

## 30V Dual N-Channel Power MOSFET

### Feature

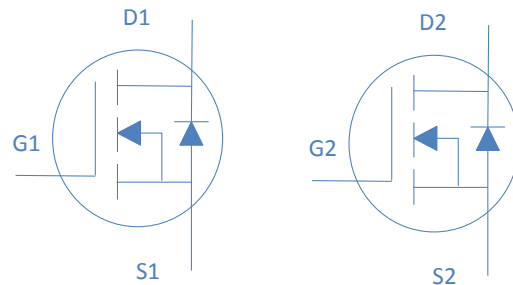
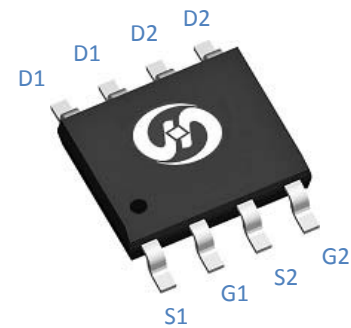
- ◇ High Speed Power Switching, logic level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free

### Application

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

$V_{DS}$		30	V
$R_{DS(on),typ}$	$V_{GS}=10V$	9.5	m $\Omega$
$R_{DS(on),typ}$	$V_{GS}=4.5V$	14.5	m $\Omega$
$I_D$		12	A

### SOIC-8



Part Number	Package	Marking
HTS110A03	SOIC-8	TS110A03

### Absolute Maximum Ratings at $T_J=25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	$I_D$	$T_A=25^\circ\text{C}$	12	A
		$T_A=100^\circ\text{C}$	8.5	
Drain to Source Voltage	$V_{DS}$	-	30	V
Gate to Source Voltage	$V_{GS}$	-	$\pm 20$	V
Pulsed Drain Current	$I_{DM}$	-	48	A
Avalanche Energy, Single Pulse	$E_{AS}$	$L=0.1\text{mH}, T_C=25^\circ\text{C}$	7.2	mJ
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	2	W
Operating and Storage Temperature	$T_J, T_{stg}$	-	-55 to 150	$^\circ\text{C}$

### Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	25	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

**Electrical Characteristics at  $T_j=25^{\circ}\text{C}$  (unless otherwise specified)**
**Static Characteristics**

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.7	3	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=24V, T_j=25^{\circ}\text{C}$	-	-	1	$\mu A$
		$V_{GS}=0V, V_{DS}=20V, T_j=125^{\circ}\text{C}$	-	-	25	
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$	-	9.5	11	m $\Omega$
		$V_{GS}=4.5V, I_D=9A$	-	14.5	18.5	
Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=12A$	-	28	-	S
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	1.7	-	$\Omega$

**Dynamic Characteristics**

Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=15V, f=1\text{MHz}$	-	828	-	pF
Output Capacitance	$C_{oss}$		-	196	-	
Reverse Transfer Capacitance	$C_{rss}$		-	174	-	
Total Gate Charge	$Q_g (10V)$	$V_{DD}=15V, I_D=12A, V_{GS}=10V$	-	17.6	-	nC
Total Gate Charge	$Q_g (4.5V)$		-	11.9	-	
Gate to Source Charge	$Q_{gs}$		-	2.8	-	
Gate to Drain (Miller) Charge	$Q_{gd}$		-	7.4	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=15V, I_D=1A, V_{GS}=10V, R_G=6\Omega,$	-	12	-	ns
Rise time	$t_r$		-	10	-	
Turn off Delay Time	$t_{d(off)}$		-	30	-	
Fall Time	$t_f$		-	15	-	

**Reverse Diode Characteristics**

Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=2.3A$	-		1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=2.3A, di_F/dt=100A/\mu s$	-	22	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	12	-	nC

