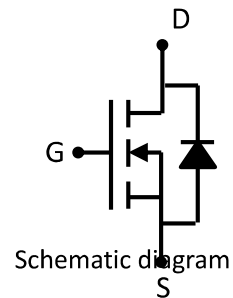


AP8290

N-Channel Enhancement Mosfet

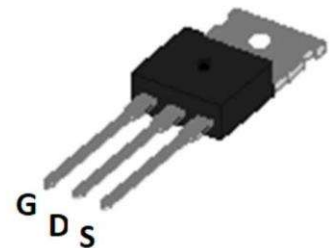
Feature

- 80V,80A
 $R_{DS(ON)} < 10m\Omega @ V_{GS}=10V$
- Advanced Trench Power MOSFET
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



TO-220C

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
08R070	AP8290	TO-220C		-	1000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a=25^{\circ}C$)	I_D	80	A
Continuous Drain Current ($T_a=100^{\circ}C$)	I_D	41.2	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	260	A
Singel Pulsed Avalanche Energy ⁽²⁾	E_{AS}	518	mJ
Power Dissipation	P_D	80	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.94	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

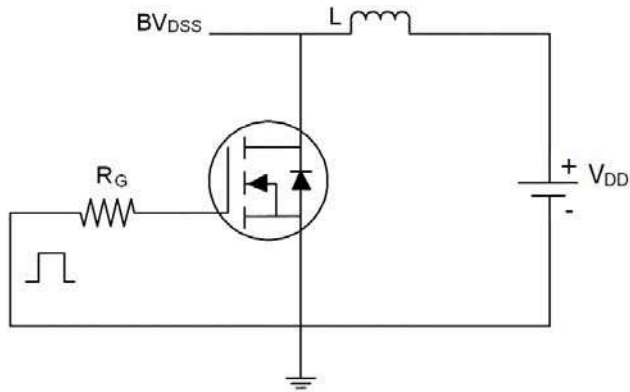
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	80	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$	-	8.5	10	m Ω
Forward tranconductance ⁽³⁾	g_{FS}	$V_{DS} = 40V, I_D = 40A$	-	20	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$	-	2940	-	pF
Output Capacitance	C_{oss}		-	680	-	
Reverse Transfer Capacitance	C_{rss}		-	85	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 40V, I_D = 80A,$ $V_{GS} = 10V, R_G = 25\Omega$	-	7.2	-	ns
Turn-on rise time	t_r		-	68	-	
Turn-off delay time	$t_{d(off)}$		-	77	-	
Turn-off fall time	t_f		-	93	-	
Total Gate Charge	Q_g	$V_{DS} = 30V, I_D = 30A,$ $V_{GS} = 10V$	-	94	-	nC
Gate-Source Charge	Q_{gs}		-	16	-	
Gate-Drain Charge	Q_{gd}		-	24	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = 40A$	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I_S		-	-	80	A

Notes:

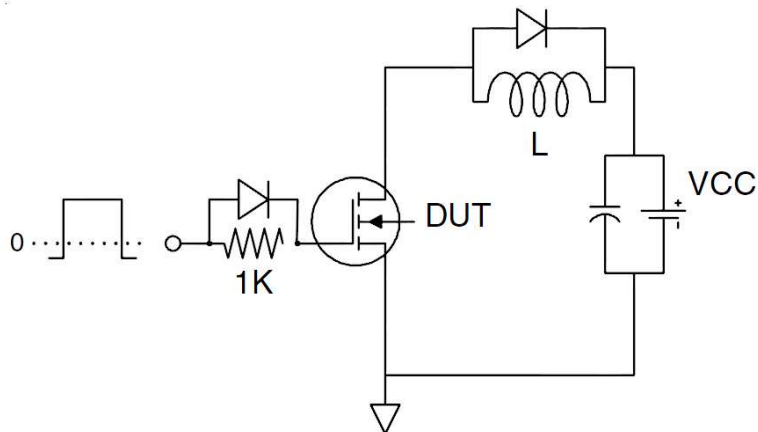
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 25V, R_G = 20\Omega, L = 0.5\text{mH}$
3. Pulse Test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10\text{ sec}$

