
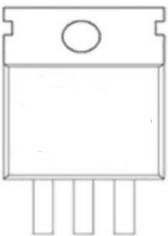
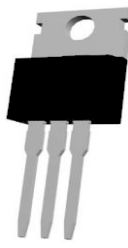
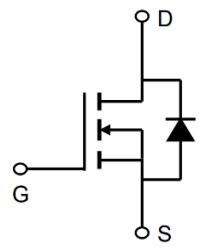




## TMG100N04P

## N-Channel Enhancement Mosfet

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = 40V</math> <math>I_D = 100A</math>  <math>R_{DS(ON)} = 3.1m\Omega</math> (typ.) @ <math>V_{GS} = 10V</math></p> <p>100% UIS Tested  100% <math>R_g</math> Tested</p> 
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 Marking: G100N04	P:TO-220AB  G D S	
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**Absolute Maximum Ratings:** ( $T_C = 25^\circ C$  unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C = 25^\circ C$	100	A
	Continuous Drain Current- $T_C = 125^\circ C$	65	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	370	A
$I_{AR}$	Avalanche Current, Repetitive <sup>2</sup>	20	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>3</sup>	170	mJ
$P_D$	Power Dissipation	89	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

**Thermal Characteristics:**

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to ambient	50	$^\circ C/W$



## TMG100N04P

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Electrical Characteristics: ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	40	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.2	1.8	2.4	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=35A$	---	3.1	3.5	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$	---	4.3	5	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	2900	---	pF
$C_{oss}$	Output Capacitance		---	758	---	
$C_{rss}$	Reverse Transfer Capacitance		---	50	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=1.6\ \Omega, I_D=35A$	---	9	---	ns
$t_r$	Rise Time		---	32	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	32	---	ns
$t_f$	Fall Time		---	7	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V, I_D=35A$	---	6.1	---	nC
$Q_{gs}$	Gate-Source Charge		---	4.7	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	40	---	nC
<b>Drain-Source Diode Characteristics</b>						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>3</sup>	$V_{GS}=0V, I_S=35A$	---	0.84	---	V
$t_{rr}$	Continuous Source Current	$V_R=20V, I_F=35A, dI_F/dt=100A/\mu\text{s}$	---	52	---	ns
$q_{rr}$	Pulsed Source Current		---	91	---	nC

**Notes:**

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3.  $I_{AS}=20.0A, V_{DD}=20V, R_G=25\ \Omega$ , Starting  $T_J=25^\circ\text{C}$

**TMG100N04P**

**N-Channel Enhancement Mosfet**

Typical Characteristics: ( $T_C=25^\circ\text{C}$  unless otherwise noted)

