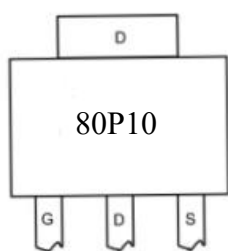


**Features**

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

 B_{vds} **-100V** **R_{dson}** **22m Ω** **I_D** **-80A****Application**

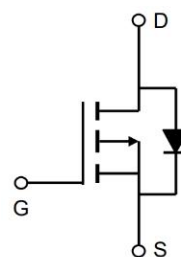
- DC-DC Converters
- Synchronous-rectification applications
- Power management functions

RoHS**Package**

Marking and pin assignment



TO220 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
80P10	S80P10T	TO220	50

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@10V^{1,6}$	$T_C=25^{\circ}\text{C}$	I_D	-80	A
	$T_C=100^{\circ}\text{C}$		-41	A
Pulsed Drain Current ²		I_{DM}	-260	A
Single Pulse Avalanche Energy ³		EAS	-	mJ
Total Power Dissipation ⁴	$T_C=25^{\circ}\text{C}$	P_D	250	W
Storage Temperature Range		T_{STG}	-55 ~ 150	$^{\circ}\text{C}$
Operating Junction Temperature Range		T_J	-55 ~ 150	$^{\circ}\text{C}$



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance, Junction -to-Ambient ¹	$R_{\theta JA}$	62	°C/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS80P10T	TO220	1	2	3	Tube

Electrical Characteristics (T_j=25°C unless otherwise noted)

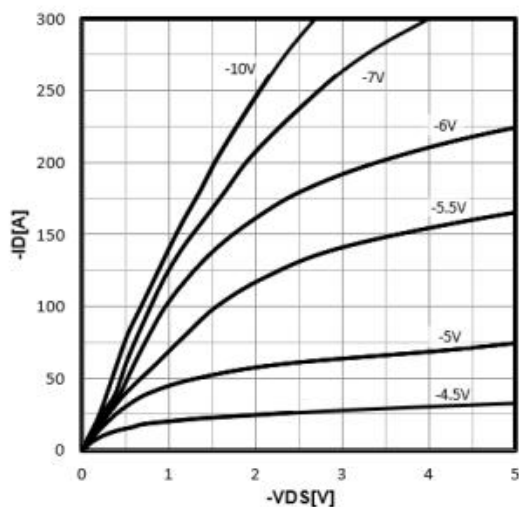
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	-3	-4	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-15A$	-	22	25	m Ω
Input Capacitance	C_{iss}	$V_{DS}=-50V, V_{GS}=0V,$ $f=1MHz$	-	4200	-	pF
Output Capacitance	C_{oss}		-	536	-	
Reverse Transfer Capacitance	C_{rss}		-	52	-	
Gate Resistance	R_g	-	-	-	-	Ω
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-30V, I_D=-3A$	-	76	-	nC
Gate-Source Charge	Q_{gs}		-	13	-	
Gate-Drain Charge	Q_{gd}		-	12.4	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{GS}=-10V, V_{DD}=-50V,$ $R_G=3\Omega, R_L=0.75\Omega, I_D=-15A$	-	13	-	ns
Rise Time	T_r		-	51	-	
Turn-Off Delay Time	$T_{d(off)}$		-	177	-	
Fall Time	T_f		-	82	-	
Continuous Source Current ^{1,4}	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	-80	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=-15A, T_J=25^\circ C$	-	-	-1.2	V
Reverse Recovery time	T_{rr}	$I_F=-15A, di/dt=100A/\mu s, T_J=25^\circ C$	-	110	-	ns
Reverse Recovery Charge	Q_{rr}		-	590	-	nC