Fig 1. Typical Output Characteristics

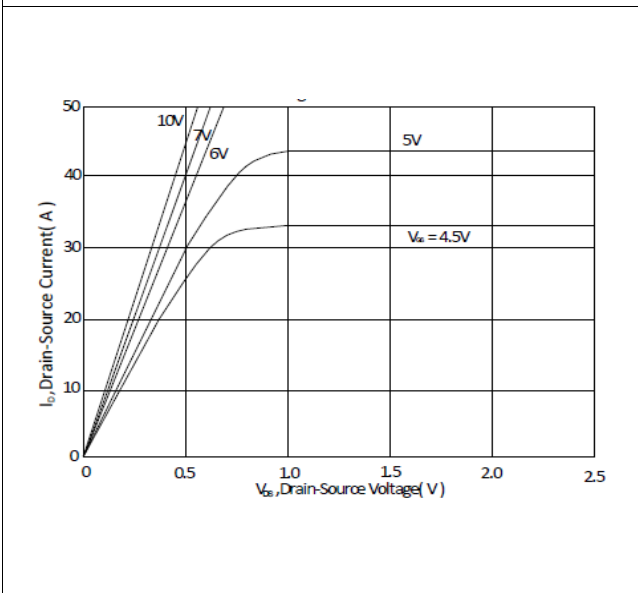


Figure 2. On-Resistance vs. Gate-Source Voltage

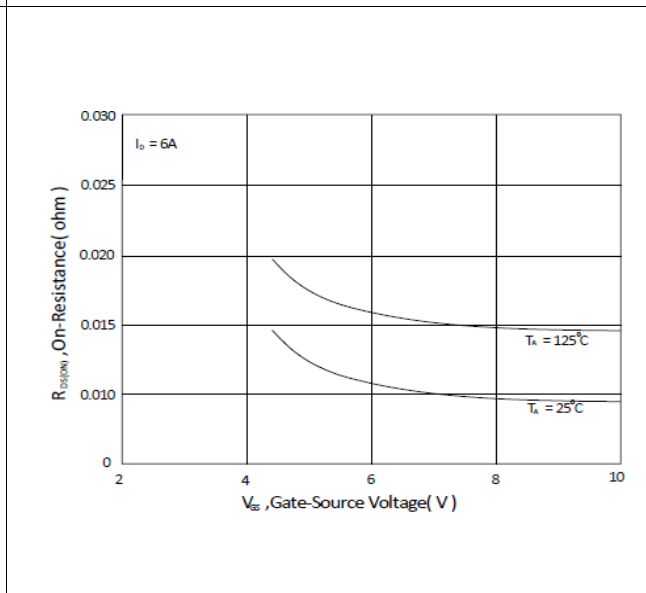


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

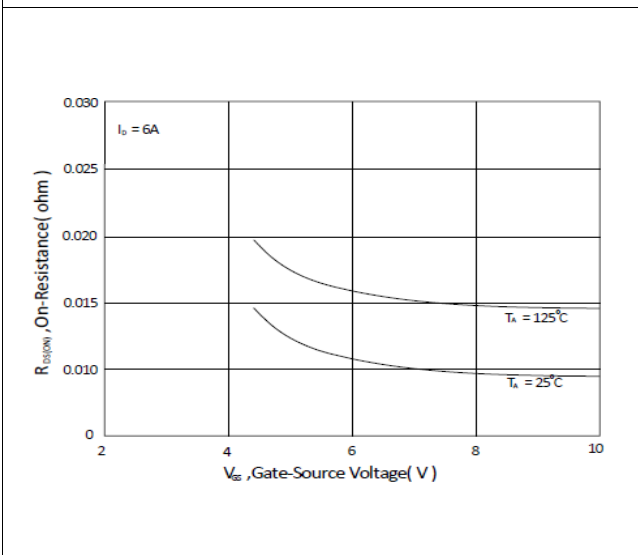