Test Circuit

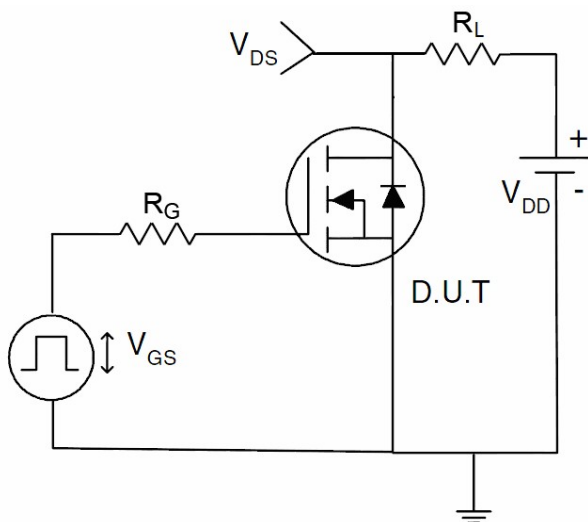
1) E_{AS} test circuit



2) Gate charge test circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (curves)

Figure1. Safe operating area

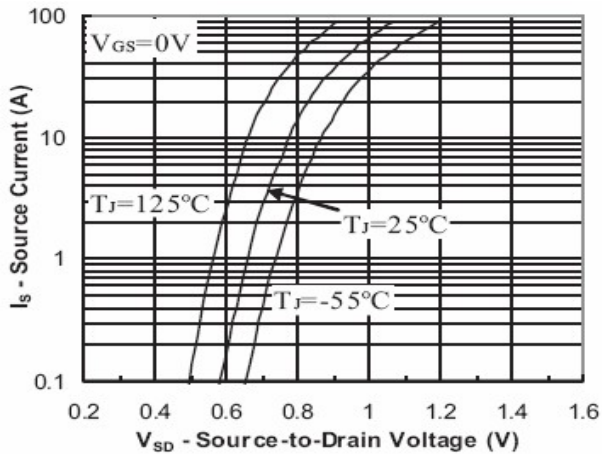


Figure2. Source-Drain Diode Forward Voltage

