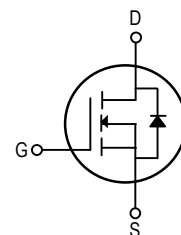




40V/80A N-Channel Advanced Power MOSFET

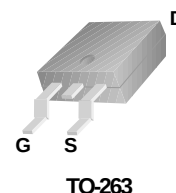
Features

- ◆ Low On-Resistance
- ◆ Fast Switching
- ◆ 100% Avalanche Tested
- ◆ Repetitive Avalanche Allowed up to T_{jmax}



Order Information

Product	Package	Marking	Packing
PTY4080	TO-263	PTY4080	50PCS/Tube 800PCS/REF



TO-263

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (T_a) is 25°C, unless otherwise specified.

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±20	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		40	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	80	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Silicon Limit)	T _C =25°C	320	A
I _D	Continuous Drain current@V _{GS} =10V (See Fig2)	T _C =25°C	80	A
P _D	Maximum Power Dissipation	T _C =25°C	58	W
R _{θJC}	Thermal Resistance-Junction to Case		1.98	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed ②		240	mJ



40V/80A N-Channel Advanced Power MOSFET

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(Tc=25°C)	V _{DS} =32V,V _{GS} =0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250μA	1.0	1.6	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance①	V _{GS} =10V, I _D =40A	--	4.8	6.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance①	V _{GS} =4.5V, I _D =10A	--	5.6	8.0	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =20V,V _{GS} =0V, f=1MHz	--	1400	--	pF
C _{oss}	Output Capacitance		--	190	--	pF
C _{rss}	Reverse Transfer Capacitance		--	150	--	pF
Q _g	Total Gate Charge	V _{DS} =20V,I _D =20A, V _{GS} =10V	--	37	--	nC
Q _{gs}	Gate-Source Charge		--	7	--	nC
Q _{gd}	Gate-Drain Charge		--	18	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =20V, I _D =10A, R _G =4.7Ω, V _{GS} =10V	--	16	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	20	--	nS
t _f	Turn-Off Fall Time		--	12	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	80	A
V _{SD}	Forward on voltage	I _S =20A,V _{GS} =0V	--	--	1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C,I _{sd} =20A, V _{GS} =0V	--	29	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs		16	--	nC

Note:

① Pulse width ≤ 300μs; duty cycles ≤ 2%.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 40A, V_{GS} = 10V. Part not recommended for use above this value

③ Repetitive rating; pulse width limited by max. junction temperature.