Typical Performance Characteristics

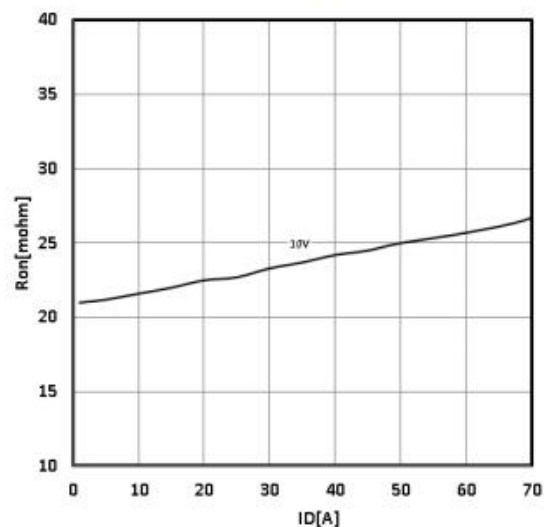
Typ. output characteristics

$$I_D = f(V_{DS})$$



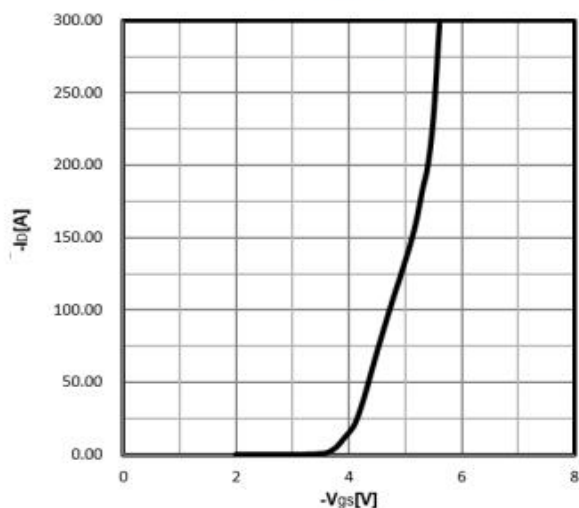
Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$



