

### Description

The CMP60130U/D is the P-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

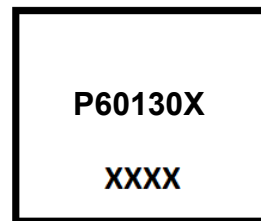
### Features

- $V_{DS}$ : -60V
- $I_D$ : -11A
- $R_{DS(on)}$  (@ $V_{GS}=-10V$ ): < 196m $\Omega$
- $R_{DS(on)}$  (@ $V_{GS}=-4.5V$ ): < 240m $\Omega$
- High density cell design for extremely low  $R_{DS(on)}$
- Excellent on-resistance and DC current capability

### Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Portable Instrumentation
- Load switch

### Marking Information

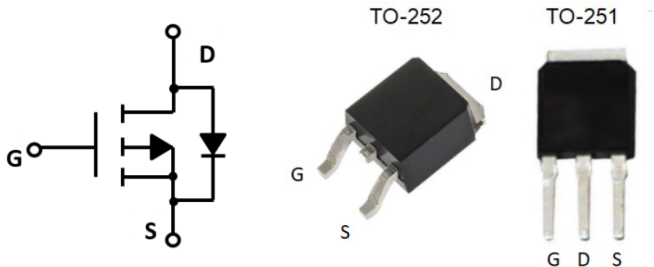


Marking Code = P60130X

Package type = X

Date Code = XXXX

### Equivalent Circuit and Pin Configuration



### Ordering Information

P/N	Package Type	Packaging	Remark
CMP60130U	TO-252	Tape and reel	ROHS
CMP60130D	TO-251	Tube	ROHS

### Absolute Maximum Ratings (Tc=25 °C unless otherwise noted)

Parameter	Symbol	Maximum	Unit	
Drain-source Voltage	$V_{DS}$	-60	V	
Gate-source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>(1)</sup>	$I_D$	Tc=25°C	-11	A
		Tc=100°C	-6	A
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	-42	A	
Total Power Dissipation <sup>(3)</sup>	$P_D @ T_c=25^\circ C$	42	W	
	Derating Factor above 25°C	0.33	W/°C	
Thermal Resistance Junction-to-Case <sup>(3)</sup>	$R_{\theta JC}$	3	°C/W	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C	

**Electrical Characteristics (TC=25 °C unless otherwise noted)**

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BVDSS	VGS=0V, ID=-250μA	-60			V
Zero Gate Voltage Drain Current	IDSS	VDS=-60V, VGS=0V, TC=25°C			-5	μA
Gate-Body Leakage Current	IGSS	VGS=±20V, VDS=0V			±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS, ID=-250μA	-1		-3	V
Static Drain-Source on-Resistance	RDS(on)	VGS=-10V, ID=-4.5A		163	196	mΩ
		VGS=-4.5V, ID=-4A		190	240	
Diode Forward Voltage	VSD	IS=-11A, VGS=0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	IS				-11	A
<b>Dynamic Parameters</b>						
Input Capacitance	Ciss	VDS=-25V, VGS=0V, f=1MHz		480		pF
Output Capacitance	Coss			28		
Reverse Transfer Capacitance	Crss			22		
<b>Switching Parameters</b>						
Total Gate Charge	Qg	VGS=-10V, VDS=-48V, ID=-8A		3.5		nC
Gate Source Charge	Qgs			0.3		
Gate Drain Charge	Qgd			0.8		
Turn-on Delay Time	tD(on)	VGS=-10V, VDD=-48V, ID=-8A, RGEN=2.2Ω		7		ns
Turn-on Rise Time	tr			5.1		
Turn-off Delay Time	tD(off)			62		
Turn-off Fall Time	tf			18.8		

Noted: (1) Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

(2) The test with different tester may be preformed differently.

(3) Device mounted on FR-4 PCB , 1 inch x 0.85 inch x 0.062 inch with 2oz. Copper , t ≤ 10s.