40V/80A N-Channel Advanced Power MOSFET

Typical Characteristics

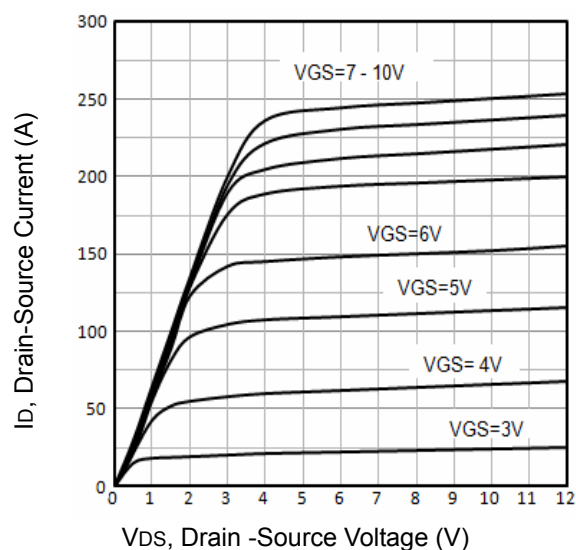


Fig1. Typical Output Characteristics

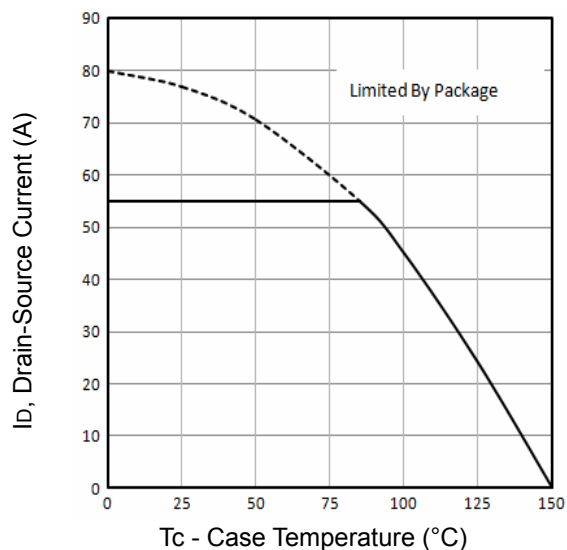


Fig2. Maximum Drain Current Vs. Case Temperature

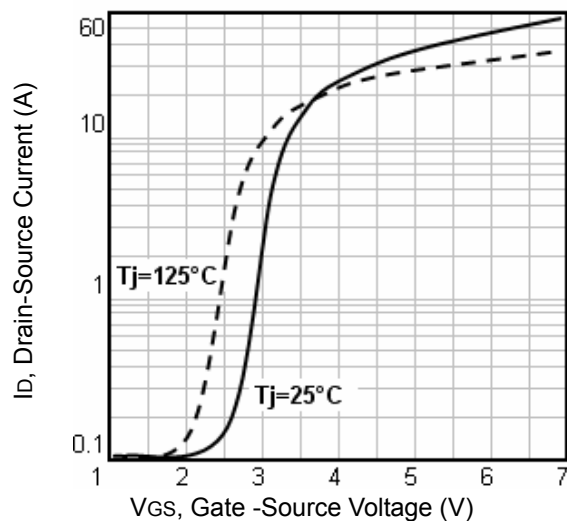


Fig3. Typical Transfer Characteristics

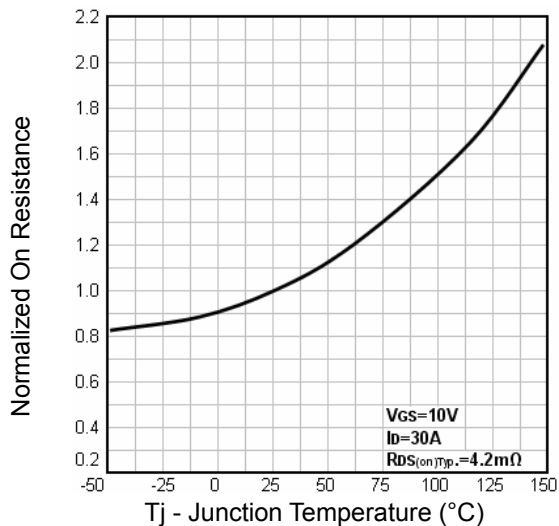


Fig4. Normalized On-Resistance Vs. Temperature

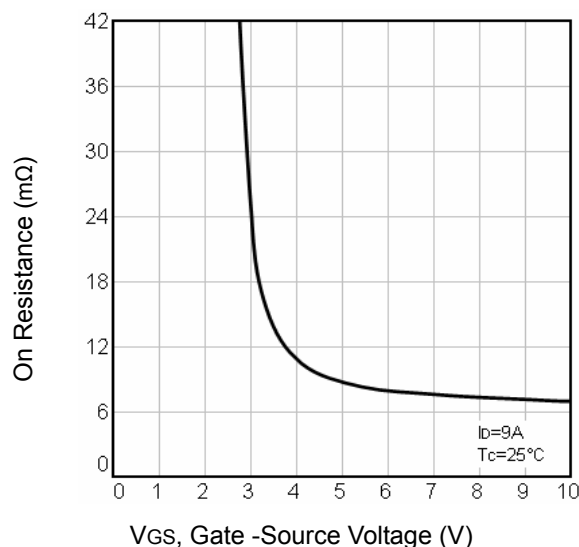


Fig5. On Resistance Vs. Gate-Source Voltage

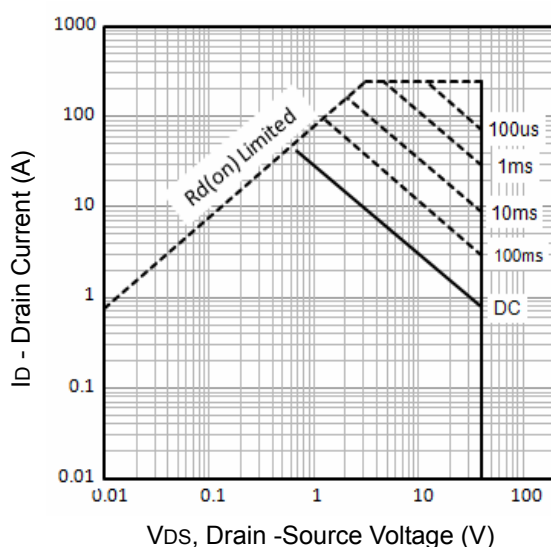


Fig6. Maximum Safe Operating Area



Typical Characteristics

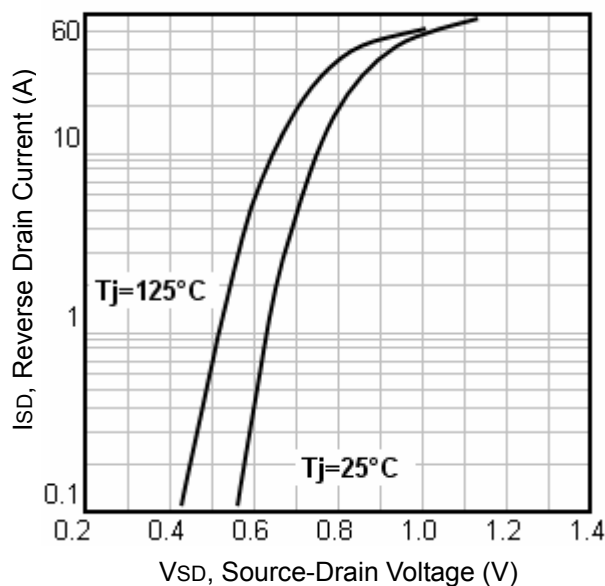