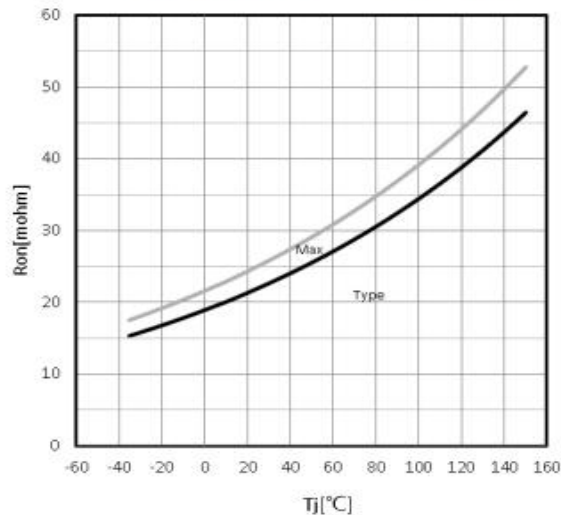
Typ. transfer characteristics

$$I_D = f(V_{GS})$$



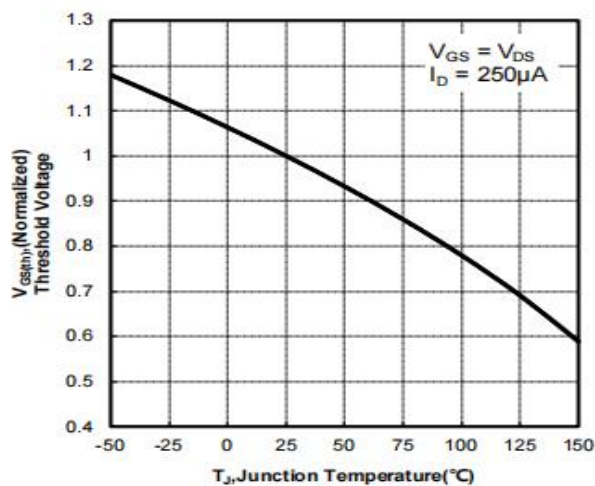
Drain-source on-state resistance

$$R_{DS(on)} = f(T_J); I_D = -15A; V_{GS} = -10V$$



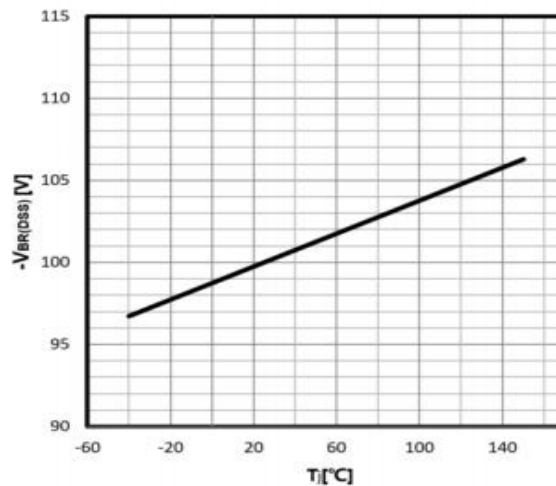
Gate Threshold Voltage

$$-V_{TH} = f(T_J); I_D = -250\mu A$$



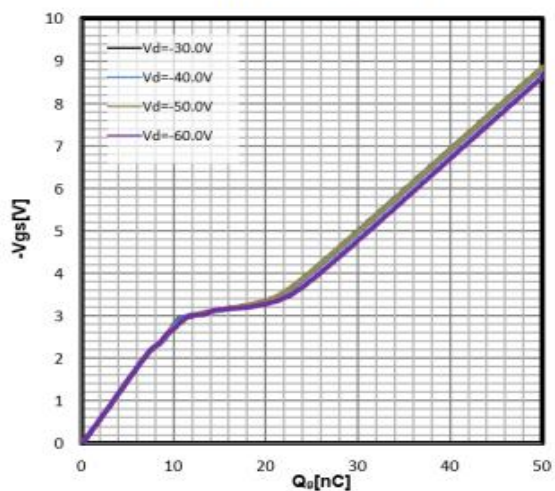
Drain-source breakdown voltage

$$V_{BR(DSS)} = f(T_J); I_D = -250\mu A$$

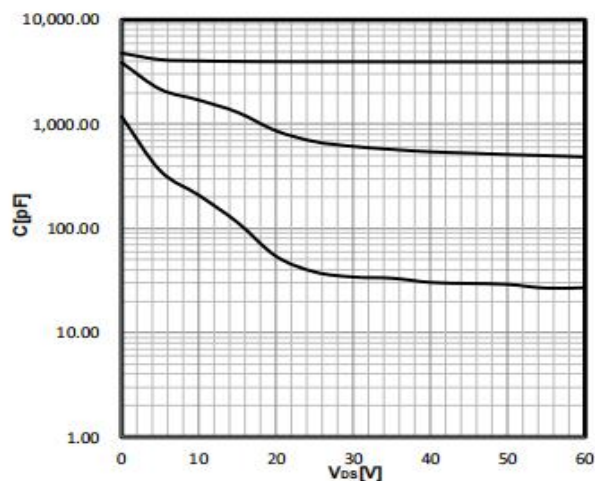




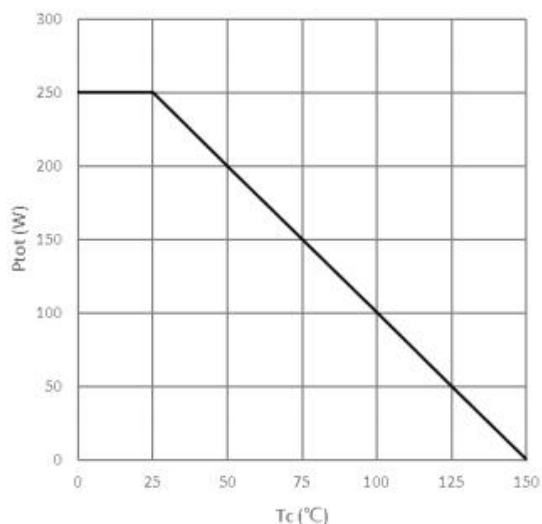
Typ. gate charge
 $V_{GS}=f(Q_{gate}); I_D=-15A$