Figure 4. Normalized On-Resistance vs. Junction Temperature

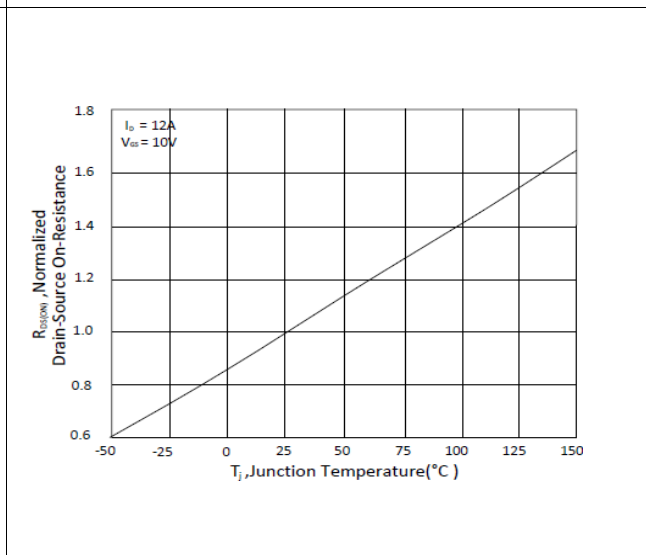


Figure 5. Typical Transfer Characteristics

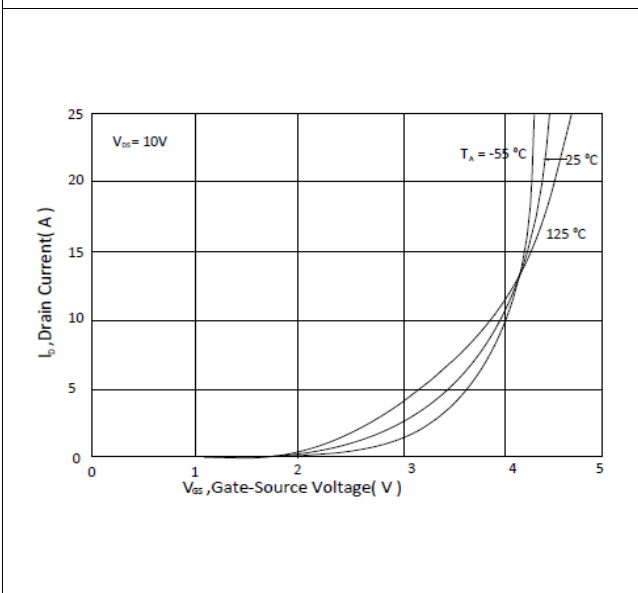


Figure 6. Typical Source-Drain Diode Forward Voltage