Fig7. Typical Source-Drain Diode Forward Voltage

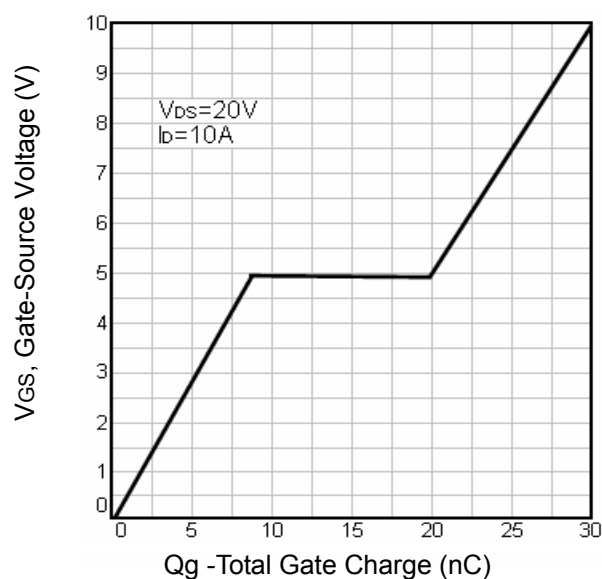


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

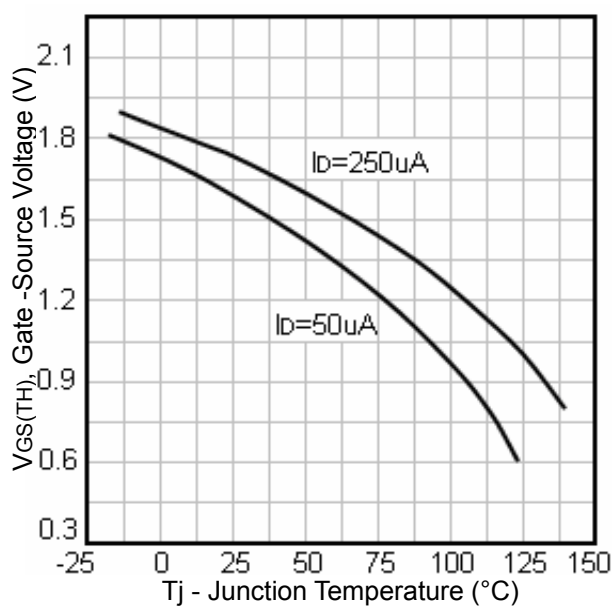


Fig9. Threshold Voltage Vs. Temperature

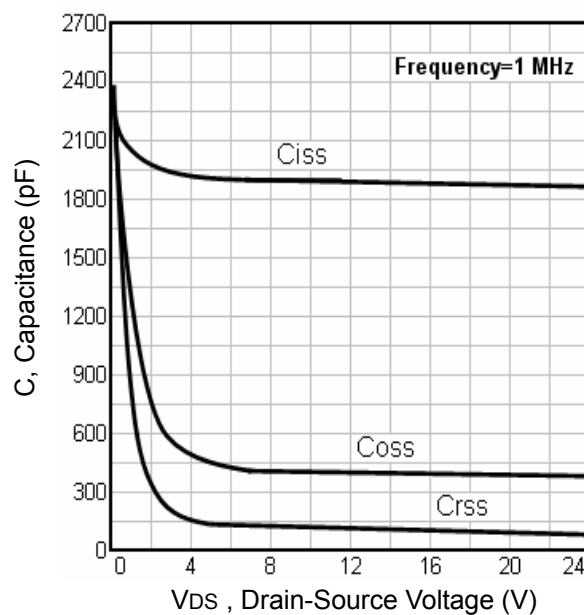


Fig10. Typical Capacitance Vs. Drain-Source Voltage

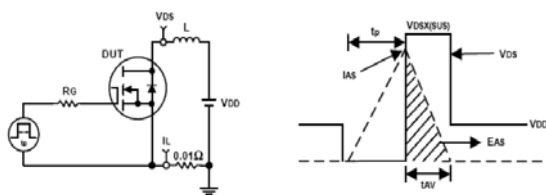


Fig11. Unclamped Inductive Test Circuit and waveforms

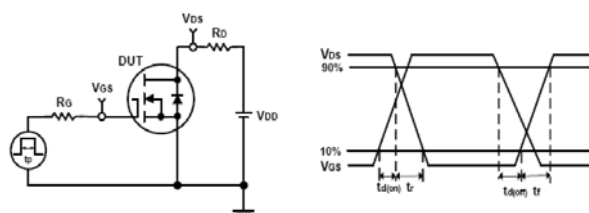
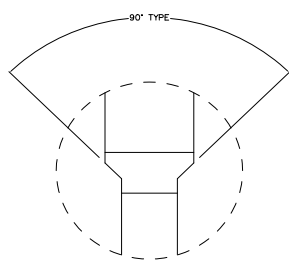


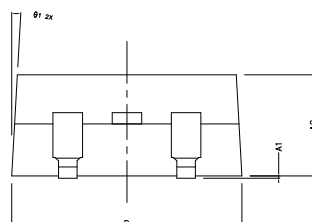
Fig12. Switching Time Test Circuit and waveforms



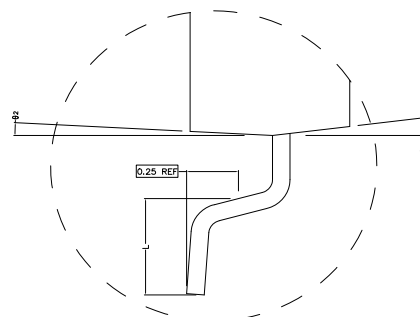
