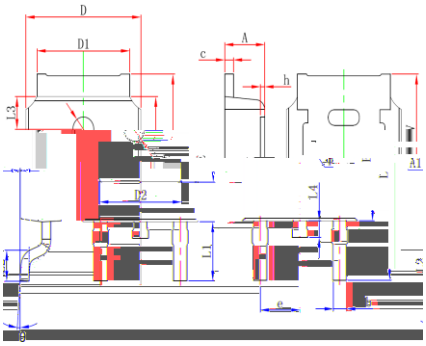


TO-251, 3 leads



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.660	0.860	0.026	0.034
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
V	5.350 REF.		0.211 REF.	

TO-252, 2 leads



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
V	5.350 REF.		0.211 REF.	