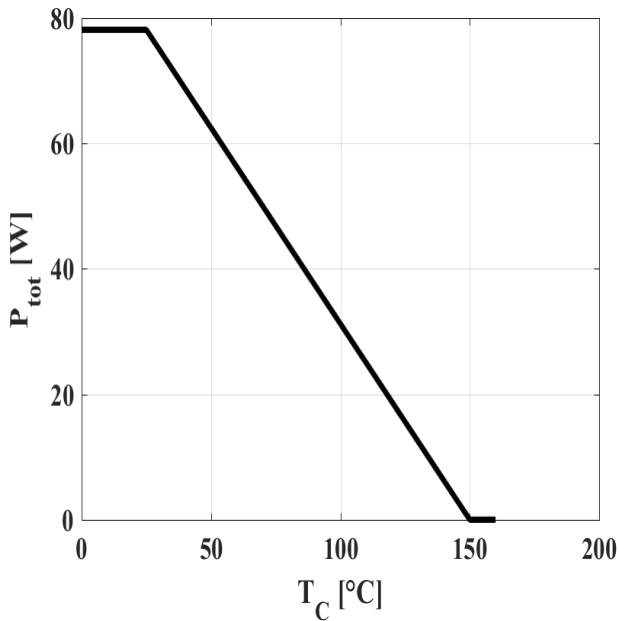


Figure 1: Power Dissipation

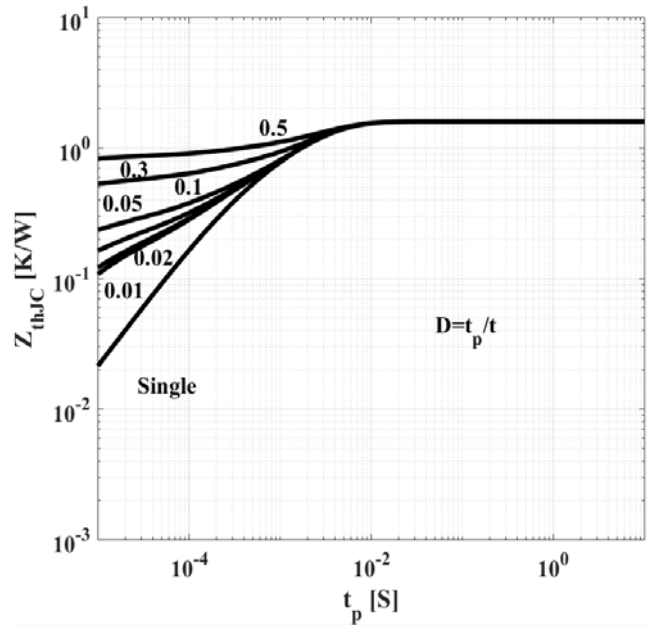


Figure 2: Max. Transient Thermal Impedance

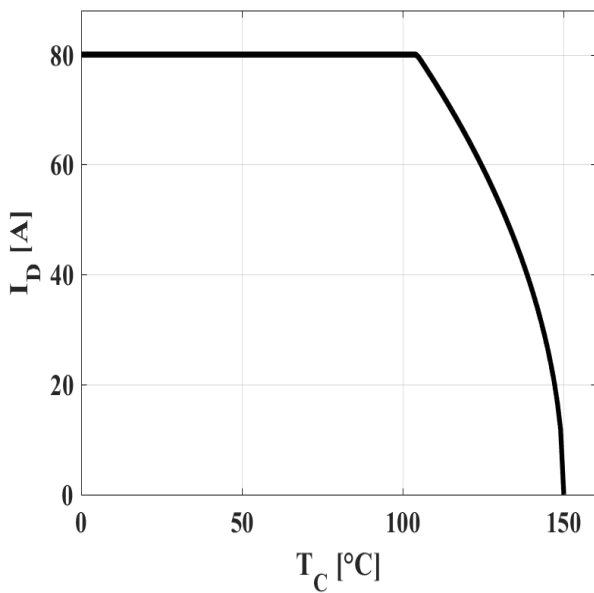


Figure3: Drain Current

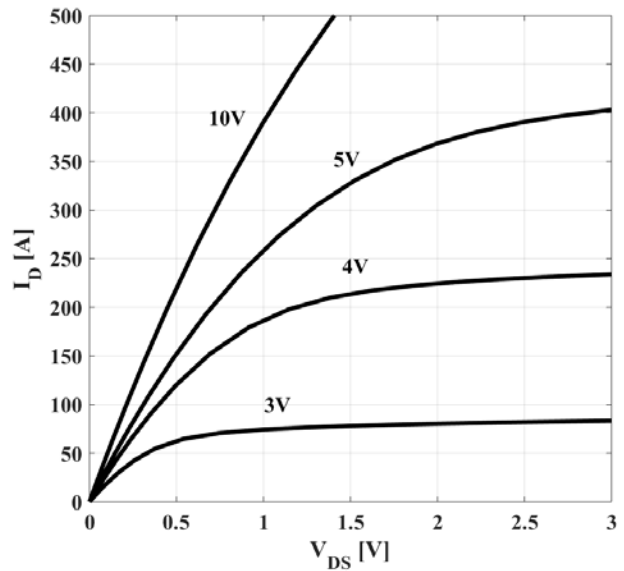


Figure4: Typ. Output Characteristics