TO-263 Package Outline Dimensions (Units: mm)



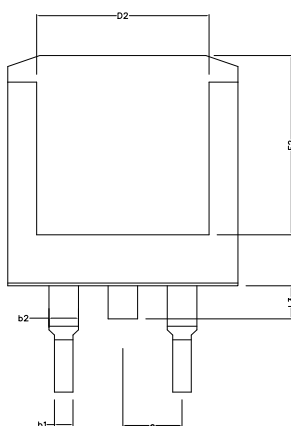
DETAIL F



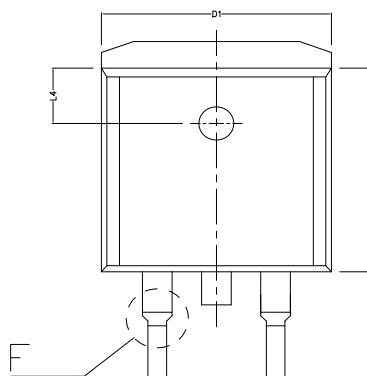
SIDE VIEW



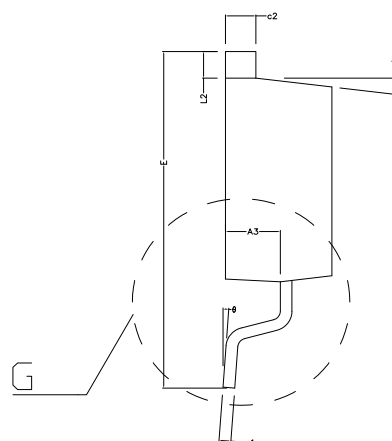
DETAIL G



BOTTOM VIEW



TOP VIEW



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.020	0.100	0.200
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2	1.220	1.270	1.320
c1	0.450	0.500	0.550
c2	1.250	1.300	1.350
D	9.900	10.000	10.100
D1	9.880REF		
D2	7.400REF		
E	14.900	15.100	15.300
E1	9.000	9.100	9.200
E2	8.100REF		
e	2.540TYPE		
L	2.100	2.300	2.500
L2	1.100	1.200	1.300
L3	1.300	1.500	1.700
L4	2.50 TYPE		
θ1	3° TYPE		
θ2	3° TYPE		
θ3	7° TYPE		
θ4	7° TYPE		
θ	0 ~ 8°		