

APP540

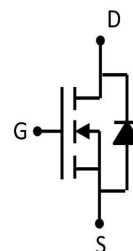
N-Channel Enhancement Mosfet

Features

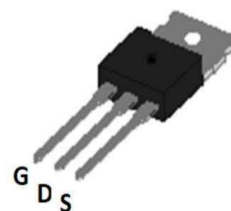
- $V_{DS}=100V, I_D=33A$
- $R_{DS(ON)} < 40m\Omega$
@ $V_{GS}=10V, I_D=16A$ TYP: $36.2m\Omega$

Applications

- Power factor correction(PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply(UPS)
- LED



Schematic Diagram



TO-220

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
P540	APP540	TO-220	-	-	1000

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}C$	I_D	33	A
	$T_C = 100^{\circ}C$		23	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	110	A
Single Pulsed Avalanche Energy ⁽²⁾		E_{AS}	506.25	mJ
Power Dissipation		P_D	130	W
Thermal Resistance from Junction to Case ⁽¹⁾		$R_{\theta JC}$	0.98	$^{\circ}C/W$
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$	62.5	$^{\circ}C/W$
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 =250μA	100	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	100	nA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	2.8	4.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =16A	-	36.2	40	mΩ
Dynamic characteristics						
Gate Resistance	R _g	V _{GS} =0V, f =1.0MHz	1	1.81	10	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =1.0MHz	-	1700	-	pF
Output Capacitance	C _{oss}		-	210	-	
Reverse Transfer Capacitance	C _{rss}		-	25	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =50V, I _D =16A, V _{GS} =10V ,R _G =5.1Ω	-	9.8	-	ns
Turn-on rise time ^(3,4)	t _r		-	39.6	-	
Turn-off delay time	t _{d(off)}		-	46.1	-	
Turn-off fall time	t _f		-	10.1	-	
Total Gate Charge ^(3,4)	Q _g	V _{DS} =80V, I _D =16A, V _{GS} =10V	-	33.1	-	nC
Gate-Source Charge ^(3,4)	Q _{gs}		-	6.1	-	
Gate-Drain Charge ^(3,4)	Q _{gd}		-	14.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽²⁾	V _{SD}	T _J =25℃, V _{GS} =0V, I _S =50A	-	0.85	1.3	V
Diode Forward current	I _S	T _C =25℃	-	-	33	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25℃, IF=50A,di/dt=100A/us		102		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J =25℃, IF=50A,di/dt=100A/us		1.1		uc

Notes:

1. Pulse width limited by maximum junction temperature
2. $L = 10mH, I_{AS} = 9A, V_{DD} = 80V, V_G = 10V, R_G = 25\Omega$ starting $T_J = 25^{\circ}\text{C}$
3. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Essentially independent of operating temperature