# TMG100N04P

## N-Channel Enhancement Mosfet

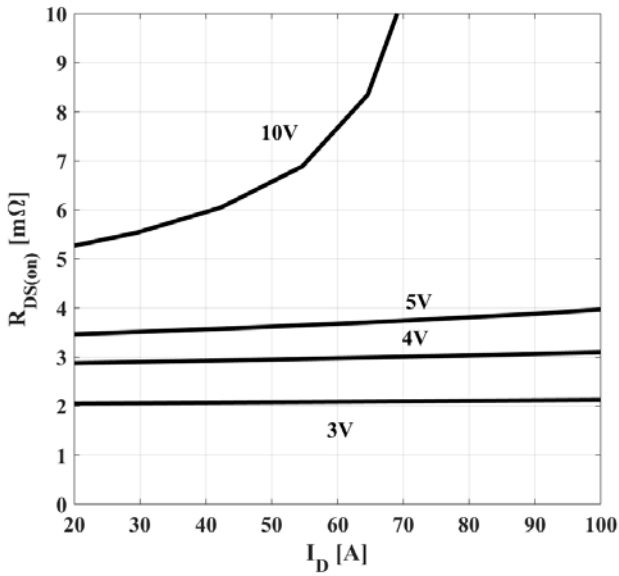


Figure5: Typ. Drain-Source On-State Resistance

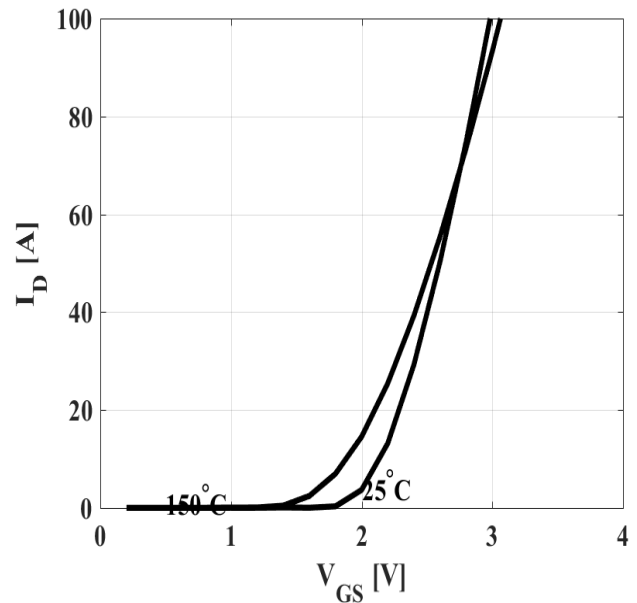


Figure6: Typ. Transfer Characteristics

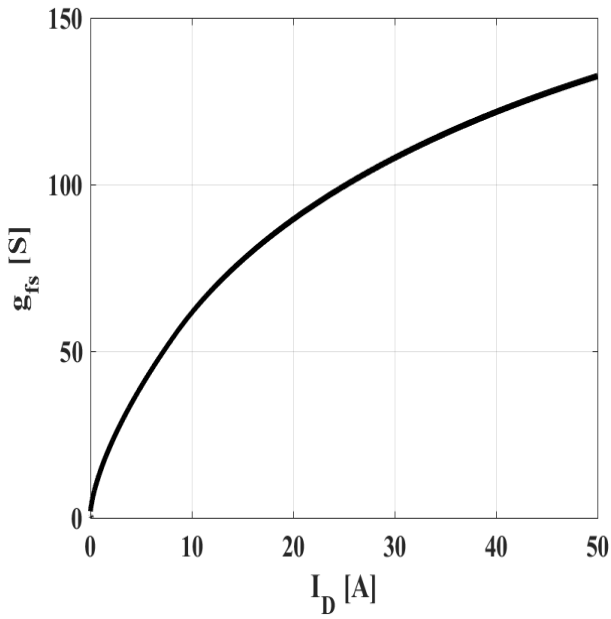


Figure7: Typ. Forward Transconductance

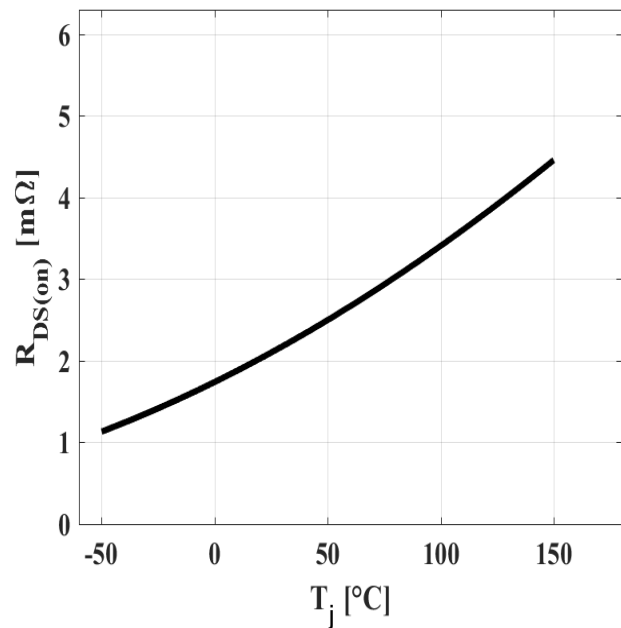