**Typical Performance Characteristics**

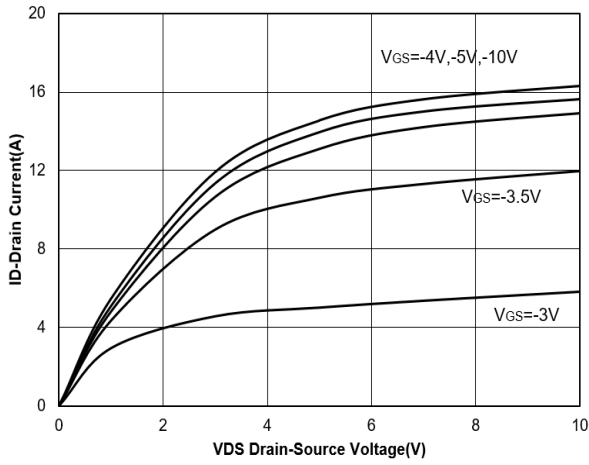


Figure 1. Output Characteristics

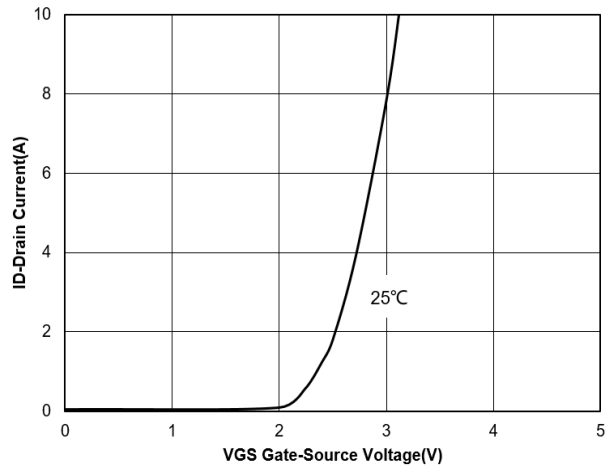


Figure 2. Transfer Characteristics

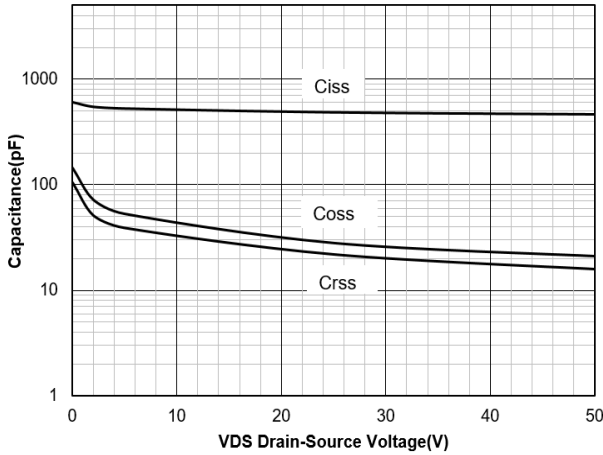


Figure 3. Capacitance Characteristics

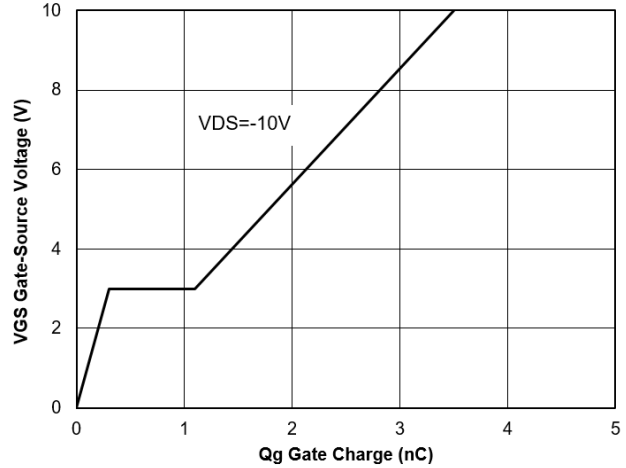


Figure 4. Gate Charge