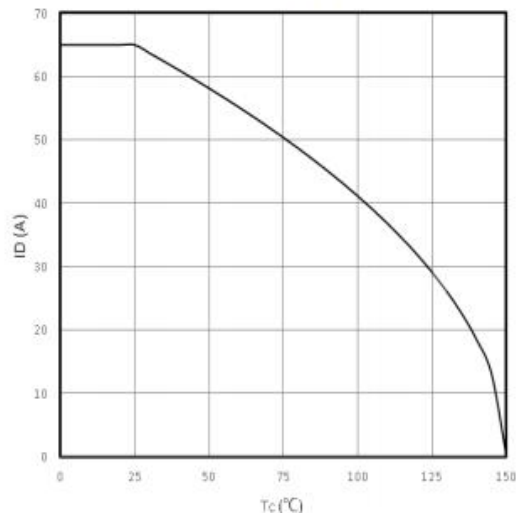
Typ. capacitances



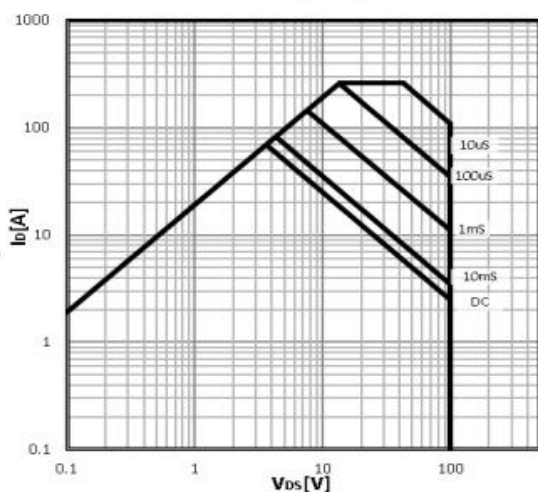
Power Dissipation
 $P_{tot}=f(T_C)$



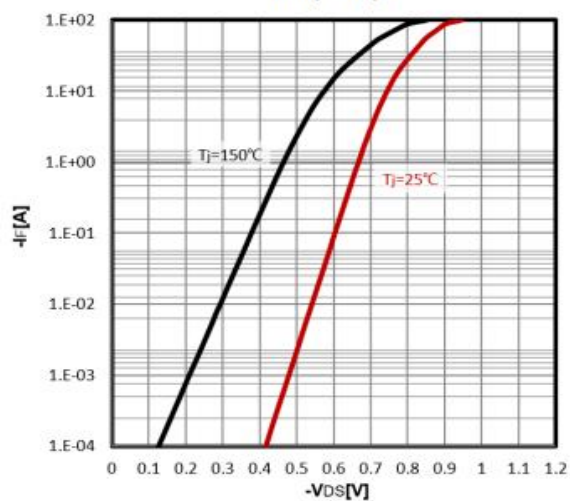
Maximum Drain Current
 $-I_D=f(T_C)$



Safe operating area
 $-I_D=f(-V_{DS})$

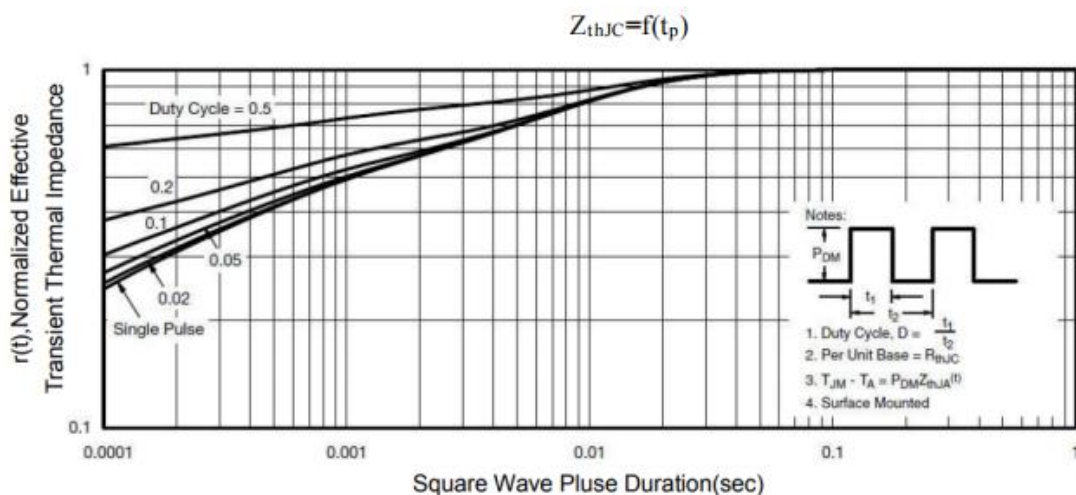


Body Diode Forward Voltage Variation
 $-I_F=f(-V_{DS})$



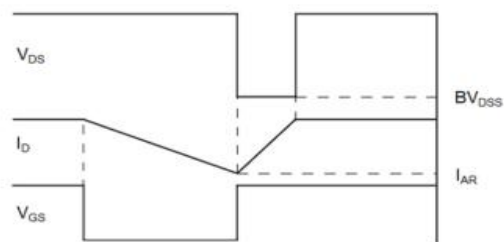
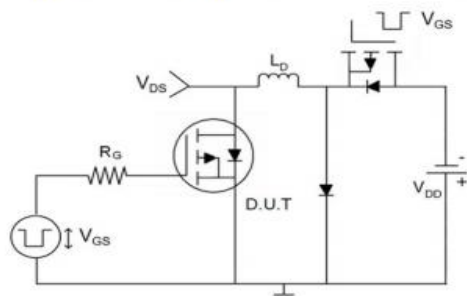


Max. transient thermal impedance