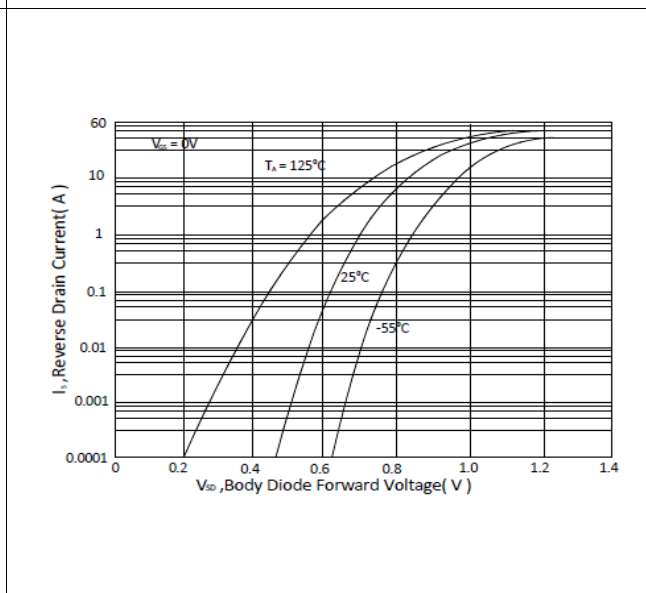


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

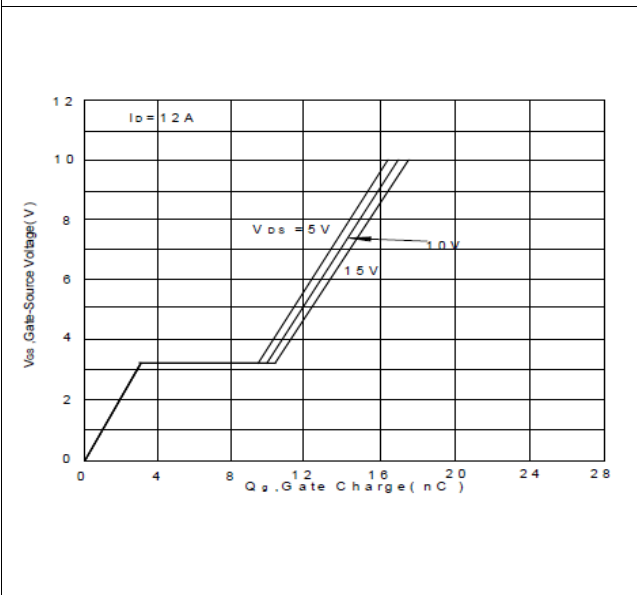


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

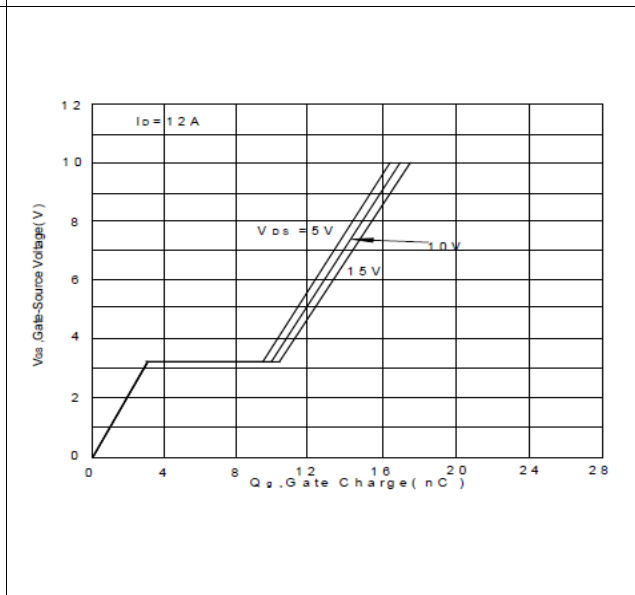