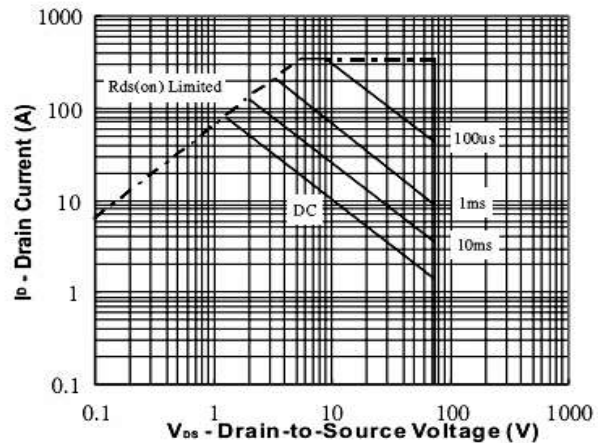


Figure3. Output characteristics

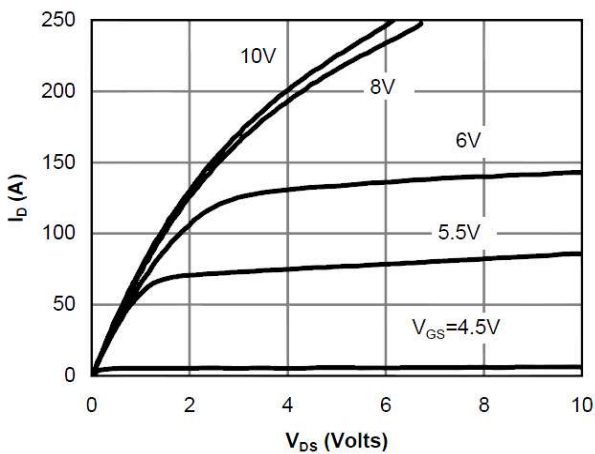


Figure4. Transfer characteristics

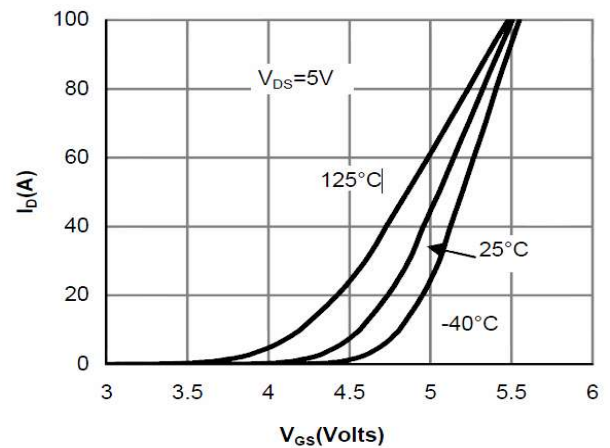


Figure5. Static drain-source on resistance

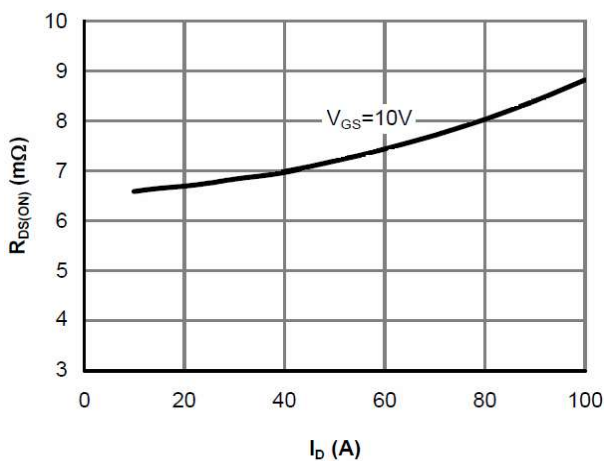