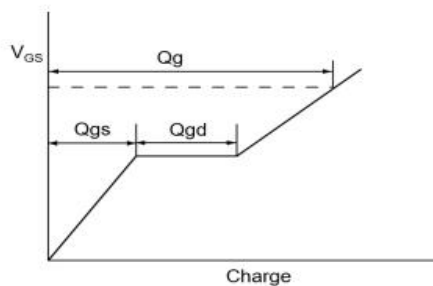
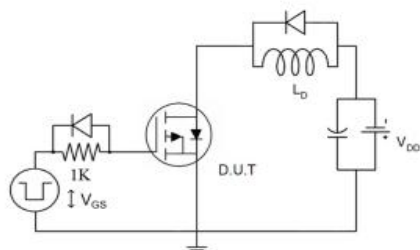


Test Circuit and Waveform

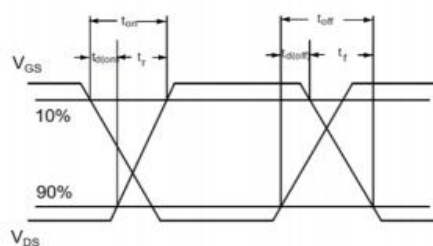
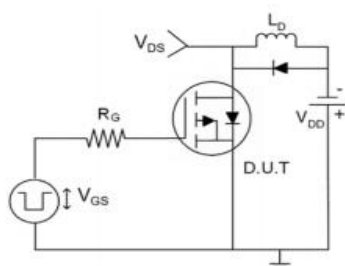
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit



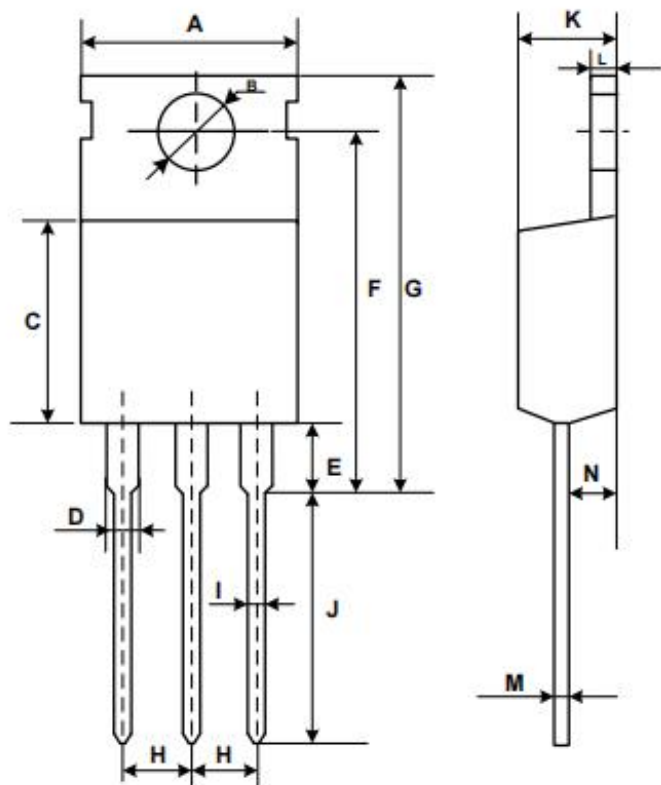
3) Switch Time Test Circuit





Package Dimensions TO220

COMMON DIMENSIONS



SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60



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