Typical Performance Characteristics

Figure 1. On-Region Characteristics

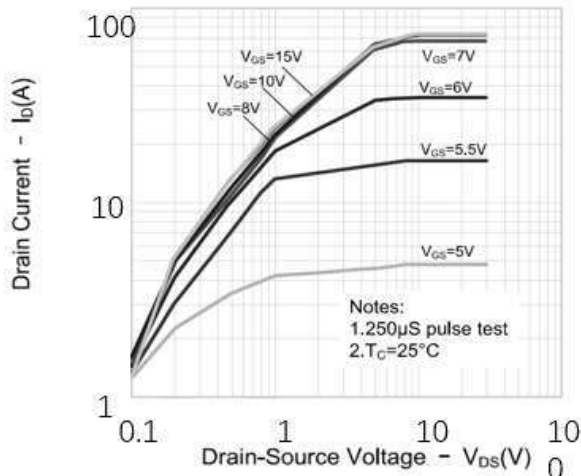


Figure 2. Transfer Characteristics

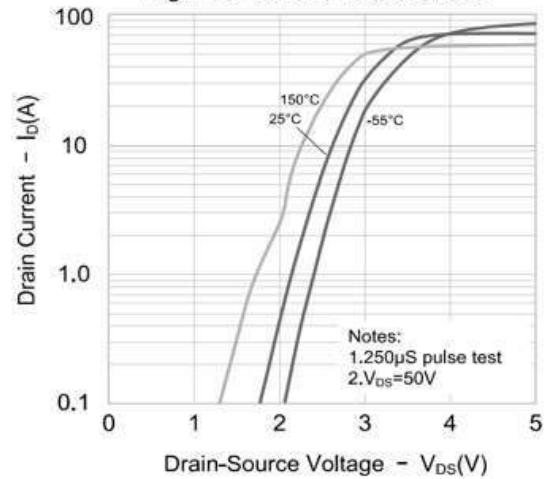


Figure 3. On-Resistance variation vs Drain-Current, Gate Voltage

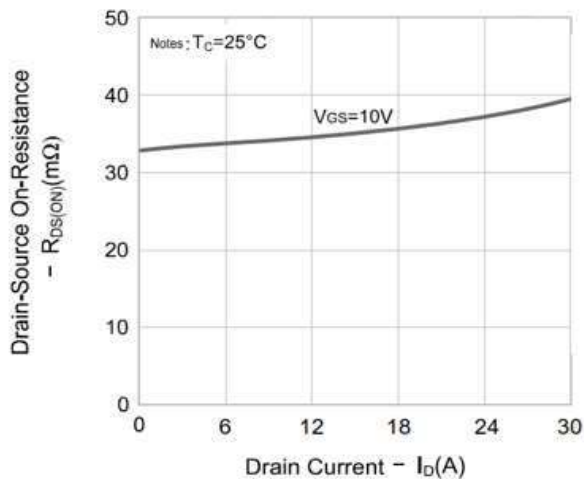


Figure 4. Source Drain Diode Forward Voltage Variation vs. Source Current and Temperature

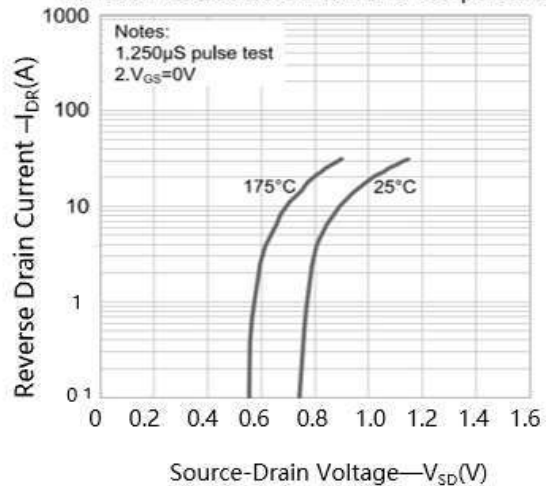


Figure 5. Capacitance Characteristics

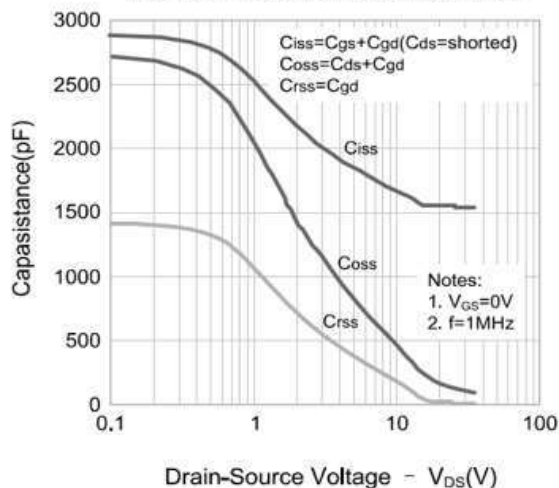
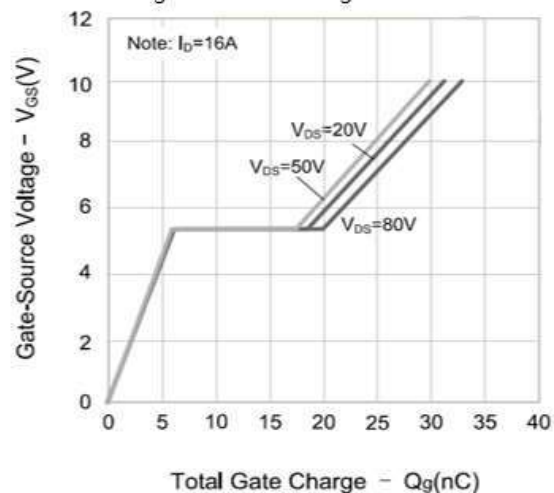