Figure 9. Maximum Safe Operating Area

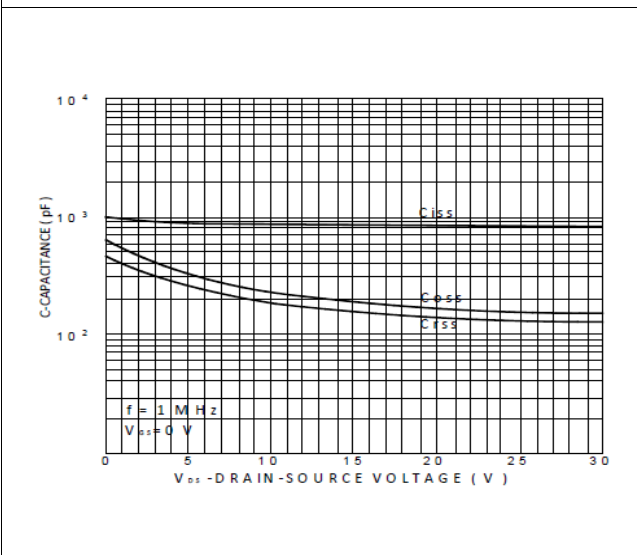


Figure 10. Single Pulse Maximum Power Dissipation

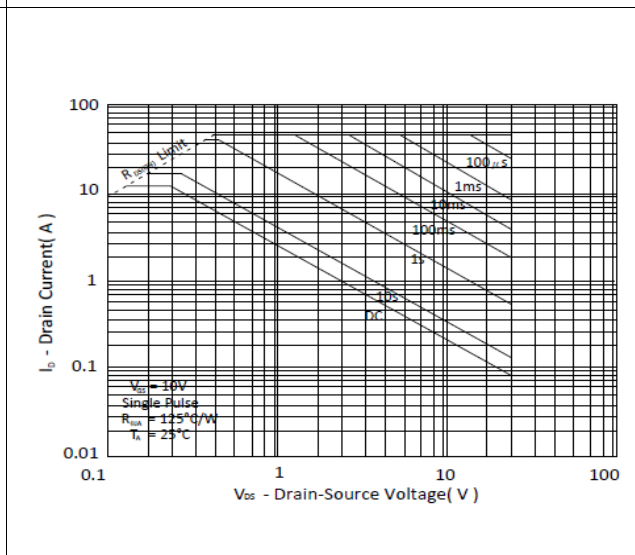
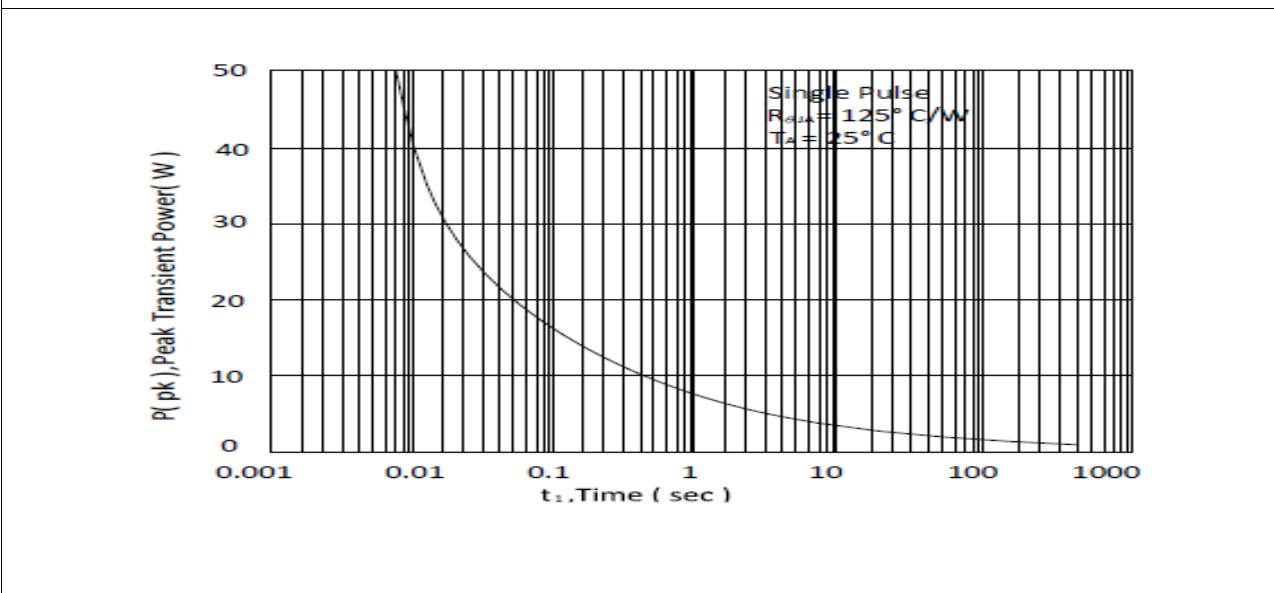
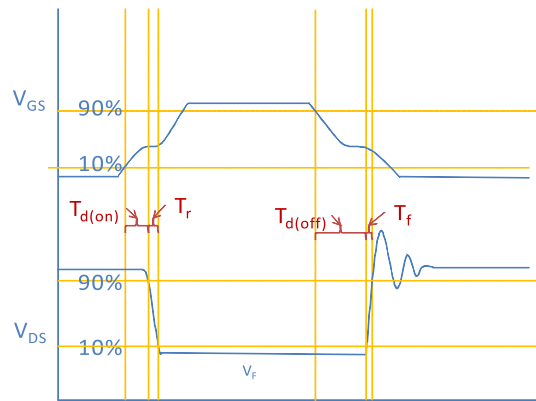