Figure6. RDS(ON) vs Junction Temperature

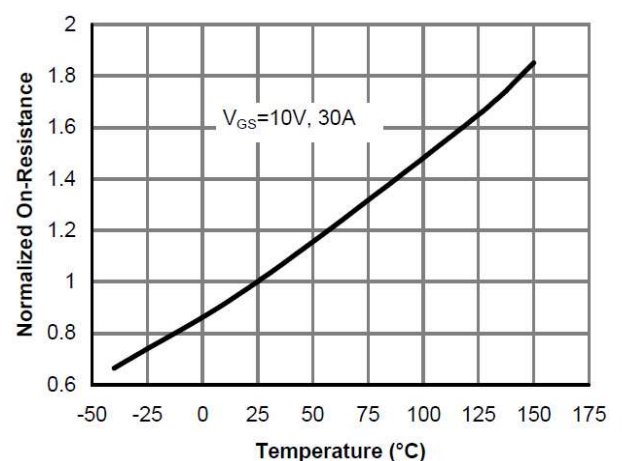


Figure7. BV_{DSS} vs Junction Temperature

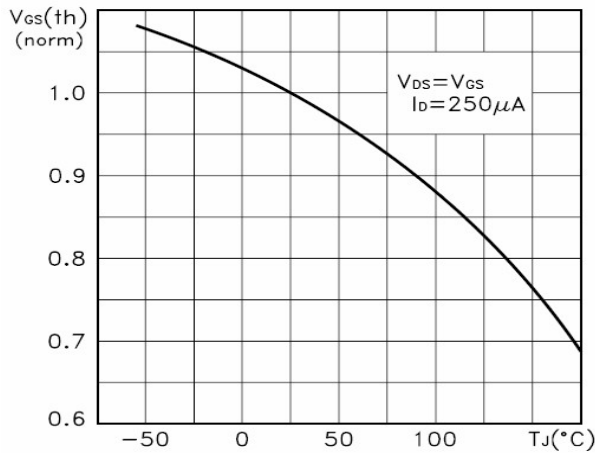


Figure8. $V_{GS(th)}$ vs Junction Temperature

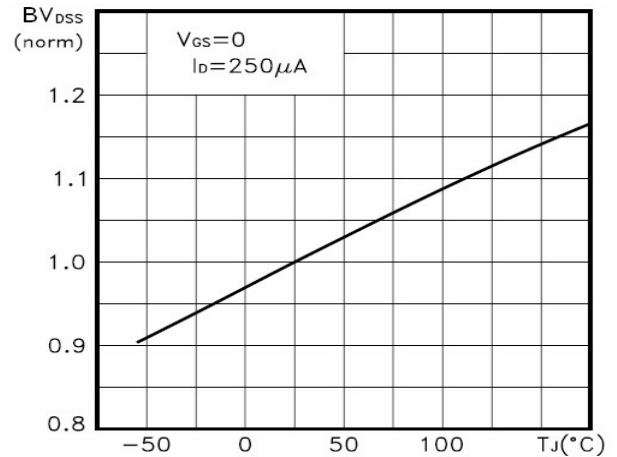


Figure9. Capacitance

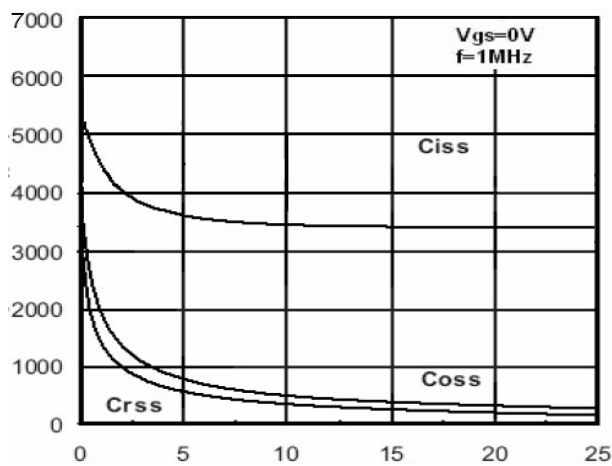