Figure8: Typ. Drain-Source On-State Resistance



TMG100N04P

N-Channel Enhancement Mosfet

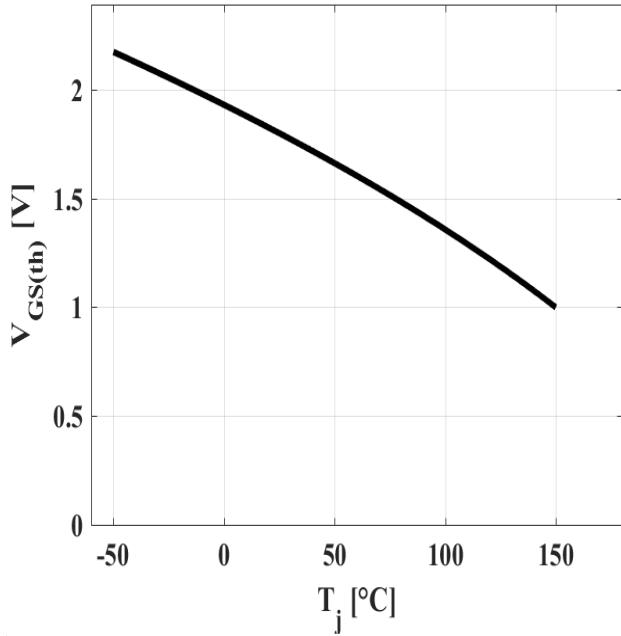


Figure 9: Typ. Gate Threshold Voltage

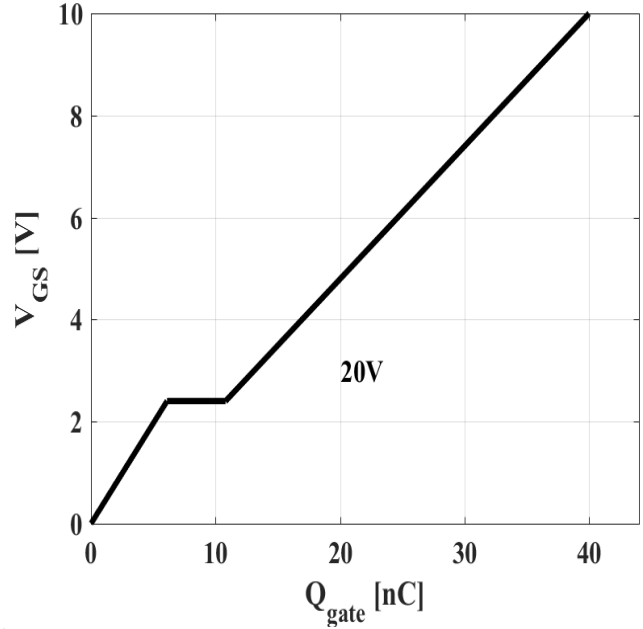


Figure 10: Typ. Gate Charge

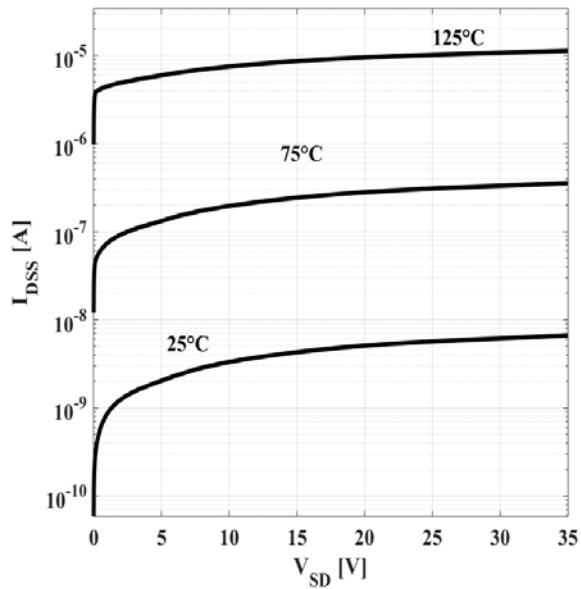


Figure 11: Drain-Source Leakage Current