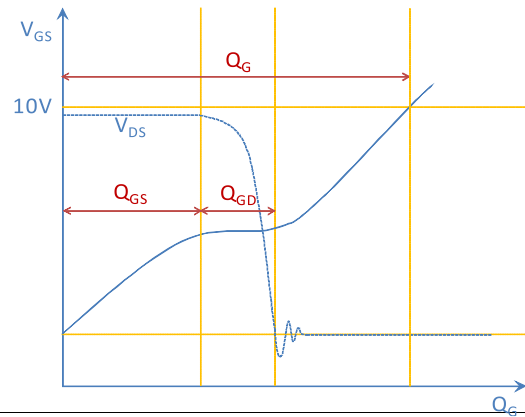
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



Inductive switching Test



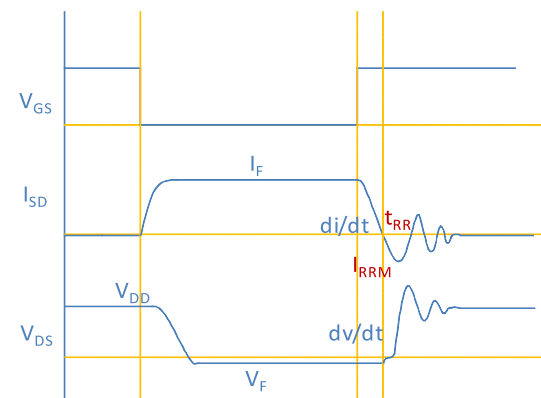
Gate Charge Test



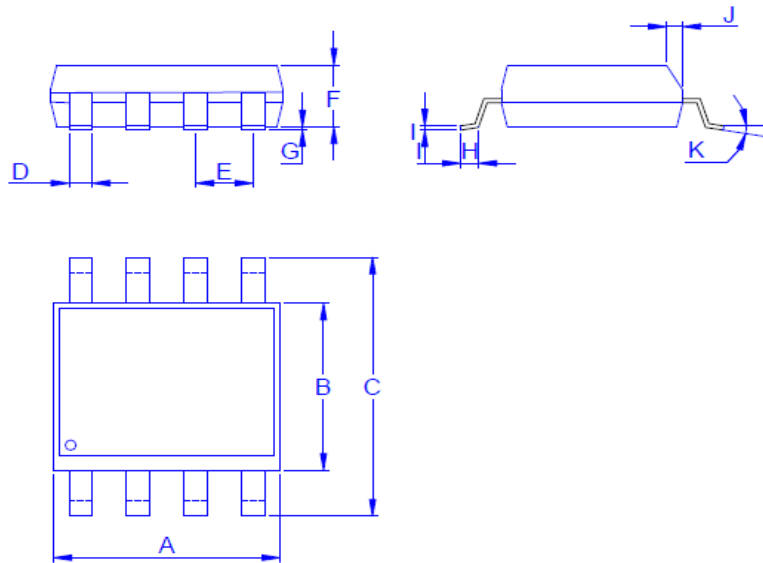
Uclamped Inductive Switching (UIS) Test



Diode Recovery Test



SOIC-8, 8 leads



Dimension in mm

Dimension	A	B	C	D	E	F	G	H	I	J	K
Min.	4.70	3.70	5.80	0.33		1.20	0.08	0.40	0.19	0.25	0°
Typ.					1.27						
Max.	5.10	4.10	6.20	0.51		1.62	0.28	0.83	0.26	0.50	8°