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics

Figure 7. On-resistance Variation vs. Temperature

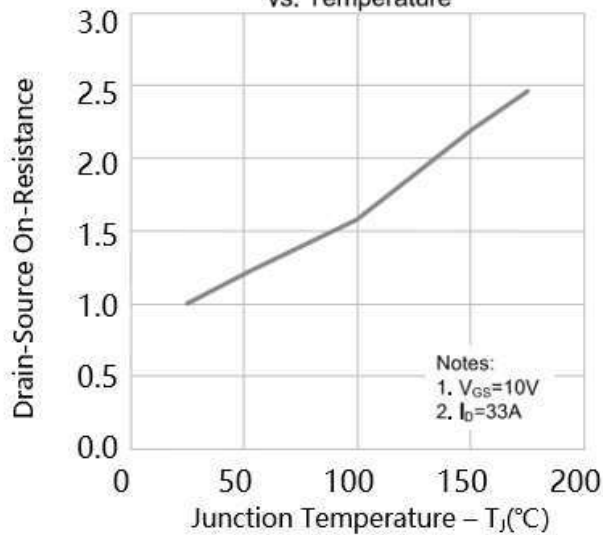


Figure 8. Max Safe Operating Area

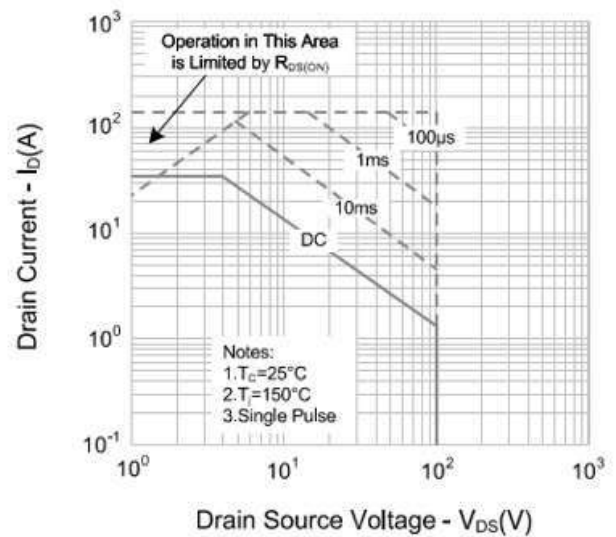
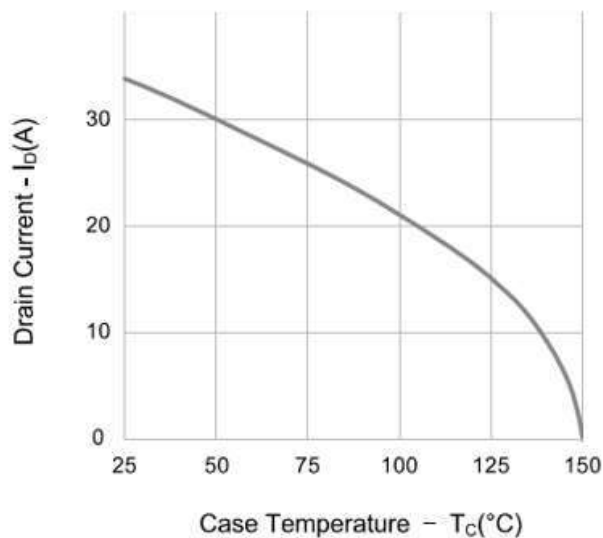
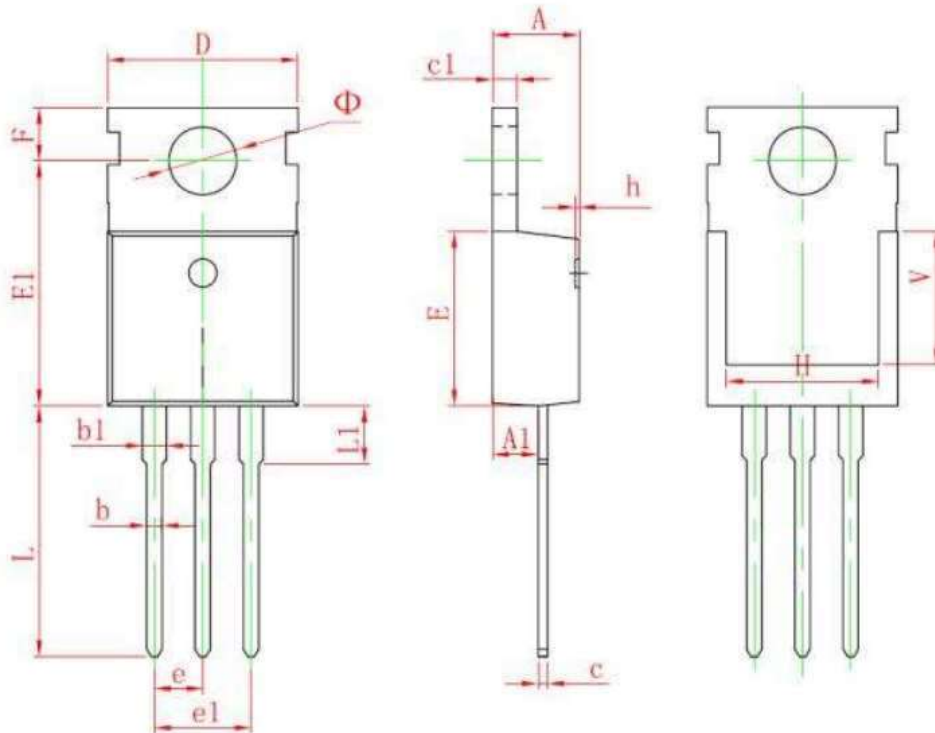


Figure 9. Maximum Drain Current vs Case Temperature



T0-220 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	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
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	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150