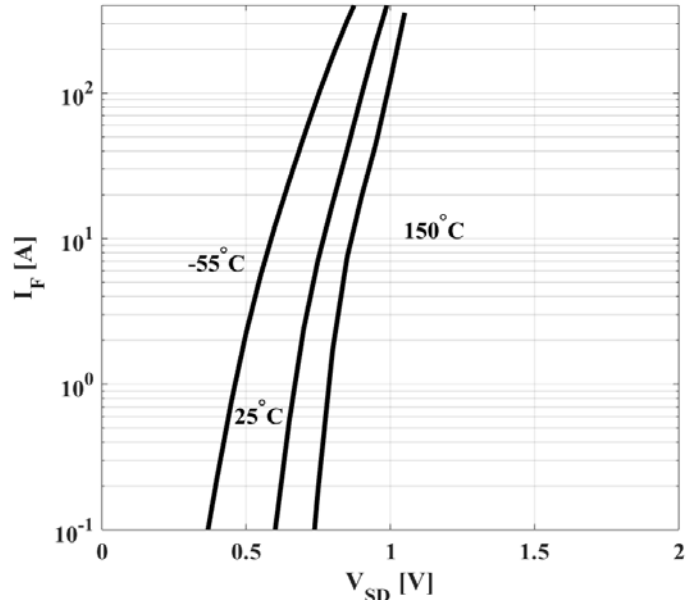


Figure 12: Forward Characteristics of Reverse Diode



# TMG100N04P

## N-Channel Enhancement Mosfet

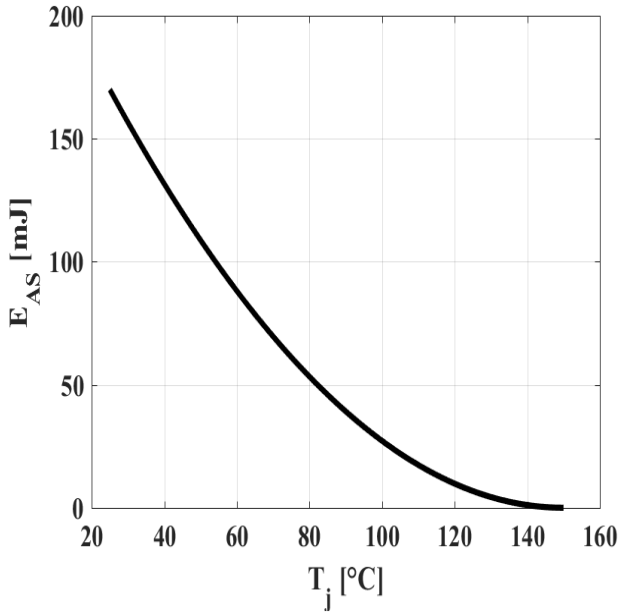


Figure 13: Avalanche Energy

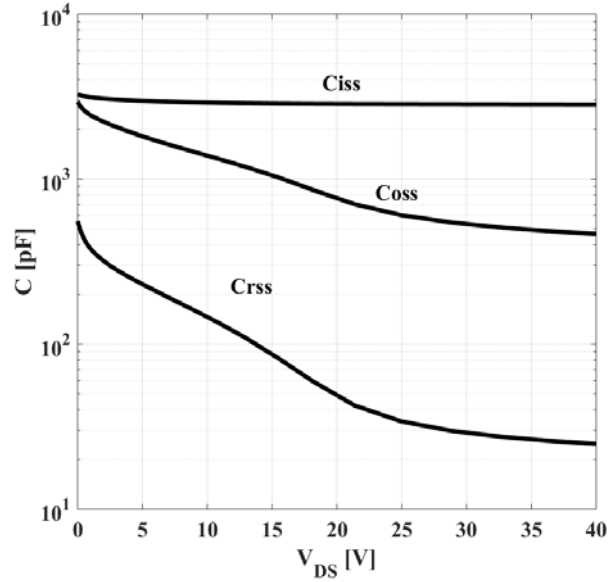


Figure 14: Typ. Capacitances