Figure10. Gate charge waveforms

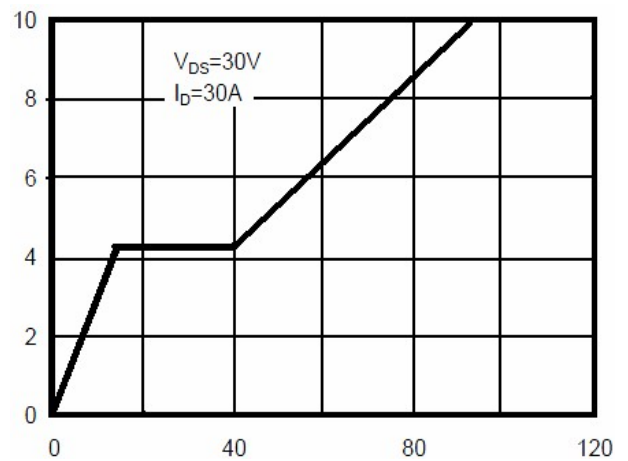
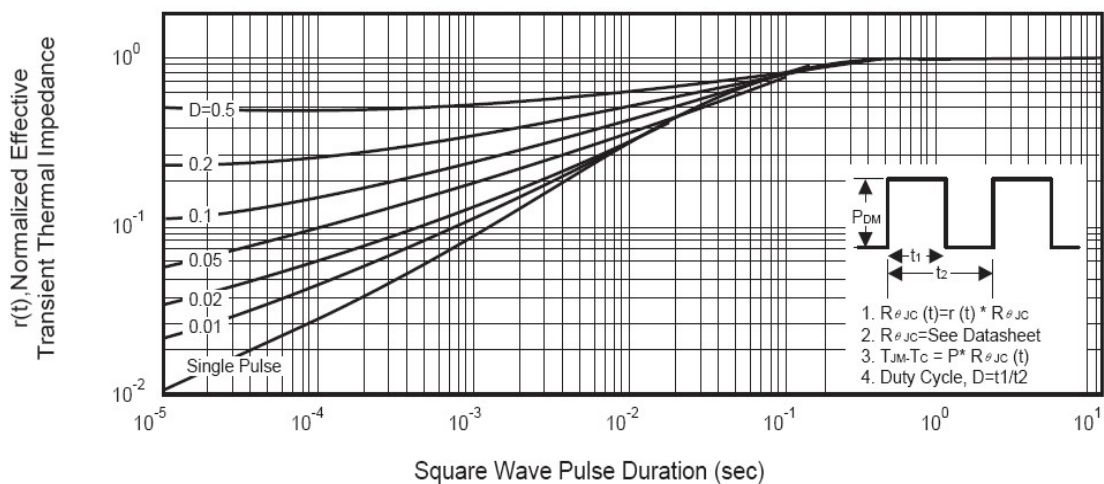
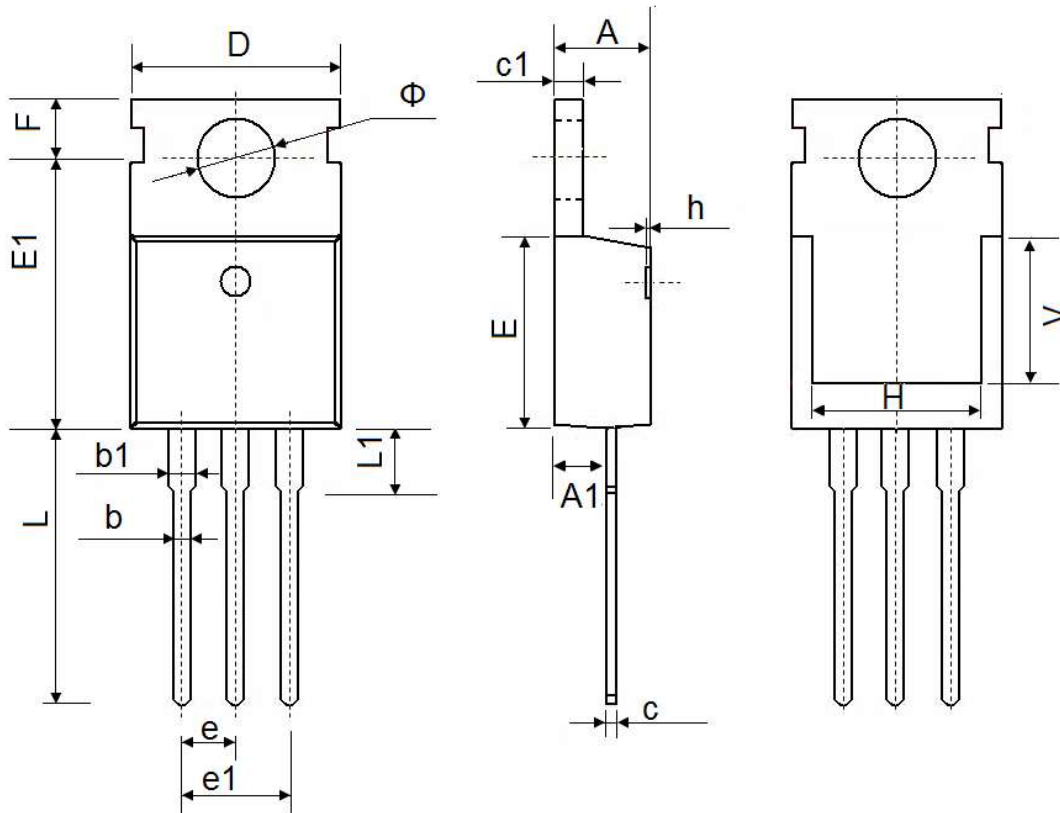


Figure11. Normalized Maximum Transient Thermal Impedance



TO220C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150