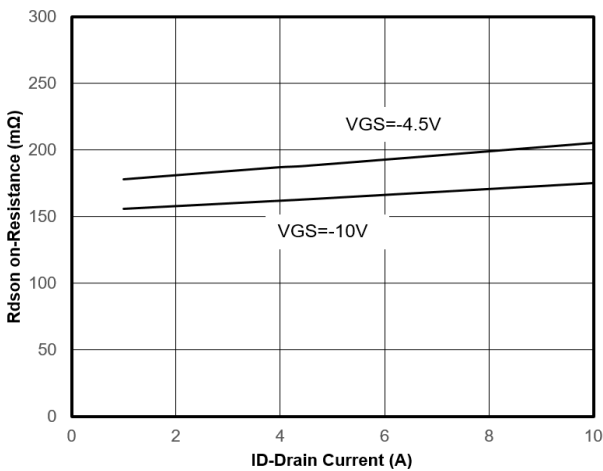


Figure 5. Drain-Source on Resistance

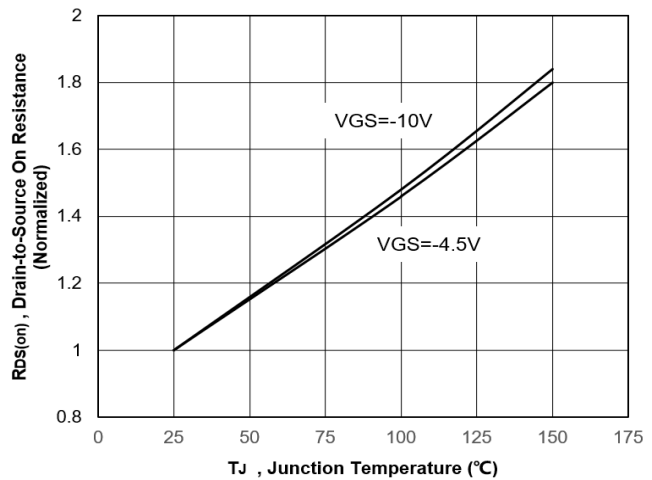


Figure 6. Normalized On-Resistance

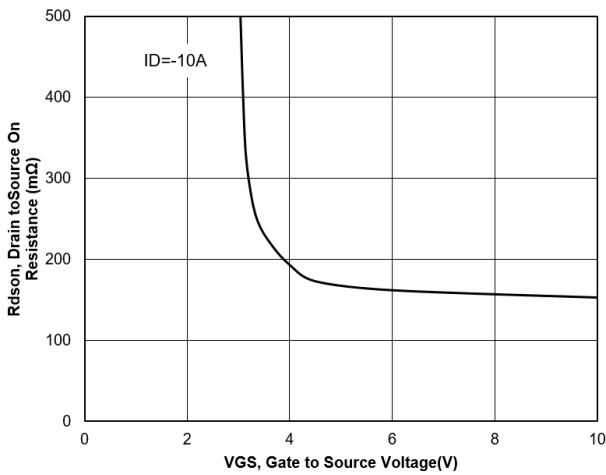


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

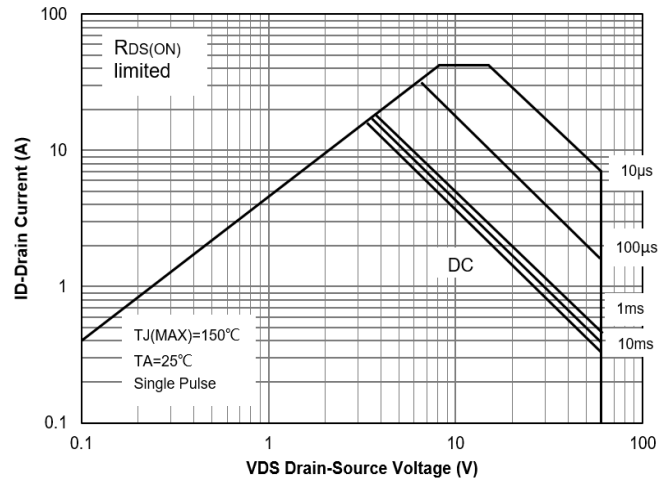


Figure 8. Safe Operation Area

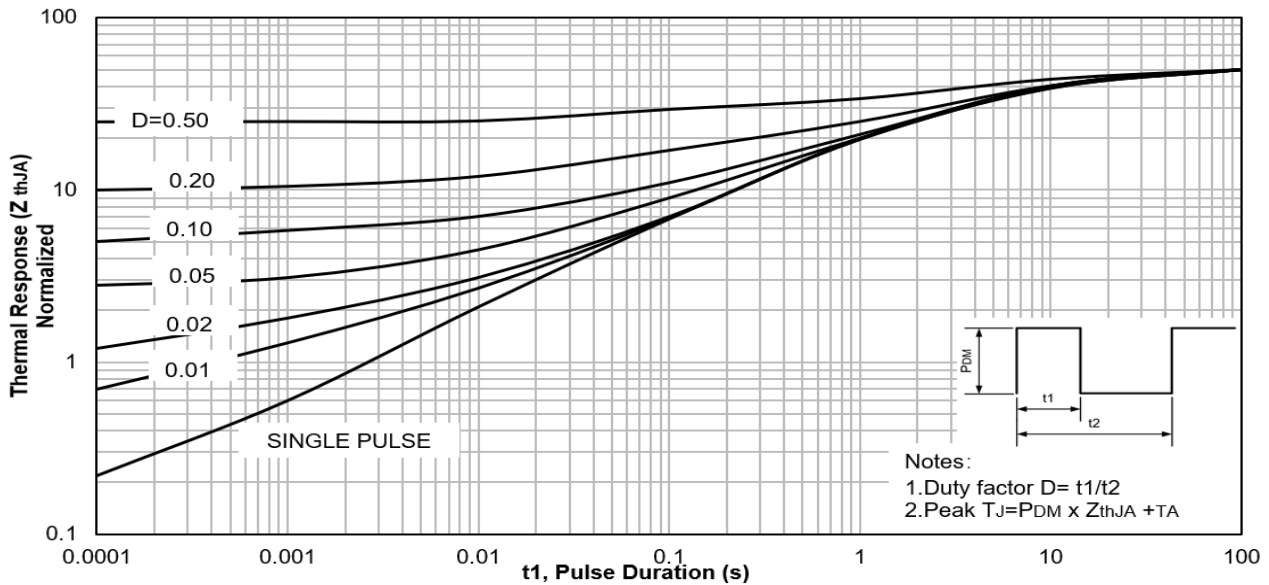


Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

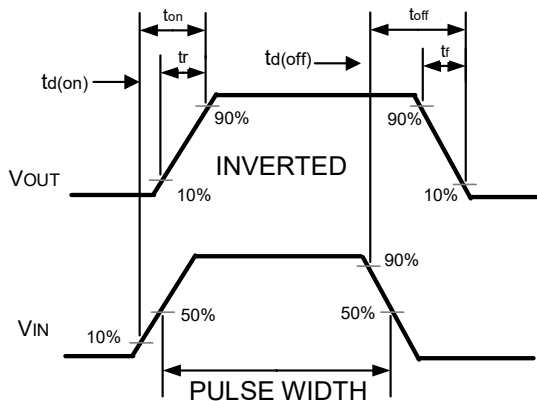
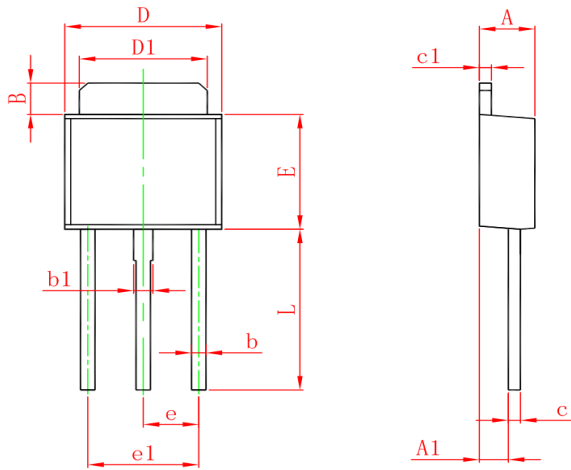


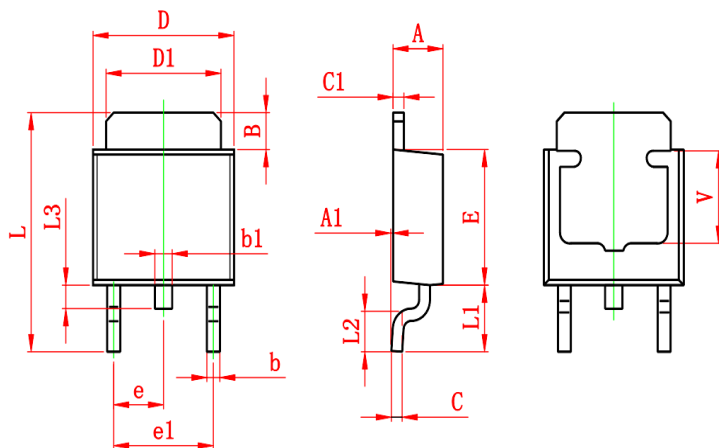
Figure 10. Switching wave

### TO-251 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

### TO-252 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	