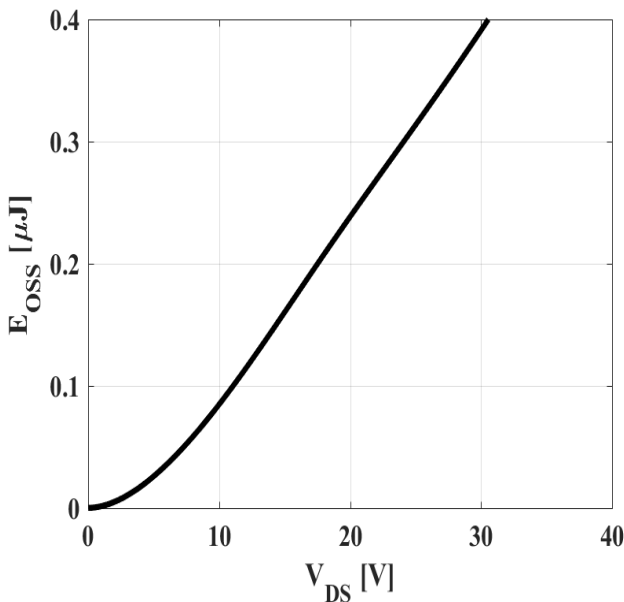
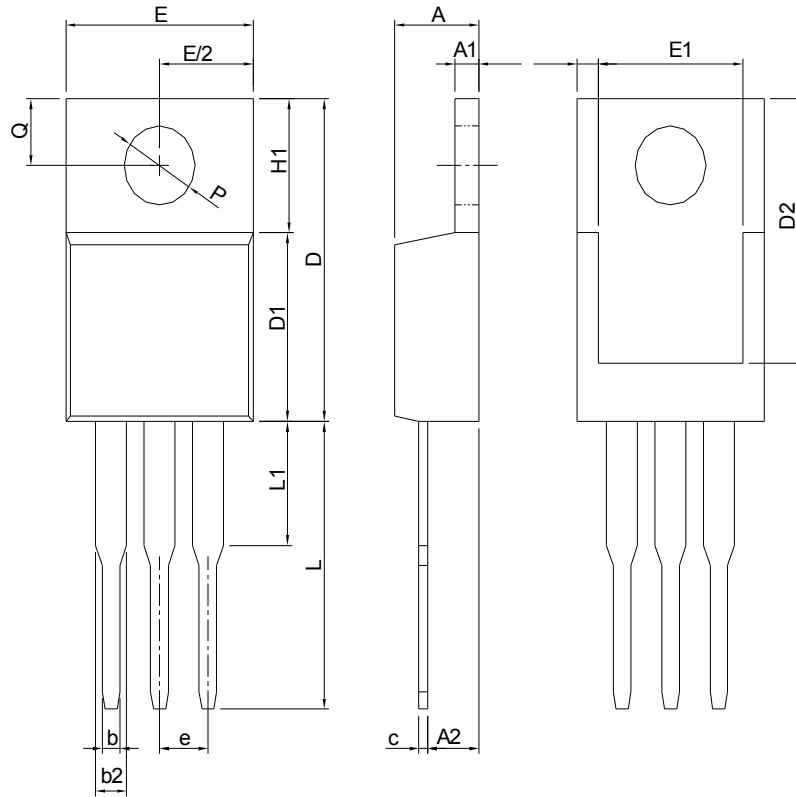


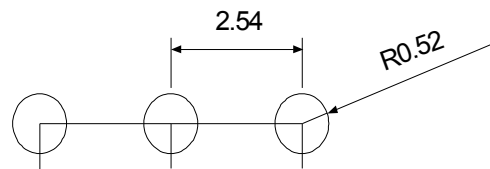
Figure 15:  $C_{oss}$  Stored Energy

# Package Information: TO-220AB



DIMENSIONS	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

## RECOMMENDED LAND PATTERN



UNIT: mm

Note: Follow JEDEC TO-220 AB.